

xSeries 336 Type 1879 and Type 8837



Hardware Maintenance Manual and Troubleshooting Guide

xSeries 336 Type 1879 and Type 8837



Hardware Maintenance Manual and Troubleshooting Guide

Notes:

- Before using this information and the product it supports, read Appendix B, "Safety information," on page 129, and Appendix C, "Notices," on page 163.
- **The most recent version of this document is available at <http://www.ibm.com/support/>.**

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About this manual

This document contains basic configuration information, diagnostic information, error codes, error messages, service information, and a symptom-to-FRU index for the IBM® xSeries® 336 Type 1879 and Type 8837 server.

Important: The field replaceable unit (FRU) procedures in this document are intended for trained servicers who are familiar with IBM products. Customer replacement units (CRUs) can be replaced by the customer. See Chapter 7, “Parts listing, Type 1879 and Type 8837,” on page 121, to determine if the component being replaced is a FRU or a CRU. Before servicing an IBM product, be sure to read Appendix B, “Safety information,” on page 129.

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/support/>. For a list of supported options for the server, go to <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

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Chapter 1. General information

This *Hardware Maintenance Manual and Troubleshooting Guide* contains information about servicing the IBM 336 server, Type 1879 and Type 8837.

The server might have features that are not described in the documentation that was received with the server. The documentation might be updated occasionally to include information about those features, or technical updates might be available to provide additional information that is not included in the server documentation. These updates are available from the IBM Web site at <http://www.ibm.com/support/>.

The xSeries 336 server is a 1-U server. Racks are marked in vertical increments of 1.75 inches; each increment is referred to as a unit, or "U." A 1-U-high device is 1.75 inches tall.

The model number and serial number are on the ID label, which is on the front of the server on the lower-right corner, as shown in Figure 1.

Notes:

1. The illustrations in this document might differ slightly from the hardware.
2. Figure 1 shows a 2.5-inch SCSI hot-swap hard disk drive model. There is also a 3.5-inch hard disk drive model that is available with either a SCSI hot-swap or SATA simple-swap configuration. This illustration might differ slightly from your hardware.

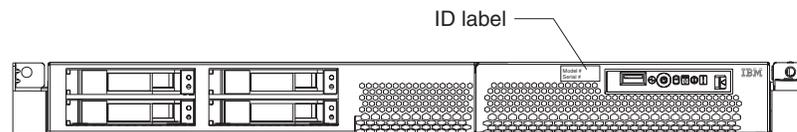


Figure 1. Serial number location (model with SCSI hot-swap hard disk drive)

Related documentation

This *Hardware Maintenance Manual and Troubleshooting Guide* is provided in Portable Document Format (PDF) on the IBM *xSeries® Documentation CD*. It contains information to help you solve the problem yourself or to provide helpful information to a service technician.

In addition to this *Hardware Maintenance Manual and Troubleshooting Guide*, the following xSeries 336 Type 1879 and Type 8837 documentation is provided with the server:

- *User's Guide*
The *User's Guide* is provided in PDF on the IBM *xSeries Documentation CD* and contains general information about the server.
- *Installation Guide*
This printed document contains instructions for setting up the server and basic instructions for installing some options.
- *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.

- *Safety Book*
This multilingual document is provided in PDF on the IBM *xSeries Documentation* CD. It contains translated versions of the caution and danger statements that appear in the documentation for the server. Each caution and danger statement has an assigned number, which you can use to locate the corresponding statement in your native language.
- *Rack Installation Instructions*
This printed document contains the instructions for installing the server in a rack.

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

Notices and statements used in this book

The caution and danger statements used in this book also appear in the multilingual *Safety Book* provided on the IBM *xSeries Documentation* CD. Each caution and danger statement is numbered for easy reference to the corresponding statements in the safety book.

The following types of notices and statements are used in this book:

- **Note:** 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 possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These 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

This table provides a summary of the features and specifications for the server. Depending on the server model, some features might not be available, or some specifications might not apply.

Note: You can use the Configuration/Setup Utility program in the server to determine the specific type of microprocessor on the system board.

<p>Microprocessor:</p> <ul style="list-style-type: none"> • Intel® Xeon® 2.8 GHz or higher depending on server model • Support for up to two microprocessors with Intel Hyper-Threading Technology and EM64T (extended memory 64 bit technology) • 800 MHz front-side bus (FSB) <p>Memory:</p> <ul style="list-style-type: none"> • Minimum: 512 MB • Maximum: 16 GB • Type: 2-way interleaved PC3200, 400 MHz, ECC DDR II SDRAM, registered DIMMs only • Sizes: 256 MB, 512 MB, 1 GB, 2 GB (when available) <p>Drives:</p> <ul style="list-style-type: none"> • DVD-ROM drive (available only with 3.5-inch hard disk drive solution) <p>Expansion bays:</p> <p>Comes in 3 configurations:</p> <ul style="list-style-type: none"> • Configuration 1 and 2 <ul style="list-style-type: none"> – One 9.5-mm high DVD-ROM drive (optional) – Two 3.5-inch slim hot-swap SCSI or two 3.5-inch simple-swap SATA hard disk drives • Configuration 3 <ul style="list-style-type: none"> – Four 2.5-inch hot-swap SCSI hard disk drives <p>Expansion slots:</p> <ul style="list-style-type: none"> • One PCI-X 133 MHz or PCI-E x8, full-length, full height <p>Note: PCI-E x8 (PCI-E) requires an optional riser card)</p> • One PCI-X 100 MHz, half length, low-profile 	<p>Power supply:</p> <ul style="list-style-type: none"> • 585 watt hot-swap power supply standard • Optional redundant 585 watt power supply <p>Integrated functions:</p> <ul style="list-style-type: none"> • Baseboard management controller (BMC) • One LSI Ultra320 SCSI controller with RAID level 1 capability • Two Broadcom 10/100/1000 Ethernet controllers with Wake on LAN® feature and Alert Standard Format support • Three Universal Serial Bus (USB) ports • One serial port • Keyboard port • Mouse port • Video port <p>Acoustical noise emissions:</p> <ul style="list-style-type: none"> • Sound power, idling: 6.9 bel maximum • Sound power, operating: 6.9 bel maximum <p>Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Server on: 10° to 35°C (50.0° to 95.0°F); altitude: 0 to 914.4 m (3000 ft) Decrease system temperature by 0.75°C for every 1000 feet increase in altitude. – Server off: 10° to 43°C (50.0° to 109.4°F); maximum altitude: 2133 m (7000 ft) – Shipment: -40° to 60°C (-40° to 140°F); maximum altitude: 2133 m (7000 ft) • Humidity: <ul style="list-style-type: none"> – Server on/off: 8% to 80% – Shipment: 5% to 100% <p>Size:</p> <ul style="list-style-type: none"> • Height: 43 mm (1.69 in.) • Depth: 686 mm (27.0 in.) • Width: 440 mm (17.32 in.) • Weight: approximately 15.6 kg (34.5 lb) when fully configured or 12.7 kg (28 lb) minimum 	<p>Heat output:</p> <p>Approximate heat output in British thermal units (Btu) per hour:</p> <ul style="list-style-type: none"> • Minimum configuration: 587 Btu/hr (172 watts) • Maximum configuration: 1878 Btu/hr (550 watts) <p>Electrical input:</p> <ul style="list-style-type: none"> • Sine-wave input (50-60 Hz) required • Input voltage low range: <ul style="list-style-type: none"> – Minimum: 100 V ac – Maximum: 127 V ac • Input voltage high range: <ul style="list-style-type: none"> – Minimum: 200 V ac – Maximum: 240 V ac • Input kilovolt-amperes (kVA), approximately: <ul style="list-style-type: none"> – Minimum: .172 kVA – Maximum: .550 kVA <p>Notes:</p> <ol style="list-style-type: none"> 1. Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use. 2. These levels were measured in controlled acoustical environments according to the procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779 and are reported in accordance with ISO 9296. Actual sound-pressure levels in a given location might exceed the average values stated because of room reflections and other nearby noise sources. The declared sound-power levels indicate an upper limit, below which a large number of computers will operate.
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- Air temperature:
 - Server on: 10° to 35°C (50.0° to 95.0°F); altitude: 0 to 914.4 m (3000 ft) Decrease system temperature by 0.75°C for every 1000 feet increase in altitude.
 - Server off: 10° to 43°C (50.0° to 109.4°F); maximum altitude: 2133 m (7000 ft)
 - Shipment: -40° to 60°C (-40° to 140°F); maximum altitude: 2133 m (7000 ft)
- Humidity:

- Server on/off: 8% to 80%
- Shipment: 5% to 100%

Server controls and LEDs

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. There are three different front views:

- 2.5-inch SCSI hot-swap hard disk drive
- 3.5-inch SCSI hot-swap hard disk drive
- 3.5-inch SATA non-hot-swap (simple swap) hard disk drive

Note: Both 3.5-inch configurations support an optional DVD-ROM.

The following figures illustrate the three types of servers.

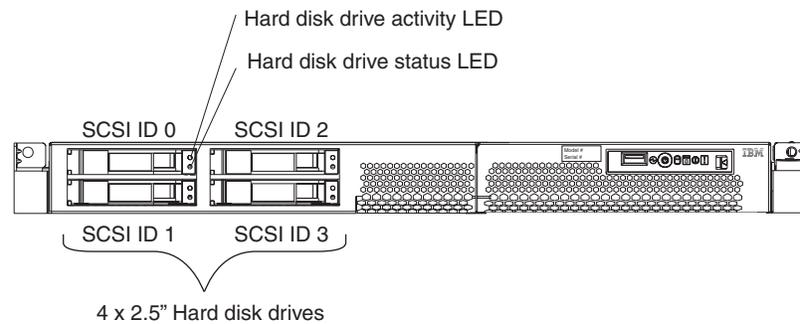


Figure 2. Server with a 2.5-inch SCSI hot-swap hard disk drive configuration

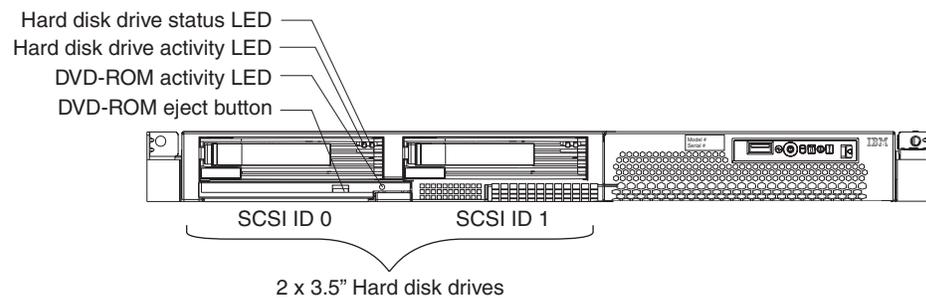


Figure 3. Server with a 3.5-inch SCSI hot-swap hard disk drive configuration

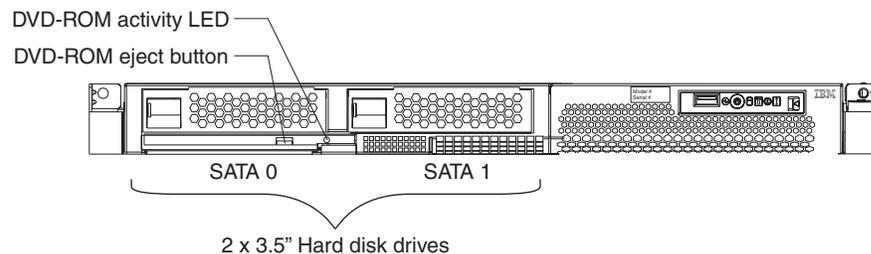


Figure 4. Server with 3.5-inch SATA simple swap hard disk drive configuration

The following information gives details about the controls, LEDs, and connectors on the front of the server.

Hot-swap hard disk drive activity LED: This LED is used on SCSI hard disk drives. Each hot-swap hard disk drive has an activity LED, and when this LED is flashing, it indicates that the drive is in use.

Hot-swap hard disk drive status LED: This LED is used on SCSI hard disk drives. When this LED is lit, it indicates that the drive has failed. If an optional IBM ServeRAID™ controller is installed in the server, when this LED is flashing slowly (one flash per second), it 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.

DVD-eject button: Press this button to release a DVD or CD from the DVD-ROM drive.

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

Note: The DVD-ROM option is available only on the 3.5-inch drive configurations (either SCSI or SATA hard disk drives).

Operator information panel

The operator panel is on the front right side of the server. Figure 5 shows the LEDs on the operator information panel.

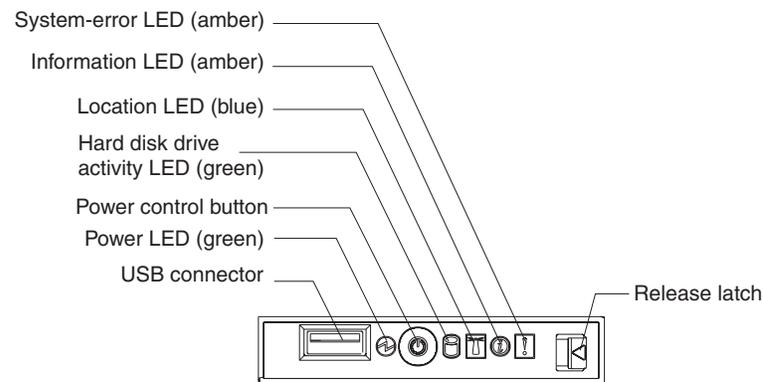


Figure 5. Operator panel

- **System-error LED:** When this LED is lit, it indicates that a system error has occurred. A system-error LED is also on the rear of the server. An LED on the light path diagnostics panel on the system board is also lit to help isolate the error. This LED is controlled by the BMC.
- **Release latch:** Press the release latch on the right side of the operator information panel to slide out the operator information panel and view the light path LEDs and buttons.
- **USB connector:** Connect a USB device to this connector.
- **Power LED:** When this green 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 is 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.

- **Power-control button:** Press this button to turn the server on and off manually. A power-control-button shield comes with the server. You can install this disk-shaped shield to prevent the server from being turned off accidentally.
- **Hard disk drive activity LED:** When this green LED is lit, it indicates that one of the hard disk drives is in use.

Note: Hard disk drive activity for the SCSI drives is shown in two places: on the hard disk drive itself, and also on the hard disk drive activity LED on the operator information panel.

There is no hard disk drive activity LED for the SATA drive. The only place the SATA drive indicates hard disk drive activity is on the operator information panel.

- **Location LED:** Use this blue LED to visually locate the server if it is in a location with numerous other servers. You can use IBM Director to light this LED remotely. This LED is controlled by the BMC.
- **Information LED:** When this amber LED is lit, it indicates that a non-critical event has occurred. Check the light path diagnostics panel (see “Light path diagnostics” on page 73) and the error log (see “POST error logs” on page 69).

Light path diagnostics panel

The light path diagnostics feature on the xSeries 336 server provides a preliminary method of determining the location of a problem.

The LEDs on the light path diagnostics panel are viewed by pressing the release latch on the front right side of the operator panel and sliding the panel out.

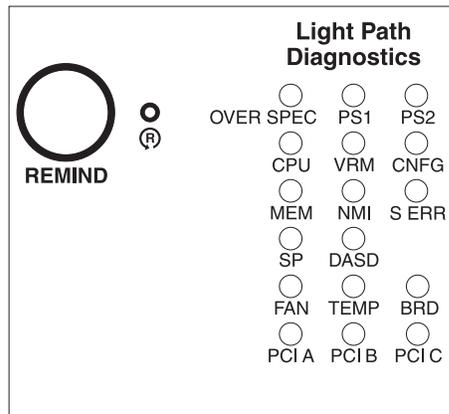


Figure 6. Light path diagnostics panel

For more detailed information about light path diagnostics, see “Light path diagnostics” on page 73.

Rear view

Figure 7 shows the connectors and LEDs on the rear of the server.

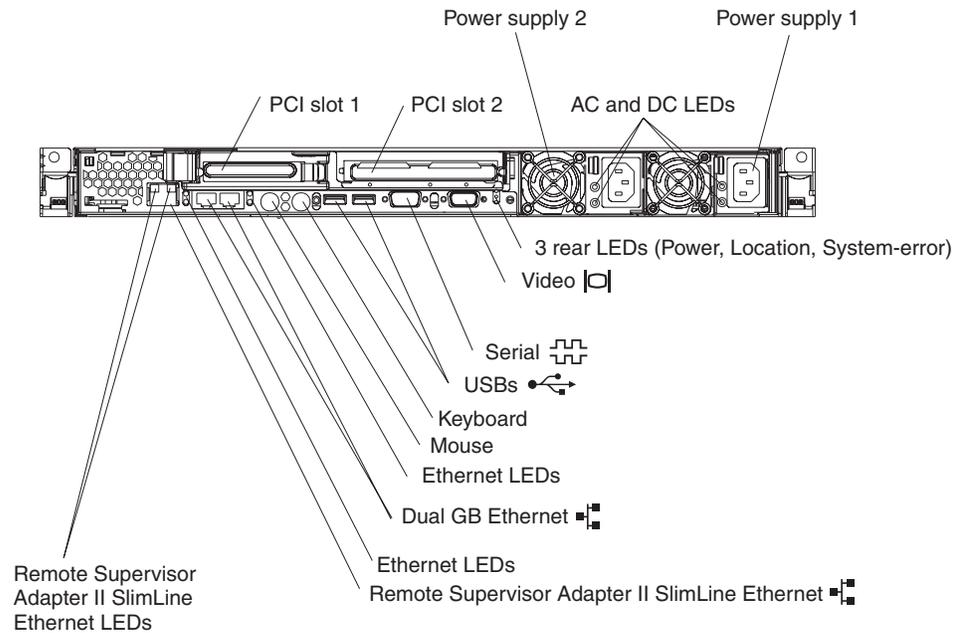


Figure 7. Rear view of the server

- **PCI slot 1:** This slot allows insertion of a low profile adapter.
- **PCI slot 2:** This slot allows insertion of any PCI-X or PCI-E type adapter.
- **Power supply 2:** Provides dc power to the server, usually is a redundant backup power supply.
- **AC LED:** This LED is to the left of the power-cord connector and is the top LED. This LED indicates that ac current is present in the server.
- **DC LED:** This LED is to the left of the power-cord connector and is the bottom LED. This LED indicates that dc current is present in the server.
- **Power supply 1:** Provides dc power to the server, usually is the primary power supply.
- **Power LED:** This is the top LED and it indicates that ac power is present on the server.
- **Location LED:** This middle (blue) LED assists you in visually locating the server when it is among other servers.
- **System-error LED:** This is the bottom LED that indicates that a system error occurred.
- **Video connector:** Connect a monitor to this connector.
- **Serial connector:** Connect a 9-pin serial device to this connector.
- **USB connectors:** Connect a USB device to these connectors.
- **Keyboard connector:** Connect a PS/2 keyboard to this connector.
- **Mouse connector:** Connect a mouse or other PS/2 device to this connector.
- **Ethernet LEDs:** There is a set of LEDs for each Ethernet connector. The top LED is the Ethernet link LED. When it is lit, it indicates that there is an active connection on the Ethernet port.

The bottom LED is the Ethernet activity LED. When it flashes, it indicates that data is being transmitted or received between the server and a network device. The flashing frequency is proportional to the amount of traffic on the network link.

- **Dual GB Ethernet connectors:** Use these connectors to connect the server to an Ethernet network.
- **Remote Supervisor Adapter II SlimLine Ethernet connector:** Use this connector to connect the server to a network for system-management information control. This Ethernet connector is active only when you have installed the Remote Supervisor Adapter II SlimLine option.
- **Remote Supervisor Adapter II SlimLine Ethernet LEDs:** These LEDs are located on the Ethernet connector and are at the top left and top right positions. The top left LED is the Ethernet link LED for the Remote Supervisor Adapter II SlimLine; when lit, it indicates that there is an active connection on the Ethernet port.

The top right LED is the Ethernet activity LED for the Remote Supervisor Adapter II SlimLine. When this LED flashes it indicates that data is being transmitted or received between the server and a network device. The flashing frequency is proportional to the amount of traffic on the network link.

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 BMC is shut down; however, the server can respond to requests from the BMC, 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

When you connect the server to an ac power source, the power supply fans turn on immediately; then, approximately 20 seconds later, 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 operating system supports the system-management software for an optional Remote Supervisor Adapter II SlimLine option, the system-management software can turn on the server.
- If the operating system supports the Wake on LAN feature, the Wake on LAN feature can turn on the server.

Turning off the server

When you turn off the server and leave it connected to ac power, the power supply fans continue to run and the server can respond to requests from the BMC, 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.

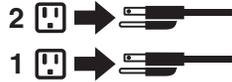
Some operating systems require an orderly shutdown before you turn off the server. See the operating-system documentation for information about shutting down the operating system.

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.



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

- You can turn off the server from the operating system, if the 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 the operating system supports this feature.
- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the server.
- If an optional Remote Supervisor Adapter II SlimLine is installed in the server, the server can be turned off from the Remote Supervisor Adapter II SlimLine user interface.
- If the Wake on LAN feature turned on the server, the Wake on LAN feature can turn off the server.
- The BMC 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 BMC.

Chapter 2. Configuring the server

The *ServerGuide™ Setup and Installation* CD provides software setup tools and installation tools that are specifically designed for an IBM server. Use this CD during the initial installation of the server to configure basic hardware features and to simplify the operating-system installation.

Configuration programs

In addition to the *ServerGuide Setup and Installation* CD, you can use the following configuration programs to customize the server hardware:

- Configuration/Setup utility program
- Ethernet controller configuration
- BMC firmware update utility program
- RAID configuration programs
 - LSI Logic configuration utility program
 - ServeRAID Manager
- SCSISelect utility program
- Using the ServeRaid configuration programs

For more information about these programs, see “Configuring the server” in the *User’s Guide* on the *IBM xSeries Documentation* CD.

Starting the Configuration/Setup Utility program

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

1. Turn on the server and watch the monitor screen.
2. When the message Press F1 for Configuration/Setup appears, press F1. If an administrator password has been set, you must type the administrator password to access the full Configuration/Setup Utility menu.
3. Follow the instructions on the screen.

Chapter 3. Customer replaceable units

This chapter provides instructions for installing, removing, and connecting optional devices that the server supports.

Installation guidelines

Before you begin installing options, read the following information:

- Read Appendix B, “Safety information,” on page 129 and the guidelines in “Handling static-sensitive devices” on page 16. This information will help you work safely with the server and options.
- Make sure that you have an adequate number of properly grounded electrical outlets for the server, monitor, and other devices.
- Back up all important data before you make changes to disk drives.
- You do not have to turn off the server to install or replace hot-swap power supplies or hot-swap fans.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the server, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- For a list of supported options for the server, go to <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

System reliability considerations

To help ensure proper 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.
- If the server has redundant power, each of the power-supply bays has a power supply installed in it.
- There is adequate space around the server to allow the server cooling system to work properly. Leave approximately 50 mm (2.0 in.) of open space around the front and rear of the server. Do not place objects in front of the fans. For proper cooling and airflow, replace the server cover before turning on the server. Operating the server for extended periods of time (more than 30 minutes) with the server cover removed might damage server components.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan within 48 hours.
- When replacing a hot plug fan, you have 5 minutes to install the new fan or the server will shut down.
- You have replaced a hot-swap drive within 2 minutes of removal.

Working inside the server with the power on

The 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 let 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 the server and other electronic devices. 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.
- Wear an electrostatic-discharge wrist strap, if one is available.
- 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 the 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 336 Type 8837 server

Figure 8 shows the major components in the server.

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

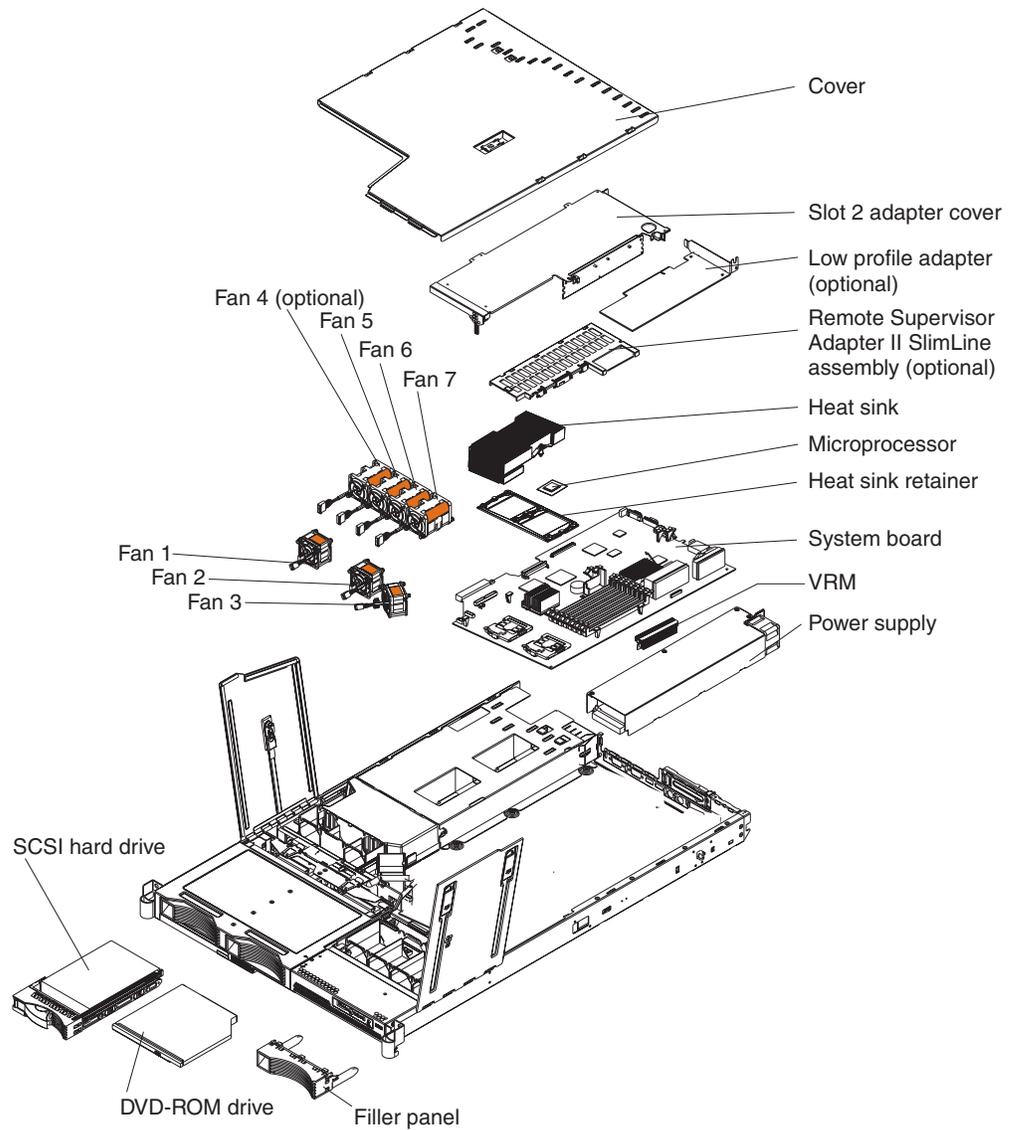


Figure 8. Major components

Removing and installing the cover

This section describes how to remove and install the cover.

Removing the cover

Complete the following steps to remove the server cover:

Attention: Before removing the server cover, remove the server from the rack and open the two fan doors as shown in Figure 9.

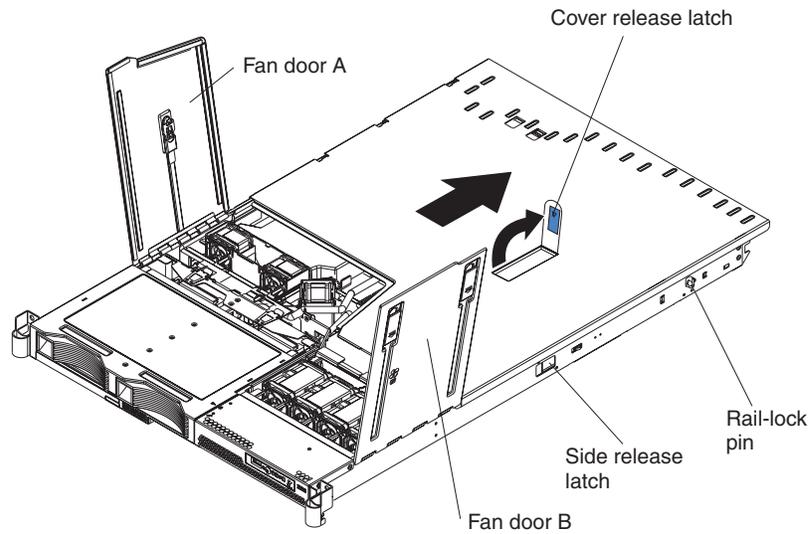


Figure 9. Cover removal

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Remove the server from the rack:
 - a. Pull the server out, about a third of the way, until it stops.
 - b. Slide both side release latches toward the front of the server. Make sure that rail-lock pins are in a vertical position and pull the server out and remove it from the rack.
3. Open both fan doors, fan door A and fan door B. To open fan door A slide the slide latch to the left, and lift the door panel up. To open fan door B slide the two slide latches to the right, and lift the door panel up.
4. Remove the server cover:
 - a. Lift up the cover release latch and slide the cover to the rear of the server.
 - b. Make sure that the server cover slides away from the insets that are on the front, rear and sides of the server cover.
 - c. Lift the cover off the server and set the cover aside.

Attention: For proper cooling and airflow, replace the server cover before turning on the server. Operating the server for extended periods of time (more than 30 minutes) with the server cover removed might damage server components.

Installing the cover

Complete the following steps to install the server cover:

1. Position the internal cables so that they do not interfere with the cover installation.

Important: Before sliding the cover forward, make sure that all the tabs on both the front, rear, and side of the cover engage the chassis correctly. If all the tabs do not engage the chassis correctly, it will be very difficult to remove the cover later.

2. Position the cover on top of the server and slide it forward.
3. Press down on the cover release latch until the cover properly engages all the inset tabs on the server.

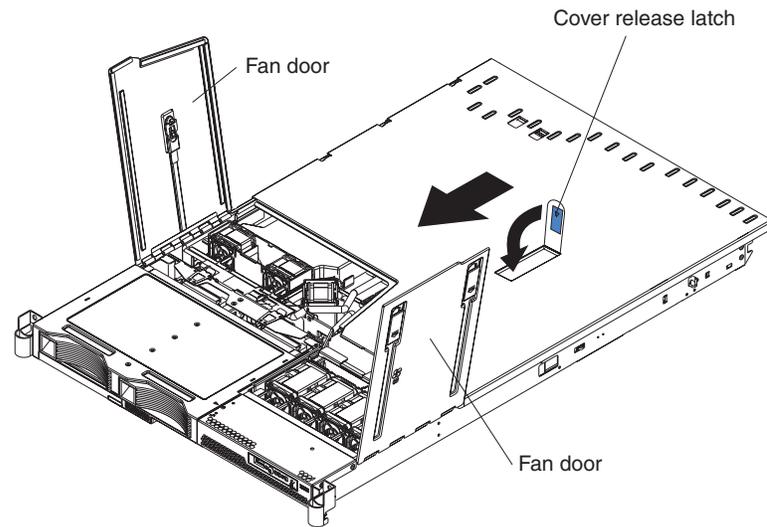


Figure 10. Cover installation

4. Close the fan doors.
5. Install the server in the rack. See the *Rack Installation Instructions* that come with the server for details.

Working with adapters

This section describes how to install an adapter in the server. Before you continue with the adapter-installation procedures, review “Adapter considerations.”

Adapter considerations

The following information describes the types of adapters the server supports and other information you must consider when installing an adapter:

- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this section. If you need to change the switch settings or jumper settings on the adapter, follow the instructions that come with the adapter.
- There are several different types of adapters you can install depending on which slots are available. The following information identifies what type adapters you can connect to PCI slots 1 and 2, and where these slots are located on the system board:
 - Slot 1: You can install only a PCI-X low-profile adapter into slot 1.
 - Slot 2: You can install any PCI-X or PCI Express adapter into slot 2.

Note: For the PCI Express adapter, you must install an optional riser card on the system board.

Figure 11 shows the location of, and access to, the riser card retention latches for the slot 1 and 2 riser cards.

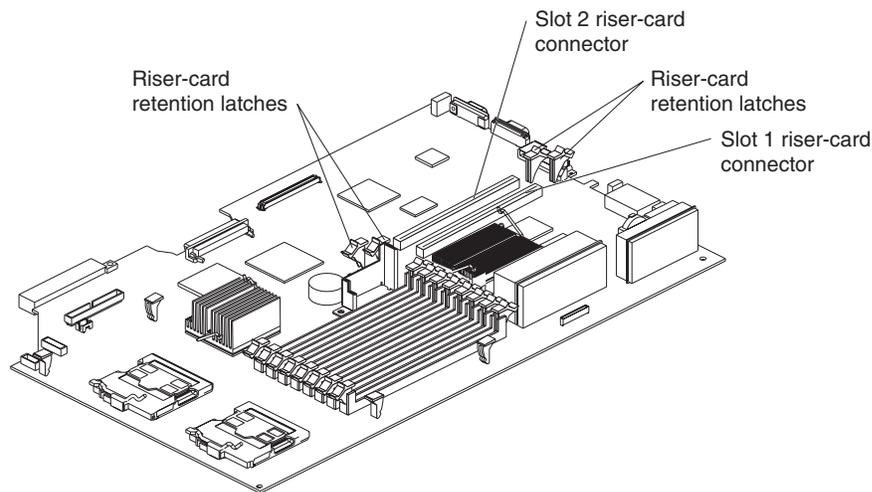


Figure 11. Adapter connectors and latches

- When the system starts (boots), it starts the system devices in the following order, if you have not changed the default boot precedence:
 - Integrated Ethernet controllers
 - Integrated SCSI controller
 - PCI-X slot 1
 - PCI-X or PCI-Express slot 2

Installing an adapter

Complete the following steps to install an adapter:

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Turn off the server and peripheral devices (see “Turning off the server” on page 10); then, disconnect all power cords and external cables.
3. Remove the cover (see “Removing the cover” on page 18).
4. Follow the cabling instructions, if any, that come with the adapter. Route the adapter cables before you install the adapter.
5. Determine which slot you want to use for the adapter, either slot 1 for a low-profile adapter or slot 2 for any type of adapter. See Figure 11 on page 20 for the locations of slot 1 and slot 2 on the system board.
6. Install the adapter:
 - To install a low-profile adapter, continue with “Installing a low-profile adapter into slot 1.”
 - To install an adapter in slot 2 go to “Installing an adapter into slot 2” on page 22.

Installing a low-profile adapter into slot 1

Complete the following steps to install the low-profile adapter:

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.

Attention: When you handle static-sensitive devices, take precautions to avoid damage from static electricity (see “Handling static-sensitive devices” on page 16).

2. Remove the expansion slot cover from slot 1. From the rear of the server, push the slot 1 expansion cover to the left and then toward the inside of the server. Remove the slot 1 expansion cover and store it in a safe place.

Note: You might have to use a coin or screwdriver to slide the expansion slot cover to the left.

3. Remove the adapter from the static-protective package and set any jumpers or switches on the adapter as directed by the adapter manufacturer.
4. Slide the I/O connector portion of the adapter through the slot 1 opening.

Attention: When you install an adapter, make sure that the adapter is correctly seated in the connector before you turn on the server. An improperly seated adapter might cause damage to the system board, the riser card, or the adapter.

5. As you start inserting the adapter through the slot 1 opening, align the edge connector on the low-profile adapter with the connector on the riser card. Press the edge connector *firmly* into the riser-card connector. Make sure that the adapter snaps into the riser card securely and the adapter is lying on top of the low-profile adapter support.

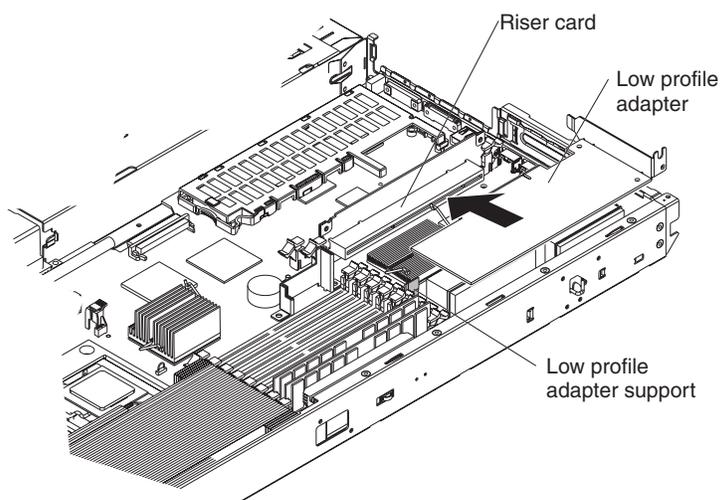


Figure 12. Low-profile adapter installation, slot 1

6. Push the adapter down past the tab so that the adapter snaps into place on the support.
7. Check the retention latches on the riser card and make sure that they are still securely in place.
8. Connect any internal cables to the adapter. See the instructions that come with the adapter for details.

Attention: Make sure that the cables do not block the flow of air from the fans. See “System-board cable channels” on page 63 for cable routing areas on the system board.
9. Perform any configuration tasks that are required for the adapter.
10. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 47.

Installing an adapter into slot 2

Complete the following steps to install an adapter into slot 2:

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.

Attention: When you handle static-sensitive devices, take precautions to avoid damage from static electricity (see “Handling static-sensitive devices” on page 16).

2. Open the retaining clips on both sides of the slot 2 riser card. Push the clips down, away from the riser card, until the clips are no longer attached to the riser card.

Note: Insert your finger into the access hole on the slot 2 adapter cover to open the retention latch at the rear of the server.

Figure 13 on page 23 shows the location of the access hole on the adapter cover, the riser card and the riser-card retention latches.

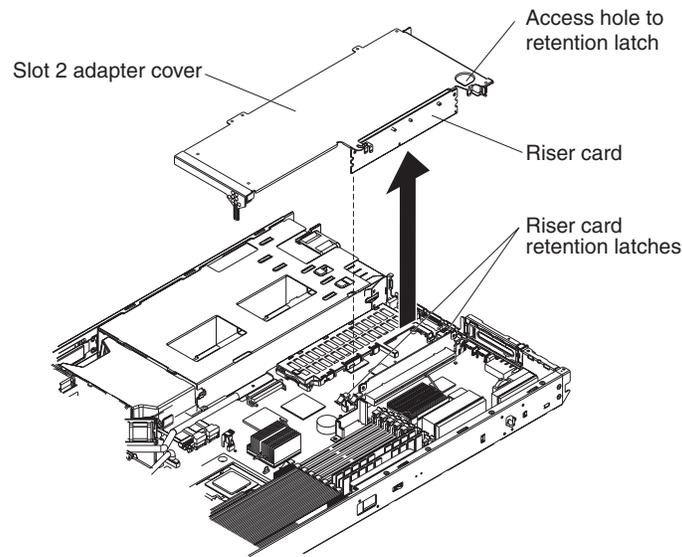


Figure 13. Slot 2 connectors and latches

3. Lift up and remove the slot 2 adapter cover. The slot 2 riser card is attached to the adapter cover, and you remove the riser card along with the adapter cover. Figure 14 identifies the components that are referred to in this procedure.

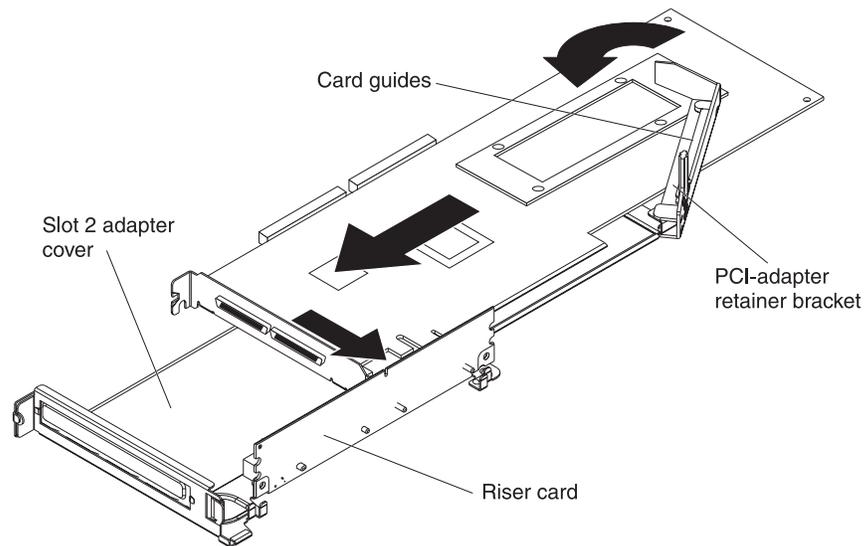


Figure 14. Riser card and adapter cover removal

4. Remove the expansion-slot cover for slot 2, which is also attached to the slot 2 adapter cover, to provide an opening for the adapter. Hold the adapter cover so that the expansion-slot cover faces you. Slide the expansion slot cover first to the left, and then in and toward the inside of the adapter cover. You can now remove the expansion slot 2 cover. Store the cover in a place safe.

Notes:

- a. You might have to use a coin or screwdriver to slide the expansion slot cover to the left.

- b. If you are installing a PCI-Express adapter, you need an optional riser card to plug the adapter into the system board.
5. If you are installing a full-length adapter, rotate the PCI-adapter retainer bracket 90°, away from the adapter cover, so that you can insert the full-length adapter.
6. Slide the I/O connector portion of the adapter through the slot opening from which you removed the expansion slot cover.
7. As you start inserting the adapter through the slot opening, align the edge connector on the adapter with the riser-card connector and press the adapter *firmly* into the connector. Make sure that the adapter snaps into place securely to secure the adapter in the riser-card connector.

Attention: When you install an adapter, make sure that you seat the adapter correctly in the riser-card connector before you turn on the server. An improperly seated adapter might cause damage to the system board, the riser card, or the adapter.
8. If you are installing a full-length adapter, rotate the PCI adapter retainer bracket 90°, toward the adapter cover. Place the adapter between the upper guides and lower guide of the PCI-adapter retainer bracket. The spacer fits between the top of the adapter and the bottom of the adapter cover.
9. Make sure that the PCI-adapter retainer bracket is flush against the adapter cover.
10. Grasp the adapter cover by its top edge or upper corners and align the riser card with the guides for the riser-card connector. Press the riser card edge connector *firmly* into the slot 2 riser-card connector on the system board.

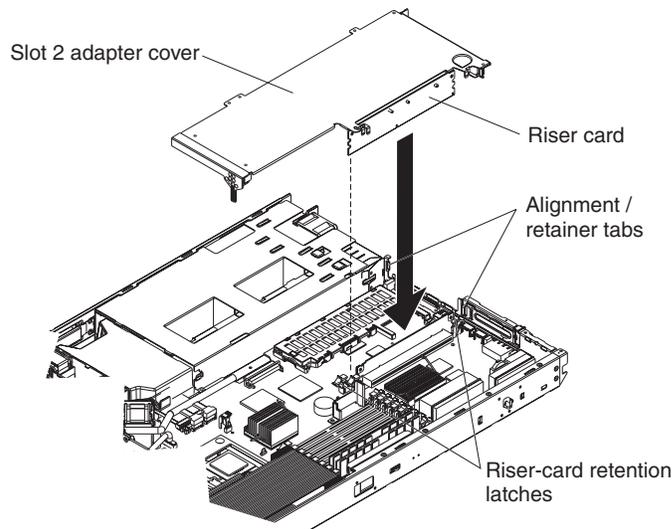


Figure 15. Installing the slot 2 adapter and riser card assembly

11. Make sure that the retention latches snap into place to secure the slot 2 riser card into the slot 2 riser-card connector.

Attention: When you install an adapter, make sure that you seat the riser card edge connector correctly in the slot 2 riser-card connector before you turn on the server. An improperly seated riser card might cause damage to the system board, the riser card, or the adapter.
12. Connect any internal cables to the adapter. See the instructions that come with the adapter for details.

Attention: Make sure that the cables do not block the flow of air from the fans. See “System-board cable channels” on page 63 for cable routing areas on the system board.

13. Perform any configuration tasks that are required for the adapter.
14. If you have other options to install or remove, do so now.
15. Go to “Completing the installation” on page 47.

Installing a Remote Supervisor Adapter II SlimLine

The xSeries 336 server supports the Remote Supervisor Adapter II SlimLine. The Remote Supervisor Adapter II SlimLine does not use a PCI slot in the xSeries 336; instead, the Remote Supervisor Adapter II SlimLine option connects directly to the system board.

Complete the following steps to install the Remote Supervisor Adapter II SlimLine:

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Turn off the server and disconnect the AC power cord.
3. Remove the slot 2 adapter cover to allow access to the mounting brackets for the Remote Supervisor Adapter II SlimLine (see “Installing an adapter into slot 2” on page 22).
4. Place the Remote Supervisor Adapter II SlimLine cover over the top of the adapter. On the right side of the adapter (the side closest to the power-supply bay), hook the right four snaps on the cover underneath the bottom of the adapter.

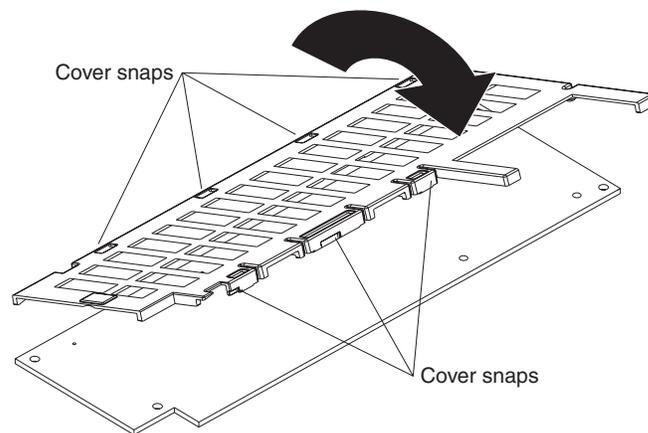


Figure 16. Installing the cover on the Remote Supervisor Adapter II SlimLine

5. Hook the left snaps from the cover so that it hooks underneath the bottom of the adapter.

Note: Align the locating pin on the adapter to the alignment hole on the rear mounting bracket.

6. The server comes with mounting brackets on the system board. There is a front mounting bracket and a rear mounting bracket that hold the Remote Supervisor Adapter II SlimLine. Slide the rear of the adapter underneath the flanges of the rear mounting bracket.

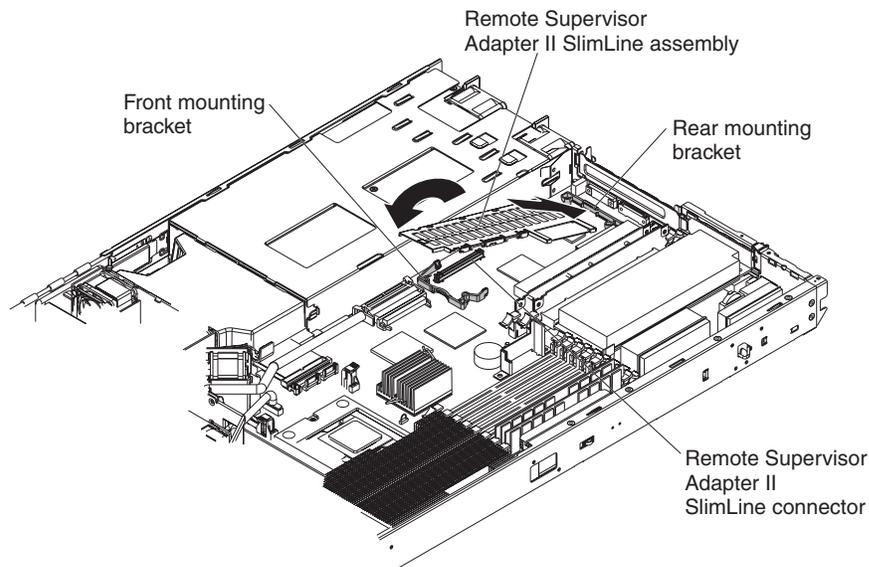


Figure 17. Installing the Remote Supervisor Adapter II SlimLine

7. Push the front of the adapter down, onto the front mounting bracket, until it snaps into place.
8. If you have other options to install or remove, do so now.
9. Go to “Completing the installation” on page 47.

Hard disk drives

This section describes how to install a hard disk drive in the server. Before you continue with the hard disk drive installation procedures, review “Hard disk drive considerations.”

Hard disk drive considerations

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

- The server supports the following three configurations:
 - Configuration 1
 - Four 2.5-inch hot-swap SCSI hard disk drives
 - Configuration 2
 - Two 3.5-inch slim hot-swap SCSI hard disk drives
 - One 9.5-mm-high DVD-ROM drive (optional)
 - Configuration 3
 - Two 3.5-inch non-hot-swap (simple swap) Serial ATA (SATA) hard disk drives
 - One 9.5-mm-high DVD-ROM drive (optional)
- Both SCSI configuration models of the server come with a hot-swap SCSI backplane.
- The SCSI server models support low voltage differential (LVD) hot-swap drives. Each hot-swap drive is in a tray, which has a green activity LED and an amber status LED in the upper-right corner. These LEDs are lit if the drive is active and, in some cases, if the drive fails.

- Each hot-swap drive has a single-connector-attached (SCA) connector, which connects directly to the hot-swap SCSI backplane. The backplane attaches to connector J-35 on the system board and controls the SCSI IDs for the hot-swap drives.
- A simple swap disk drive does not have a backplane, and it does not have indicator LEDs. Simple swap disk drives have a panel-mount connection at the rear of the hard disk drive cage, which enables the simple swap disk drives to easily connect to both the signal and power connections.
- Before you install any type of hard disk drive, read the following information:
 - Inspect the drive tray for signs of damage before inserting the hard disk drive.
 - Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
- If you are installing a hot-swap drive, continue with “Installing a hot-swap hard disk drive.” If you are installing a simple-swap drive, go to “Installing a simple swap hard disk drive” on page 28.

Installing a hot-swap hard disk drive

If you are installing a 2.5-inch hot-swap drive, continue with “Installing a 2.5-inch hot-swap hard disk drive.” If you are installing a 3.5-inch hot-swap drive, go to “Installing a 3.5-inch hot-swap hard disk drive” on page 28.

Installing a 2.5-inch hot-swap hard disk drive

Complete the following steps to install a 2.5-inch hot-swap SCSI hard disk drive:

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Remove the filler panel from the drive bay.

Note: To make sure there is adequate system cooling, do not operate the server for more than 2 minutes without either a hard disk drive or a filler panel installed in each bay.

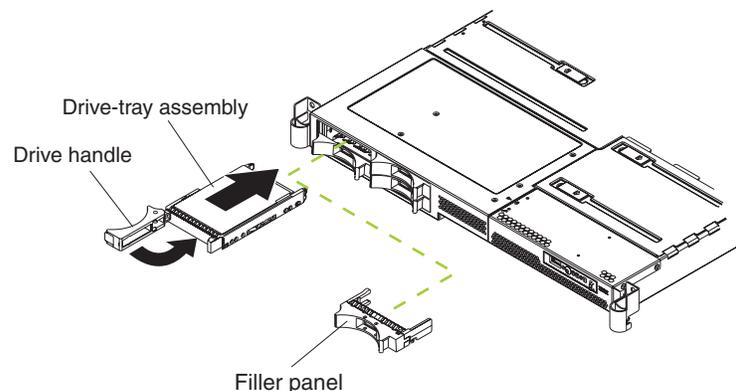


Figure 18. 2.5-inch hot-swap hard disk drive installation

3. Place the drive handle in the open position and slide the drive into the bay.
4. Close the drive handle.
5. Make sure that the drive is correctly installed in the tray.
6. Check the hard disk drive status LED and activity LED to verify that the drive is operating correctly.
7. If you have other options to install or remove, do so now.

8. Go to “Completing the installation” on page 47.

Installing a 3.5-inch hot-swap hard disk drive

Complete the following steps to install a 3.5-inch hot-swap SCSI hard disk drive:

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Remove the filler panel from the appropriate drive bay.

Note: To make sure there is adequate system cooling, do not operate the server for more than 2 minutes without either a hard disk drive or a filler panel installed in each bay.

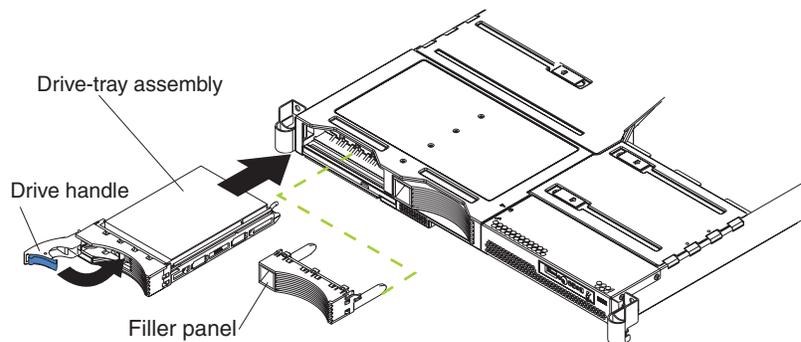


Figure 19. 3.5-inch hot-swap hard disk drive installation

3. Place the drive handle in the open position and slide the drive into the bay.
4. Close the drive handle.
5. Check the hard disk drive status LED and activity LED to verify that the drive is operating correctly.
6. If you have other options to install or remove, do so now.
7. Go to “Completing the installation” on page 47.

Installing a simple swap hard disk drive

Before you install a simple-swap SATA hard disk drive, turn off the server and all attached peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.

Complete the following steps to install a simple-swap SATA hard disk drive.

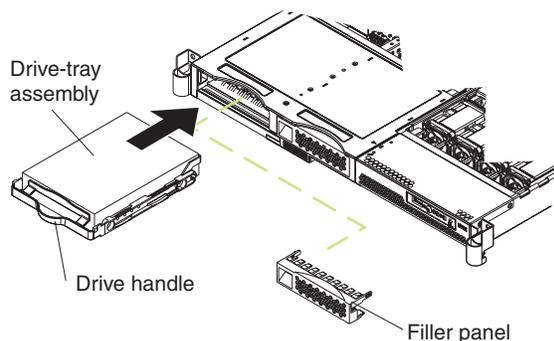


Figure 20. Installing a simple-swap hard disk drive

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Remove the filler panel for the drive from either bay.

Note: To make sure there is adequate system cooling, do not operate the server for more than 2 minutes without either a hard disk drive or a filler panel installed in each bay.

3. If you have only one simple swap hard disk drive, you can install it in either the left bay or the right bay.
4. Insert the simple swap hard disk drive into the drive tray assembly.
5. Slide the drive into the bay until the rear of the drive snaps into place with the rear panel-mount connector. This simple swap connector contains the signal and power connections that are needed by the SATA drive.
6. Install the filler panel for the drive.
7. If you have other options to install, install them now. Otherwise, go to “Completing the installation” on page 47.

Installing and removing an internal DVD-ROM drive or DVD-ROM blank bezel

The following notes describe the type of DVD-ROM drive the server supports and other information that you must consider when installing a DVD-ROM drive:

- The server supports the installation of an optional DVD-ROM drive only when you are using a 3.5-inch hard disk drive configuration.
- The DVD-ROM drive must be a slim 9.5 mm drive and you install it underneath the 3.5-inch hard disk drive, on the left side.

Note: DVD-ROM, CD-ROM and diskette drives can also be attached externally using the USB connector.

If you are removing an internal DVD-ROM drive or blank bezel, continue with “Removing an internal DVD-ROM drive or DVD-ROM blank bezel” on page 29. If you are installing an internal DVD-ROM drive or blank bezel, go to “Installing an internal DVD-ROM drive” on page 31.

Removing an internal DVD-ROM drive or DVD-ROM blank bezel

Complete the following steps to remove an internal DVD-ROM drive or DVD-ROM blank bezel:

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables (see “Turning off the server” on page 10); then, remove the cover (see “Removing the cover” on page 18).

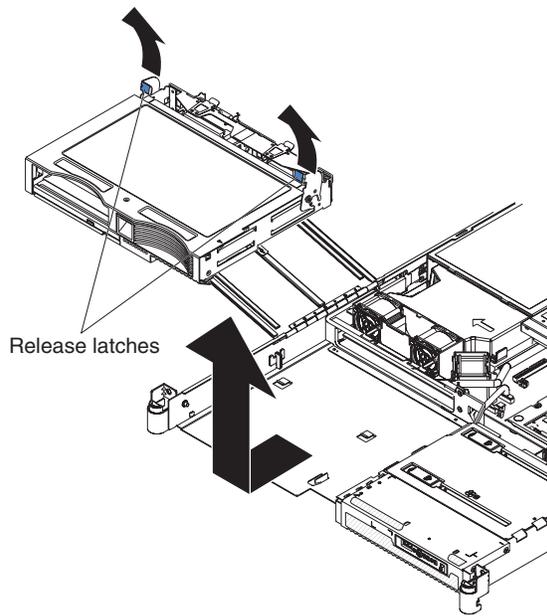


Figure 21. Removing the hard drive cage

3. Rotate the two release latches on the 3.5-inch hard drive cage up and then forward to disconnect the electrical connectors and move the drive cage forward; then, lift the 3.5-inch hard drive cage out of the server.
4. Remove the left hard disk drive from the 3.5-inch hard drive cage.

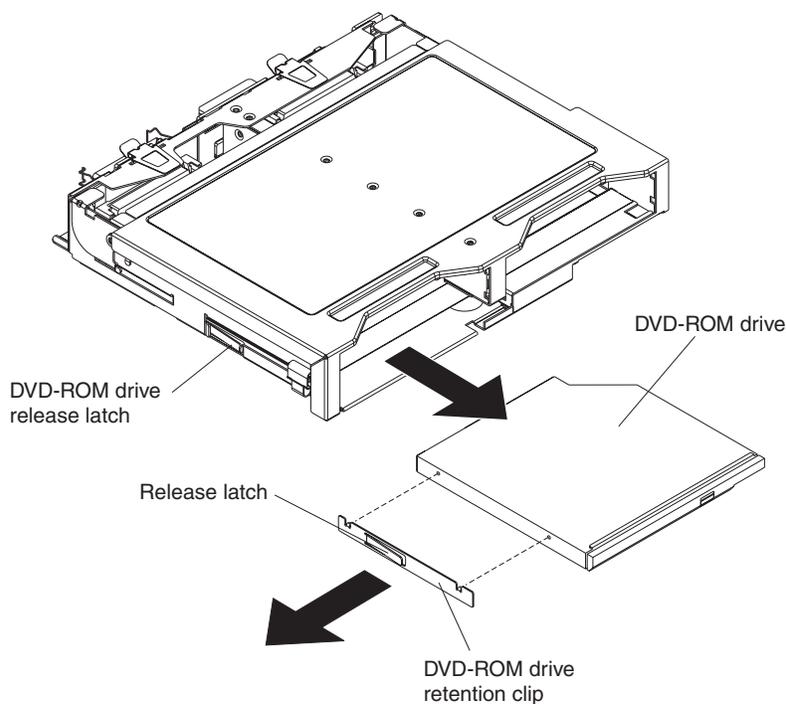


Figure 22. Removing an internal DVD-ROM drive

5. Press the release latch on the left side of the DVD-ROM drive or DVD-ROM blank bezel; then, pull the drive or blank bezel and attached retention clip out of the drive cage.

6. Remove the retention clip from the DVD-ROM drive or DVD-ROM blank bezel. This retention clip will be needed when you install a DVD-ROM drive or DVD-ROM blank bezel in the hard drive cage.
7. Go to “Installing an internal DVD-ROM drive” on page 31.

Installing an internal DVD-ROM drive

Complete the following steps to install an internal DVD-ROM drive or DVD-ROM blank bezel:

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables (see “Turning off the server” on page 10); then, remove the cover (see “Removing the cover” on page 18).

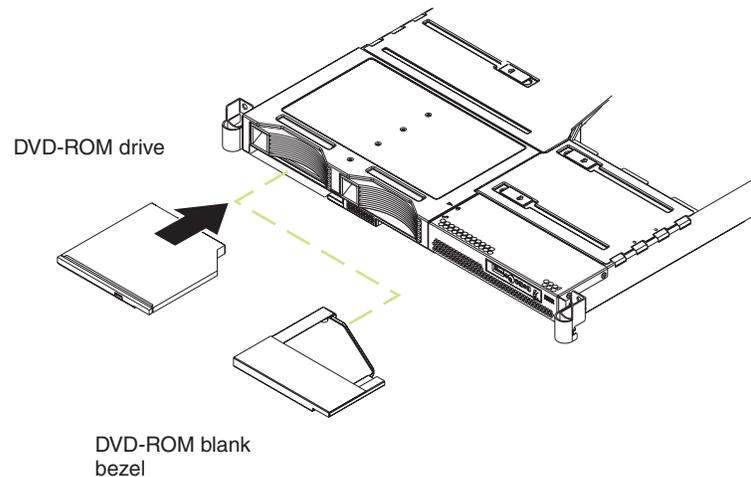


Figure 23. Internal DVD-ROM drive and blank bezel

Note: Make sure that you disconnect all power to the server before removing the hard disk drives.

3. Remove the DVD-ROM drive or DVD-ROM blank bezel (see “Removing an internal DVD-ROM drive or DVD-ROM blank bezel” on page 29).

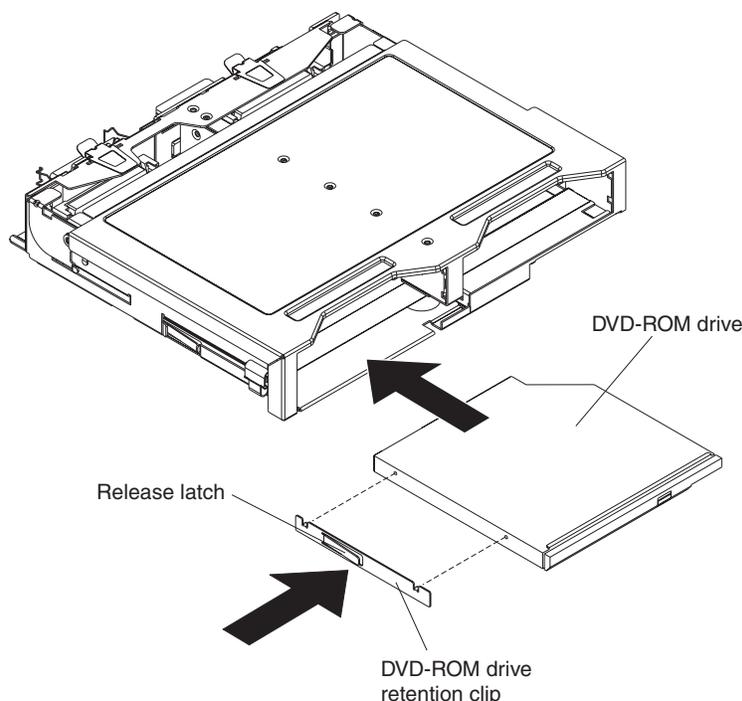


Figure 24. Installing an internal DVD-ROM drive

4. Mount the DVD-ROM retention clip on the DVD-ROM drive or DVD-ROM blank bezel that you are installing.
5. Slide the DVD-ROM drive or DVD-ROM blank bezel with the attached mounting bracket into the drive cage, pushing it into the cage until the retention clip engages.
6. Reinstall the previously removed hard disk drive in the 3.5-inch hard drive cage (see “Hard disk drives” on page 26).
7. If you have other options to install or remove, do so now.
8. Go to “Completing the installation” on page 47.

Memory modules

This section provides information on the types of memory modules the server supports, and describes how to install memory modules.

Memory module considerations

This section contains information that you must consider when installing DIMMs:

- The server supports up to eight PC3200 DDR II ECC Registered SDRAM DIMMs in sizes ranging from 256 MB to 2 GB. The minimum memory size is 512 MB. The maximum supported memory size is 16 GB.
- The server supports 256 MB, 512 MB, 1 GB, and 2 GB DIMMs. See the ServerProven® list at <http://www.ibm.com/servers/eserver/serverproven/compat/us/> for a list of memory modules that the server supports.
- The server comes with one pair of DIMMs installed in DIMM slots 1 and 2 on the system board. The server comes with either 512 MB (two 256 MB DIMM) for the 2.8GHz models or 1GB (two 512MB DIMM) for all other models.
- The server uses interleaved DIMMs; you must add, remove, or replace DIMMs in pairs. Each pair must be of the same type, capacity, and speed.

- You can increase the amount of memory in the server by replacing them with higher-capacity DIMMs or installing an additional pair of DIMMs into the remaining slots. Figure 25 shows the memory slots on the system board.

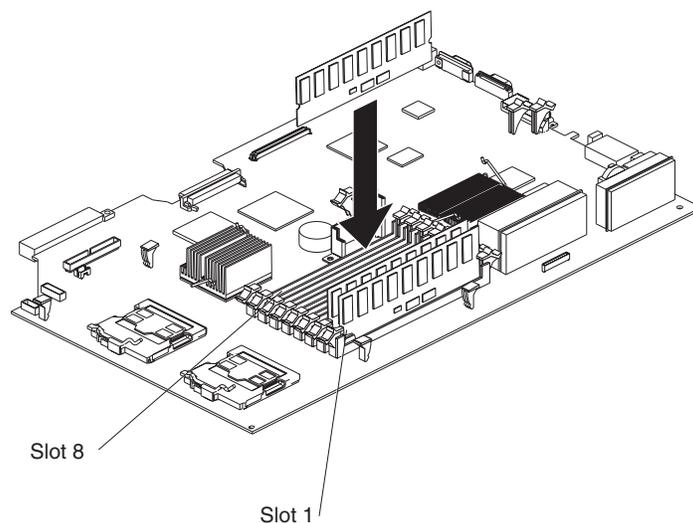


Figure 25. Memory module installation

Note: When installing additional DIMMs, always install in pairs starting with slots 1 and 2.

- The server supports Chipkill™ memory technology, which enables the server to function with one bad chip on a DIMM. The bad memory module must be on an x4 DIMM. The 256 MB and 512 MB DIMMs that are x8 DIMMs do not support Chipkill memory (see Table 1).

Table 1. Supported Chipkill memory configurations

DIMM size	Type	Supported by Chipkill	Minimum	Maximum
256 MB	32Mx8	No	512 MB	2 GB
512 MB	64Mx8	No	1 GB	4 GB
512 MB	64Mx4	Yes	1 GB	4 GB
1 GB	128Mx4	Yes	2 GB	8 GB
2 GB	256Mx4	Yes	4 GB	16 GB

- You can configure the server to use memory mirroring. Memory mirroring stores data in two pairs of DIMMs simultaneously. When using memory mirroring, you must install two pairs of DIMMs at a time. All the DIMMs you use in memory mirroring must be identical. See Table 2 for the DIMM pairs that are in each pair.

Note: The use of memory mirroring decreases the amount of available memory by half.

Table 2. Memory mirroring DIMM installation sequence

Pair	DIMM pairs
1	Slots 1 and 2
2	Slots 3 and 4

Table 2. Memory mirroring DIMM installation sequence (continued)

Pair	DIMM pairs
3	Slots 5 and 6
4	Slots 7 and 8

- The server also supports memory sparing; however, the sparing feature is mutually exclusive with mirroring. The sparing feature disables the failed memory from the system configuration and activates a memory sparing pair of DIMMs to replace the failed active DIMM pair.

Before you can enable the memory sparing feature, you must install one additional pair of DIMMs. The memory sparing DIMM pair must be the same speed, type, and the same size as or larger than the active DIMM pair.

To enable memory mirroring or sparing through the Configuration/Setup Utility program, select **Advanced Setup** from the main menu, and select **Memory Configuration**. For more information about using the Configuration/Setup Utility program, see the *User's Guide* on the IBM Documentation CD. See Table 3 for memory-sparing DIMM connector assignments.

Table 3. Memory-sparing DIMM connector assignments

Active DIMM connectors	Memory sparing DIMM connectors
1 and 2	3 and 4
Slots 1 and 2 Slots 3 and 4	5 and 6
Slots 1 and 2 Slots 3 and 4 Slots 5 and 6	7 and 8

- When you restart the server after adding or removing a DIMM, the server displays a message that the memory configuration has changed.

Installing memory modules

This section provides an overview of the procedure for installing memory modules.

Complete the following steps to install a DIMM:

1. Read Appendix B, "Safety information," on page 129 and "Installation guidelines" on page 15.
2. Turn off the server and peripheral devices, and disconnect the power cords and external cables (see "Turning off the server" on page 10).
3. Remove the cover (see "Removing the cover" on page 18).

Attention:

- Avoid touching the components and gold-edge connectors on the DIMMs. Make sure that the DIMMs are completely and correctly seated in the slots. Incomplete insertion might cause damage to the system board or to the DIMMs.
 - When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For information about handling these devices, see "Handling static-sensitive devices" on page 16.
 - To avoid breaking the retaining clips or damaging the DIMM slots, open and close the clips gently. Do not force a DIMM into a slot.
4. Open the retaining clips on the DIMM connector.

5. Touch the static-protective package containing the DIMM to any unpainted metal surface on the server. Then, remove the DIMM from the package.
6. Align the DIMM with the slot and press it straight down into the connector until the retainer clips snap into the locked position.

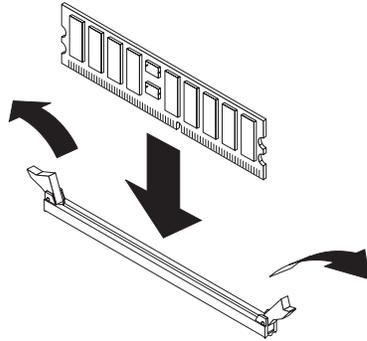


Figure 26. DIMM retainer clips

7. If you have other options to install or remove, do so now.
8. Go to “Completing the installation” on page 47.

Additional microprocessor installation

This section provides information on adding an additional microprocessor. To remove a microprocessor, see “Removing a microprocessor and heat sink” on page 54.

Microprocessor considerations

The following notes describe the type of microprocessor that the server supports and other information that you must consider when installing a microprocessor:

- The server supports up to two microprocessors (two-way support); the IBM xSeries 336 server comes with one Xeon microprocessor installed. With two microprocessors, the server can operate as a symmetric multiprocessing (SMP) server.

With SMP, application programs can distribute the processing load between the microprocessors. This enhances performance for database and point-of-sale applications, integrated manufacturing solutions, and other applications.

- Figure 27 shows the microprocessor sockets and the voltage regulator module (VRM) slots on the system board.

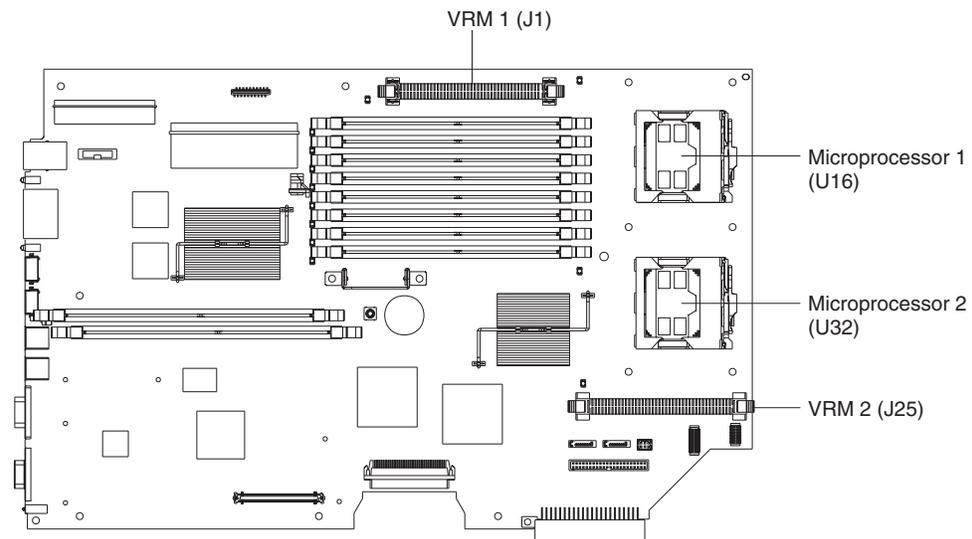


Figure 27. Location of microprocessor and VRM sockets

- If you install a second microprocessor in the server, microprocessor 1 is installed in microprocessor socket 1 (U16), and microprocessor 2 is installed in socket 2 (U32).

You must also install the following items that come with the second microprocessor:

- Voltage regulator module (VRM), which you plug into VRM connector J25
- Cooling fan, which you plug into fan position 4

Notes:

1. Read the documentation that comes with the microprocessor to determine whether you must update the basic input/output system (BIOS) code. The most current level of BIOS code for the server is available at <http://www.ibm.com/support/>.
2. A new microprocessor comes in a kit with a VRM, cooling fan, and a heat sink.

3. To use SMP, obtain an SMP-capable operating system (optional). For a list of supported operating systems, go to <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

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/servers/eserver/serverproven/compat/us/> for a list of microprocessors that the server supports.

Installing a microprocessor

Complete the following steps to install a microprocessor:

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Turn off the server and peripheral devices (see “Turning off the server” on page 10); then, and disconnect all power cords and external cables.
3. Remove the server cover.

Attention: When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For details about handling these devices, see “Handling static-sensitive devices” on page 16.

4. Touch the static-protective package that contains the new microprocessor to any *unpainted* metal surface on the server; then, remove the microprocessor from the package.
5. If you are installing a microprocessor in the microprocessor 2 socket, *first* install a VRM in the microprocessor 2 VRM slot (J-25)

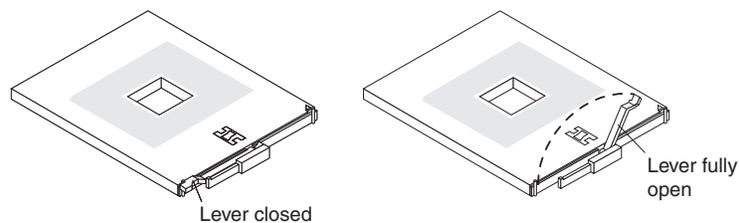


Figure 28. Microprocessor locking lever

6. Install the microprocessor:
 - a. 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).

Attention:

- Do not use excessive force when pressing the microprocessor into the socket.
- Center the microprocessor over the microprocessor socket. Align the triangle on the corner of the microprocessor with the triangle on the corner of the socket and carefully press the microprocessor into the socket before you try to close the lever.

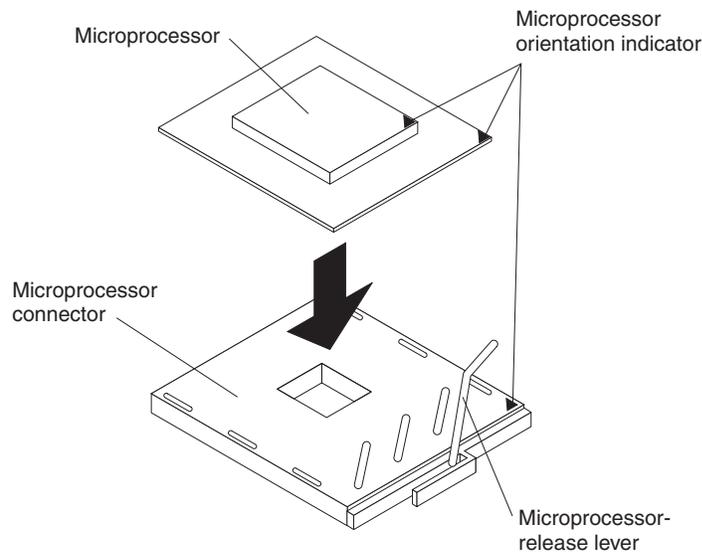


Figure 29. Microprocessor installation

7. Close the microprocessor-release lever to secure the microprocessor.

Attention:

- Do not set the heat sink down after you remove the plastic cover.
 - Do not touch or contaminate the thermal grease on the bottom of the new heat sink. Doing so damages its heat-conducting capability and exposes the new microprocessor to overheating.
 - If you must remove the heat sink after installing it, note that the thermal grease 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. Loosen one captive screw fully before loosening the other captive screw to help break the bond between the components without damaging them.
8. Remove the cover from the bottom of the heat sink and make sure that the thermal grease is still on the bottom of the heat sink.
 9. Install the heat sink on top of the microprocessor, and tighten the captive screws. Alternate between the screws until they are tight, making sure that you do not overtighten them.

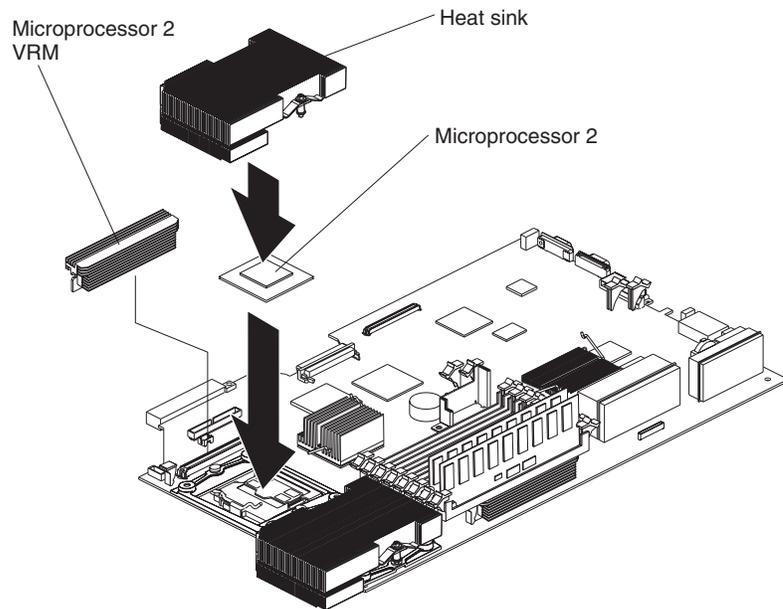


Figure 30. Heat sink installation

10. Install fan 4 into the proper location, in front of the second microprocessor.

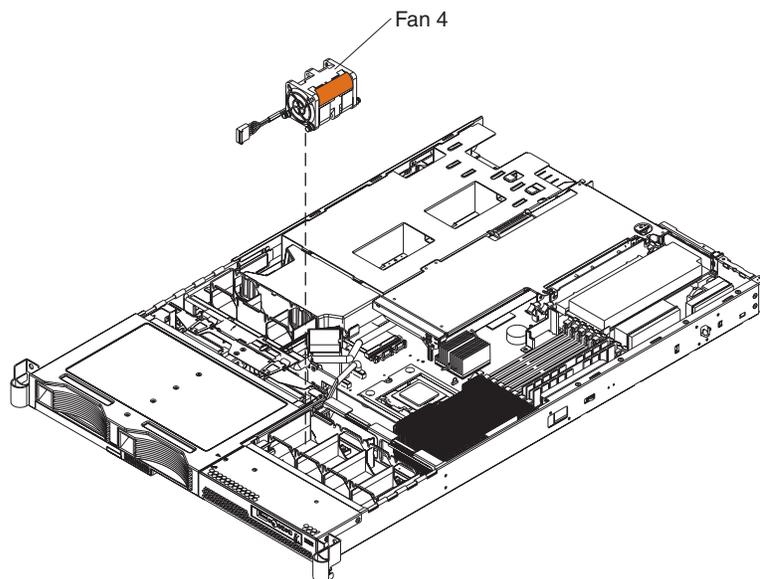


Figure 31. Installing fan 4 after installing a second microprocessor

- 11. If you have other options to install or remove, do so now.
- 12. Go to “Completing the installation” on page 47

Installing and removing a hot-swap power supply

The server supports a maximum of two hot-swap power supplies.

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.

The following information describes the type of power supply that the server supports and other information that you must consider when installing a power supply:

- The server comes with one 585-watt hot-swap power supply as standard. The input voltage is 110 VAC or 220 V ac auto-sensing.
- You can install an optional 585-watt hot-swap power supply to use as a redundant power supply.
- These power supplies are designed for parallel operation. In the event of a power supply failure, the redundant power supply continues to power the system. The number of power supplies supported per system are a maximum of two.
- See “Using Y power-cord connectors for power backup” on page 42 for information on how to properly connect Y power-cord connectors to back up power units.

Figure 32 shows the power-supply connectors and their associated LEDs on the back of the server.

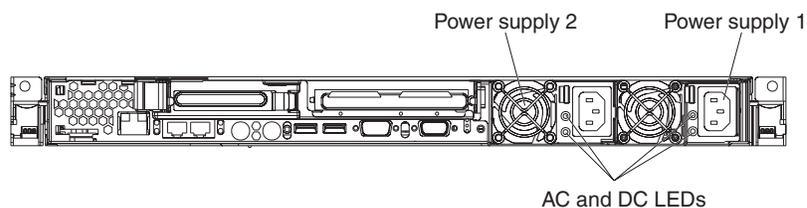


Figure 32. Power supply connectors and LEDs

Installing a power supply

Complete the following steps to install a hot-swap power supply:

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Remove the power-supply blank from the empty power-supply bay by inserting a coin or flat-tipped screwdriver into the slot in the middle of the power-supply blank. Pull the power-supply blank from the power-supply bay. Save the power-supply blank in case you remove the power supply at a later time.

Attention: During normal operation, each power-supply bay must have either a power supply or power-supply blank installed for proper cooling.

Figure 33 shows power-supply 1 and power-supply 2 with a blank cover and slot.

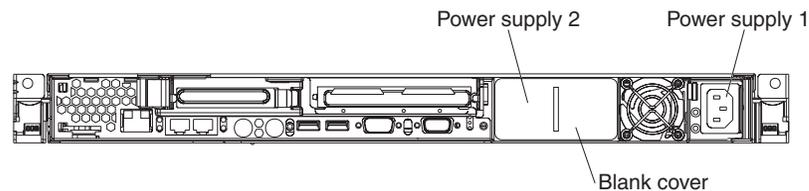


Figure 33. Blank cover, power supply 2

3. Install the power supply in the bay:
 - a. Rotate the handle down on the rear of the power supply to the open position, and then slide the power supply forward into the power-supply bay.
 - b. Gently lift the latch handle up until it clicks to securely seat the power supply in the bay.

Figure 34 shows how to install a power supply.

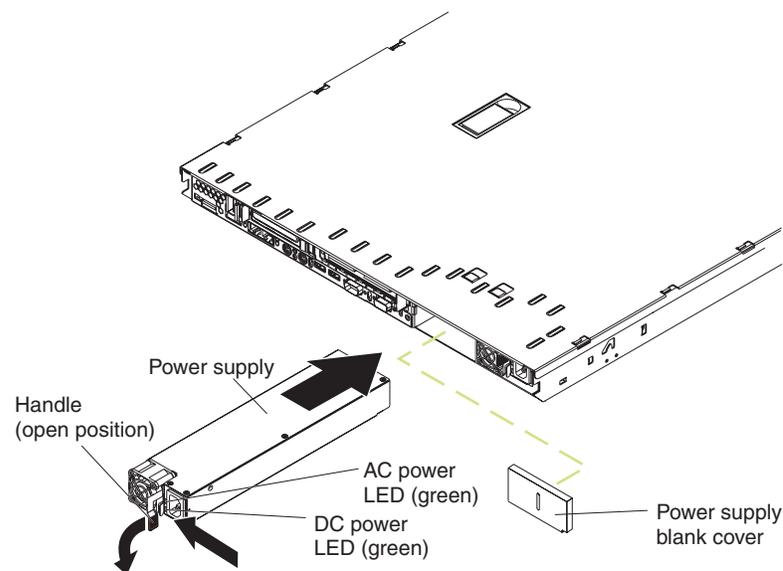


Figure 34. Power supply installation

4. Connect the power cord for the new power supply to the power-cord connector on the power supply.
5. Connect the power cord to a properly grounded electrical outlet.

6. Make sure that the power-supply fan starts and the ac power LED (top) and dc power LED (bottom) on the power supply are lit, indicating that the power supply is operating correctly. The two green LEDs are to the left of the power-cord connector.

Removing a power supply

To replace an existing power supply, you must remove the old one. Complete the following steps to remove a hot-swap power supply:

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Turn off the server and peripheral devices (see “Turning off the server” on page 10); then, and disconnect all power cords and external cables.
3. If the server is in a rack, at the back of the server, pull back the cable management arm to get access to the rear of the server to remove the power supply.
4. Remove the power cord.
5. From the rear of the sever, push left on the orange release lever and then push down to release the power-supply assembly and move the power supply back slightly for easy removal.
6. Pull the power supply all the way out of the power-supply bay.
7. Install a new power supply by following the instructions in “Installing a power supply” on page 41 or reinstall the blank cover, to keep the server from overheating.

Using Y power-cord connectors for power backup

When you have multiple servers with redundant power supplies, use Y power-cord connectors to provide the proper connection to the backup power-supply (Back-UPS) units. The Back-UPS unit provides temporary power to the connected devices in the case of a power outage in the network. The Back-UPS unit must be connected correctly to ensure optimum power backup to the servers.

Connect the Y power cord to two power supplies, in two different servers, then connect the other end of the Y power cord to a Back-UPS unit. Figure 35 on page 43 shows the connection between the servers with the Y power-cord.

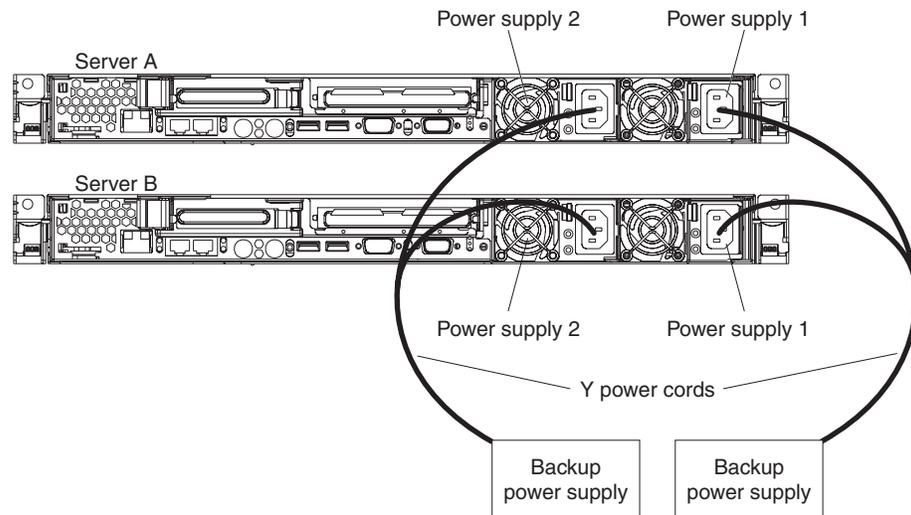


Figure 35. Using a Y power cord to connect two servers

This connection method provides the server with two different and independent backup power sources: one Back-UPS unit for power supply 1 on both servers and another Back-UPS unit for power supply 2 (redundant power supply) on both servers.

Replacing a hot-swap fan assembly

The following information describes information you must consider when installing a hot-swap fan.

Attention: To ensure proper server operation, replace a failed fan as soon as possible.

- The server comes with a maximum of seven hot-swap fans.

Note: If the server has one microprocessor it has six fans. If you install a second microprocessor, then an additional fan, fan 4, comes with the second microprocessor.

- Figure 36 on page 44 shows the locations of the hot-swap fans.

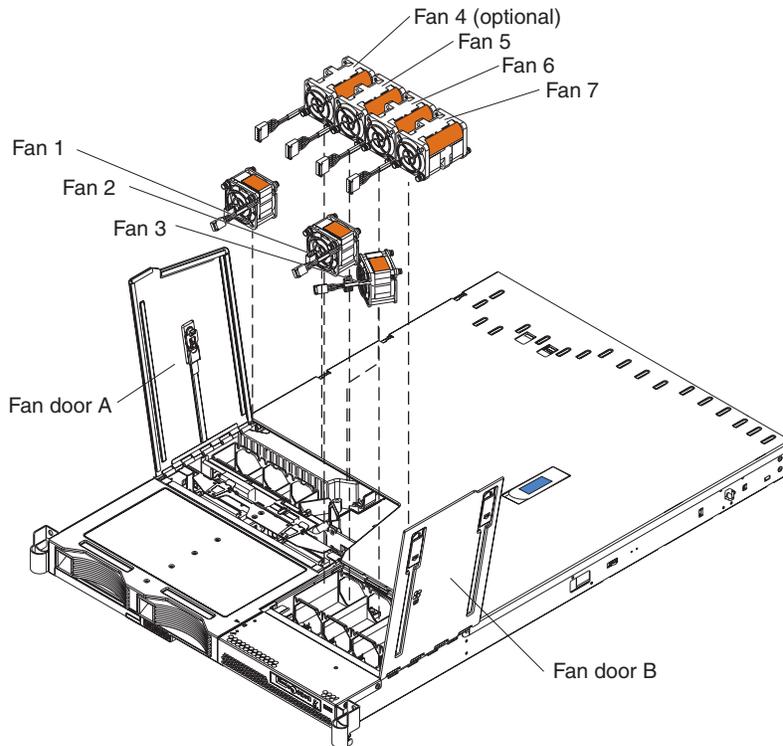


Figure 36. Hot-swap fan locations

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

1. Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Open the fan door for the failing fan. The LED near the connector of the failing fan assembly is lit.

Attention: To ensure proper system cooling, do not remove the top cover for more than 30 minutes during this procedure.
3. Disconnect the cable of the failing fan from the connector.
4. Pull up on the orange tab on the side of the failing fan.
5. Lift the fan out of the server.
6. Orient the new fan in the same position as the fan you removed. Make sure that the airflow indicator, on top of the fan, is pointing to the rear of the server.
7. Push the fan assembly down into the server until the blue grommets are correctly seated.
8. Connect the cable of the replacement fan into the connector.
9. Close the fan door.
10. Go to “Completing the installation” on page 47.

Replacing the battery

The following information describes information that you must consider when replacing the battery:

- IBM has designed this product with your safety in mind. The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.

Note: In the U. S., call 1-800-IBM-4333 for information about battery disposal.

- If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.
- 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.

Note: After you replace the battery, you must reconfigure the server and reset the system date and time.

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 Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
2. Follow any special handling and installation instructions supplied with the battery.
3. Turn off the server and all attached devices and disconnect all power cords and external cables (see “Turning off the server” on page 10); then, remove the server cover (see “Removing the cover” on page 18).
4. Disconnect any internal cables, as necessary.

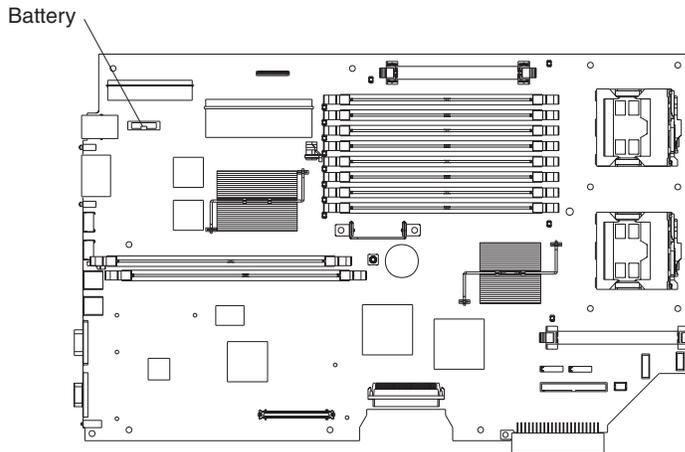


Figure 37. Battery location

5. Locate the battery (connector BH1) on the system board.
6. Remove the battery:
 - a. Use one finger to pull the retainer tab that secures the battery to its housing.
 - b. Use one finger to slide the battery up and out from its socket.

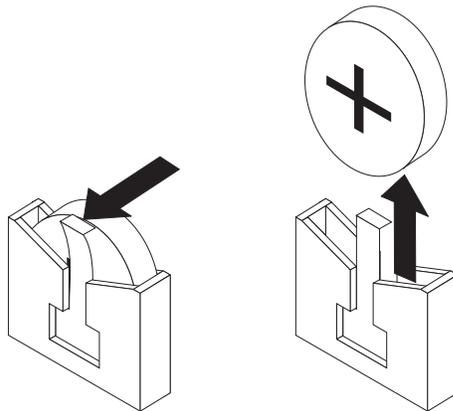


Figure 38. Battery removal

7. Insert the new battery:
 - a. Hold the battery so that the plus side of the battery is facing toward the center of the server, toward slots 1 and 2.
 - b. Pull the retainer tab out of the way so that you can slide the battery into its socket.
 - c. Slide the battery down until it snaps into place.
8. Reconnect the internal cables that you disconnected.
9. Reinstall the server cover (see “Installing the cover” on page 19).
10. Connect all external cables and all power cords.
11. Start the Configuration/Setup Utility program and set configuration parameters as needed (see “Starting the Configuration/Setup Utility program” on page 13). See the *User's Guide* on the IBM xSeries Documentation CD for additional information about using the Configuration/Setup Utility program.

Completing the installation

Complete the following steps to complete the installation:

1. Install the server cover (see “Installing the cover” on page 19).
2. Connect the cables and power cords (see “Connecting the cables”).
3. If you have added or removed hardware from the server, update the server configuration as necessary (see “Starting the Configuration/Setup Utility program” on page 13). See the *User’s Guide* on the IBM xSeries Documentation CD for additional information about using the Configuration/Setup Utility program.

Connecting the cables

The following illustrations show the locations of the input and output connectors on the server. Detailed cabling instructions are in the *Rack Installation Instructions* that come with the server.

Notes:

1. You must turn off the server before connecting cables to or disconnecting any cables from the server (see “Turning off the server” on page 10).
2. See the documentation that comes with the options for additional cabling instructions. It might be easier for you to route cables before you install certain options.
3. Cable identifiers are printed on the cables that come with the server and options. Use these identifiers to connect the cables to the correct connectors.

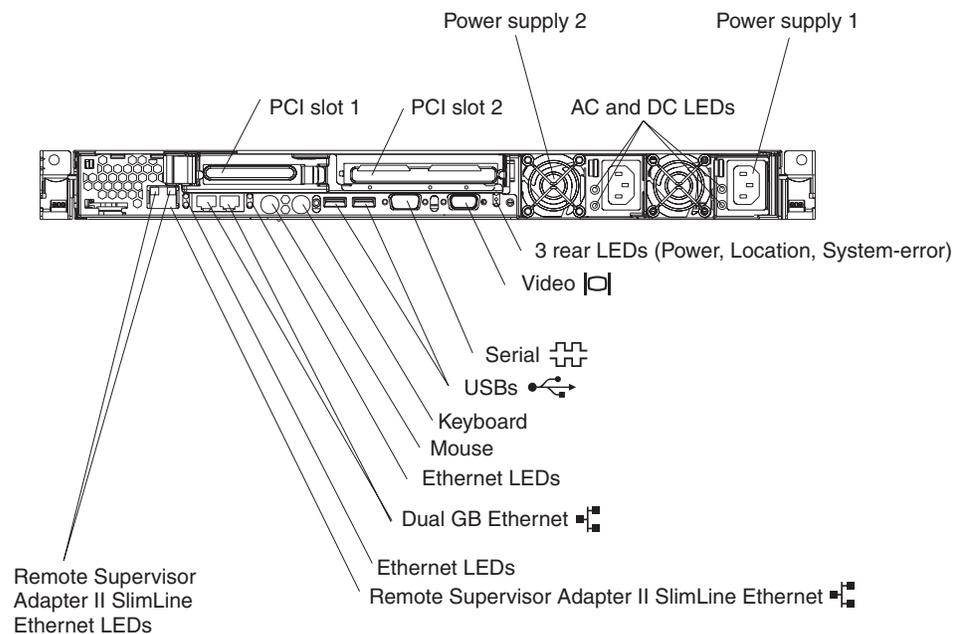


Figure 39. Cable identifiers, rear view of server

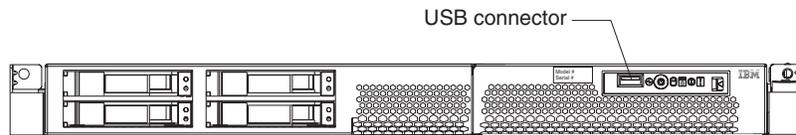


Figure 40. Front USB connector location

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 the section about 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. 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 IBM *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.

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

Installing the server in a rack

Detailed cabling instructions for a typical rack server configuration are provided on the IBM *xSeries Documentation CD* that come with the server. These instructions also come with the Tower-to-Rack Conversion Kit.

Input/output connectors

The server has the following input/output (I/O) connectors:

- Three Ethernet controller connectors
- One auxiliary-device (pointing device) connector
- One keyboard
- Three Universal Serial Bus (USB) one front and two rear
- One serial
- One video
- One low-profile adapter (slot 1)
- One adapter (any type) (slot 2)

Figure 41 shows the location of the USB connector on the front of the server.

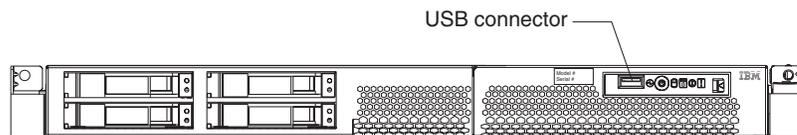


Figure 41. Front USB connector location

Figure 42 shows the locations of the connectors on the rear of the server.

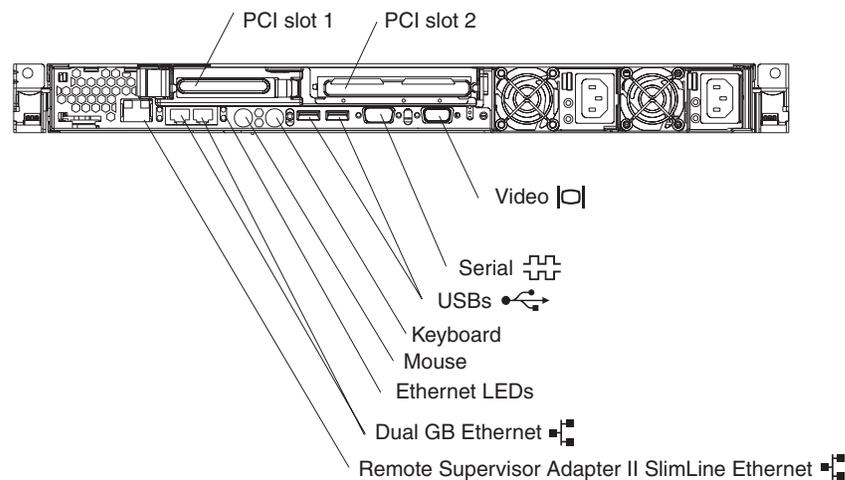


Figure 42. Cable identifiers, rear view of server

Note: If an optional Remote Supervisor Adapter II SlimLine is installed on the system board, the server has a dedicated Ethernet connector (Remote Supervisor Adapter II SlimLine Ethernet) on the rear of the server. See the documentation that comes with the Remote Supervisor Adapter for more information.

The following sections describe these connectors.

Auxiliary-device (pointing device) connector

Use this connector to connect a mouse or other pointing device. Figure 43 shows an auxiliary-device connector.

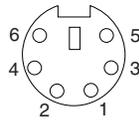


Figure 43. Auxiliary-device connector

Ethernet connectors

Figure 44 shows an Ethernet connector.

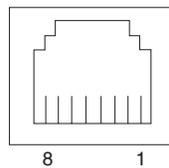


Figure 44. Ethernet connector

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.

Notes:

1. The server has three Ethernet connectors. Two of the Ethernet connectors are attached to the Ethernet controllers. See the *IBM xSeries 336 Type 8837 User's Guide* on the *IBM xSeries Documentation CD* for more information about the Ethernet controllers.
2. The third Ethernet connector is a dedicated connector that is active only when you install an optional Remote Supervisor Adapter II SlimLine. This dedicated connector is the Remote Supervisor Adapter II SlimLine Ethernet connector.

Keyboard connector

Use this connector to connect a PS/2 (non-USB) keyboard to the server. Figure 45 shows a keyboard connector.

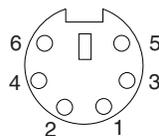


Figure 45. Keyboard connector

If you attach a keyboard to this connector, USB ports and devices are disabled during POST.

Serial connector

Use a serial connector to connect a serial device. Figure 46 shows a serial connector.

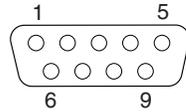


Figure 46. Serial connector

Universal Serial Bus connector

Use a Universal Serial Bus (USB) connector to connect a USB device. The USB ports support both USB 1.0, 1.1 and 2.0. The following table contains the speeds and cable lengths that USB 1.0, 1.1, and 2.0 support.

	USB 1.0/1.1	USB 2.0
Speed	12 Mbps	480 Mbps
Maximum cable length	3.0m (low speed)	3.0m (low speed)
	5.0m (high speed)	5.0m (high speed)

Using Plug and Play technology, USB devices are configured automatically and can interface with a maximum of 127 devices. Figure 47 shows a USB connector.

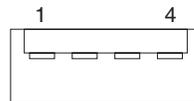


Figure 47. USB connector

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, the USB keyboard port is 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.

Video connector

Use this connector to connect a monitor to the server. The connector is dark blue to help you identify it. Figure 48 shows a video connector.

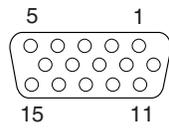


Figure 48. Video connector

Chapter 4. Service replaceable units

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Removing the system board	64

This chapter describes procedures for removing and installing certain components inside the server. Only a qualified service technician is authorized to replace the components described in this section.

Important: The field replaceable unit (FRU) procedures are intended for trained servicers who are familiar with IBM xSeries products. See the parts listing in “System replaceable units” on page 122 to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU.

Removing a microprocessor and heat sink

Note:

- Read “Installation guidelines” on page 15.
- Read the safety notices at Appendix B, “Safety information,” on page 129.
- Read “Handling static-sensitive devices” on page 16.

Complete the following steps to remove a microprocessor and heat sink:

1. Turn off the server and all attached peripheral devices.
2. Disconnect all power cords and external cables from the back of the server.
3. If necessary, remove the server from the rack; then, remove the server cover (see “Removing the cover” on page 18).

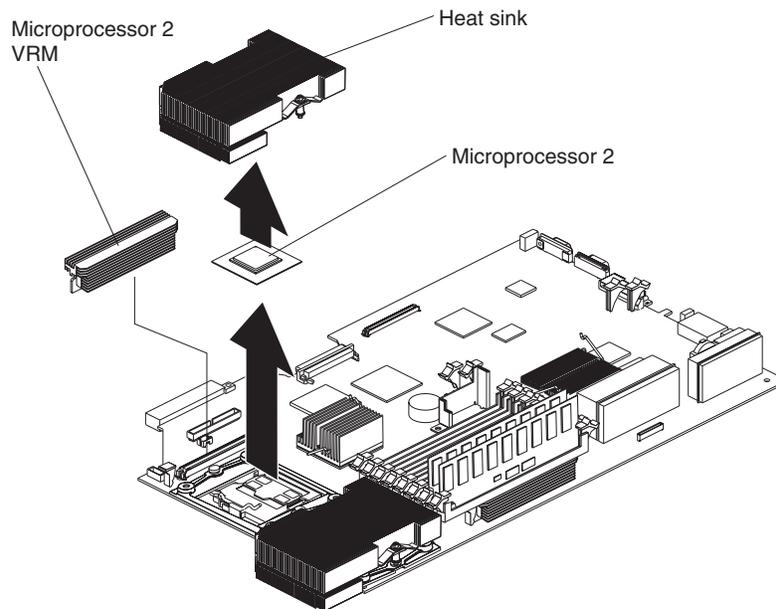


Figure 49. Microprocessor removal

4. Loosen one captive screw fully before loosening the other captive screw (this helps to break the bond between the heat sink and the microprocessor). After the captive screws are loosened, then remove the heat sink.

Note: It might be necessary to gently twist the heat sink to loosen it from the microprocessor.

Important: Be careful when handling the microprocessor and heat sink. If the thermal grease between the microprocessor and heat sink will be reused, do not contaminate it. If replacement thermal grease is provided with the replacement part, be sure to remove all traces of existing thermal grease from the remaining part before applying the new thermal grease.

5. Rotate the microprocessor socket lever arm upward to its maximum vertical position (135°).
6. Remove the microprocessor from the socket.

Operator information panel

Note:

- Read “Installation guidelines” on page 15.
- Read the safety notices at Appendix B, “Safety information,” on page 129.
- Read “Handling static-sensitive devices” on page 16.

Complete the following steps to remove the operator information panel:

1. Turn off the server.
2. Disconnect all power cords and external cables from the back of the server.
3. If necessary, remove the server from the rack; then, remove the server cover (see “Removing the cover” on page 18).
4. Press the operator panel release latch to slide it out of the server.

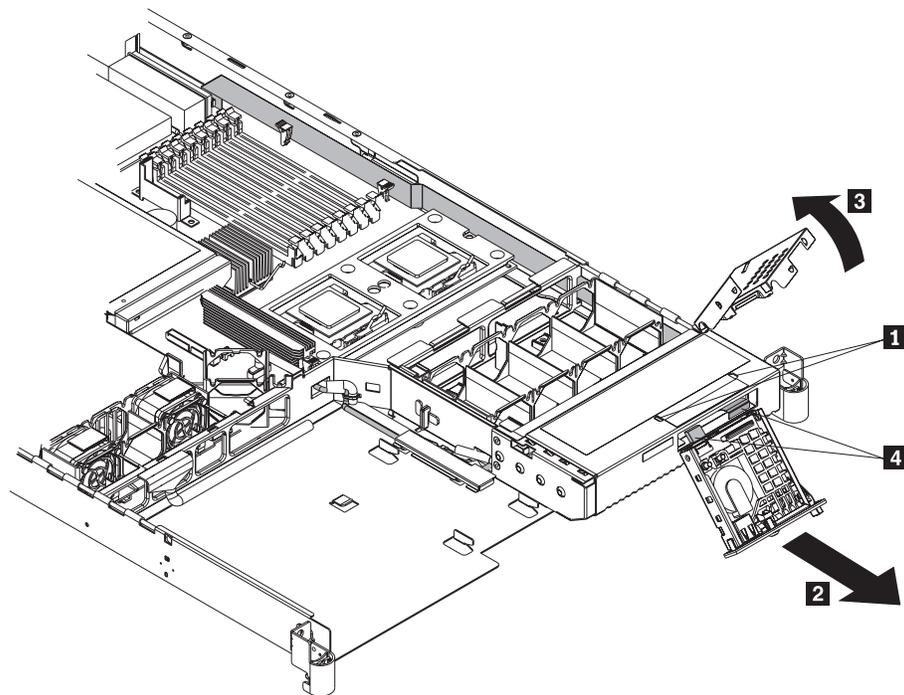


Figure 50. Operator information panel removal

5. Use a small screwdriver to push in the retention springs on the sides of the operator information panel assembly (**1**).
6. Slide the assembly forward (**2**) and out of the server.
7. Push out on the two sides of the assembly cover to flare it out.
8. Rotate the assembly cover up and off of the operator information panel assembly (**3**).
9. Unplug the two cables from the rear of the assembly (**4**).
10. Pull the assembly forward to remove it from the server.

To replace the operator information card, reverse the removal procedure, connecting the two cables to the rear of the card and sliding it under the tabs on the chassis until it is firmly anchored.

Fan bracket

Note:

- Read “Installation guidelines” on page 15.
- Read the safety notices at Appendix B, “Safety information,” on page 129.
- Read “Handling static-sensitive devices” on page 16.

Complete the following steps to remove the fan brackets:

1. Turn off the server and all attached peripheral devices.
2. Disconnect all power cords and external cables from the back of the server.
3. If necessary, remove the server from the rack; then, remove the server cover (see “Removing the cover” on page 18).

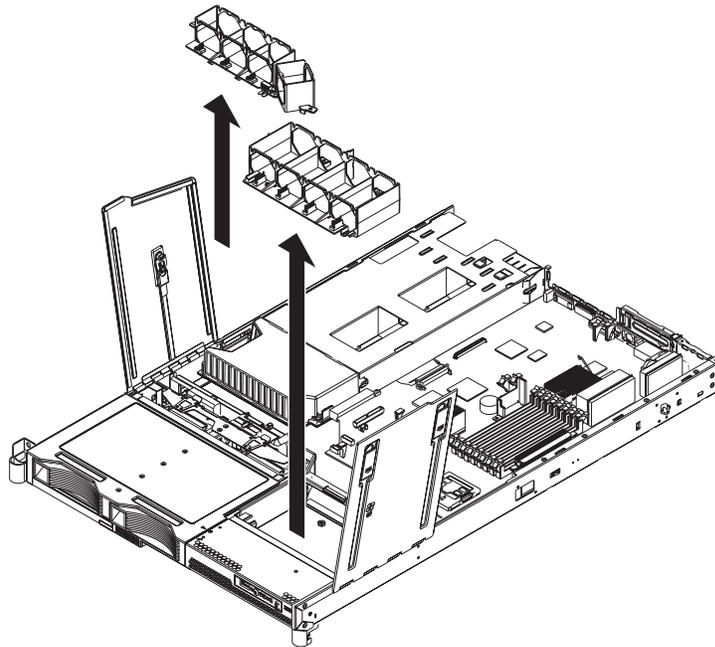


Figure 51. Fan bracket removal

4. Unplug the fans from the system board.
5. Remove the fans from the system (see “Replacing a hot-swap fan assembly” on page 43).
6. Remove the screws and set them in a safe place.
7. Disconnect the fan cable.
8. Pull the fan bracket out of the server.

To install the fan brackets, reverse this procedure.

Note: When reinstalling the fan brackets on the front right side of the server, remove the drive tray assembly (see “Drive tray assembly” on page 57) and the fan cable cover. Pull the cable loose before plugging it into the fan power distribution board on the fan bracket, then install the fan bracket in the server.

Drive tray assembly

Note:

- Read “Installation guidelines” on page 15.
- Read the safety notices at Appendix B, “Safety information,” on page 129.
- Read “Handling static-sensitive devices” on page 16.

Complete the following steps to remove the drive tray assembly:

1. Turn off the server and all attached peripheral devices.
2. Disconnect all power cords and external cables from the back of the server.
3. If necessary, remove the server from the rack; then, remove the server cover (see “Removing the cover” on page 18).

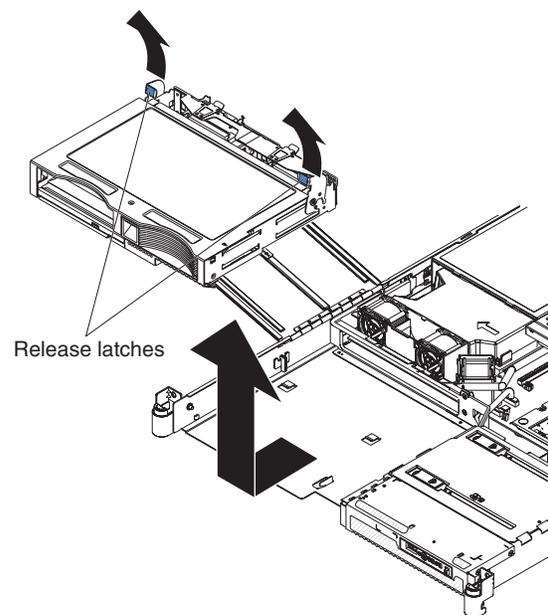


Figure 52. Drive tray assembly removal

4. Remove the drives from the server (see “Hard disk drives” on page 26).
5. Lift up on the two blue levers on the rear of the drive tray to release it from the server.
6. Slide the drive tray assembly forward.
7. Unplug the cables from the rear of the drive tray assembly.
8. Unplug the DVD cable from the system board and remove it from the server.
Attention: When you remove the cable from the server:
 - Make sure that the cable does not snag on any server component.
 - Note the routing of the cable for later reinstallation.
9. Lift the drive tray assembly out of the server.

Front panel signal and USB cables

Note:

- Read “Installation guidelines” on page 15.
- Read the safety notices at Appendix B, “Safety information,” on page 129.
- Read “Handling static-sensitive devices” on page 16.

Complete the following steps to remove the front panel signal (flat) cable.

1. Turn off the server and all attached peripheral devices.
2. Disconnect all power cords and external cables from the back of the server.
3. Remove the server from the rack; then, remove the server cover (see “Removing the cover” on page 18).
4. Remove the operator information panel (see “Operator information panel” on page 55).
5. Remove the front fan bracket and set it to the side (see “Fan bracket” on page 56). (It is not necessary to remove the fans from the bracket for this procedure.)
6. Remove the heat sink (see “Removing a microprocessor and heat sink” on page 54) from microprocessor 1 on the far right of the server (see “System-board option connectors” on page 60).
7. Remove the VRM associated with the heat sink you just removed.
8. Note the routing of the signal cable as you remove it from the server. It is attached to the server with hook-and-loop fasteners in various locations.

To install the signal cable, reverse this procedure making sure to line up the hook-and-loop fasteners in the appropriate locations.

Complete the following steps to remove the front panel USB cable.

1. Remove the drive cage and note the routing of the USB cable.
2. Remove the USB cable from behind the retention tab, found under the drive tray assembly.
3. Unplug the cable from the system board, then pull the cable through the openings to remove it.

To install the USB cable, reverse these instructions.

Power backplane

Note:

- Read “Installation guidelines” on page 15.
- Read the safety notices at Appendix B, “Safety information,” on page 129.
- Read “Handling static-sensitive devices” on page 16.

Complete the following steps to remove the power backplane:

1. Turn off the server and all attached peripheral devices.
2. Disconnect all power cords and external cables from the back of the server.
3. Remove the server from the rack; then, remove the server cover (see “Removing the cover” on page 18).

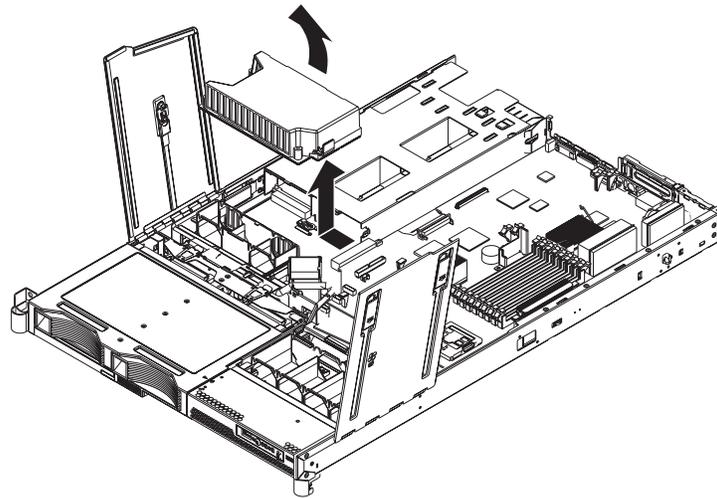


Figure 53. Power backplane removal

4. Disconnect the power supplies from the power backplane (see “Removing a power supply” on page 42).
5. Slide the power backplane to the left, disconnecting it from the system board.
6. Remove the power backplane from the server.

To install the power backplane, reverse this procedure.

System board

This section contains service information for the system board.

System-board option connectors

Figure 54 shows the connectors on the system board for user-installable options.

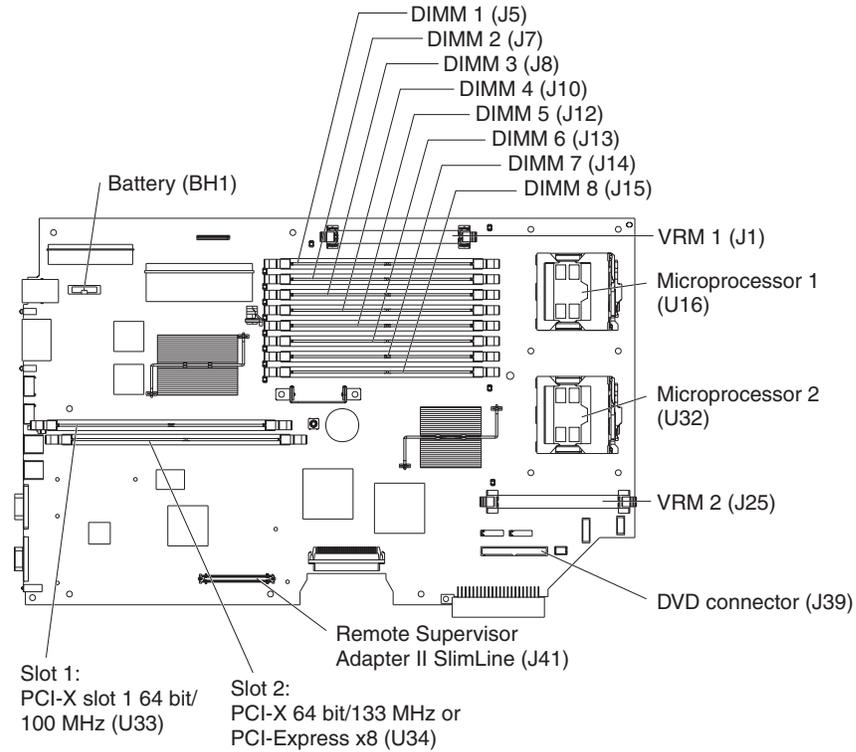


Figure 54. System-board option connectors

System-board internal connectors

Figure 55 shows the internal connectors on the system board.

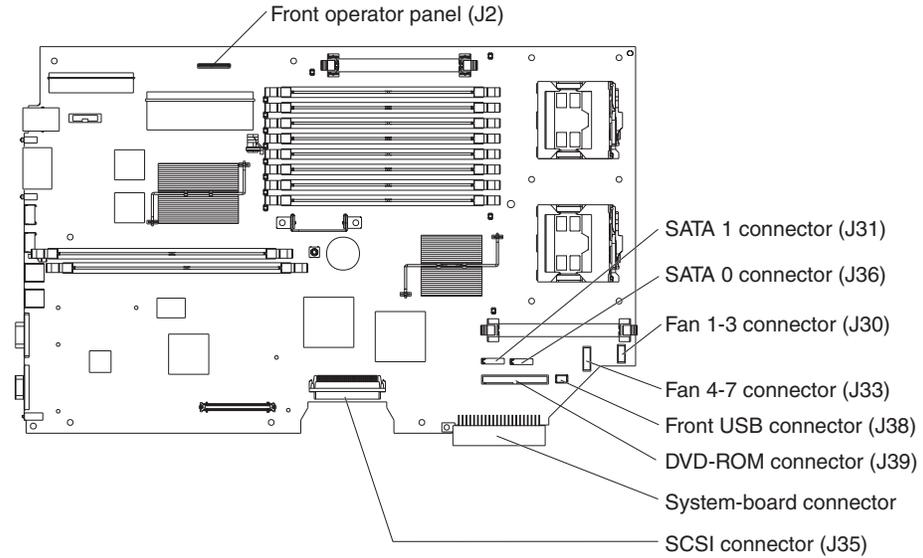


Figure 55. System-board internal connectors

System-board external connectors

Figure 56 shows the external input/output connectors on the system board.

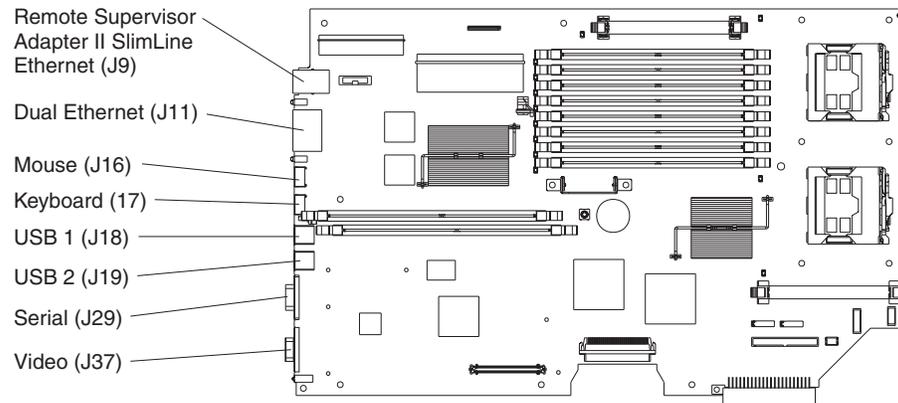


Figure 56. System-board external connectors

System-board jumpers

Figure 57 shows the location of the jumper blocks on the system board.

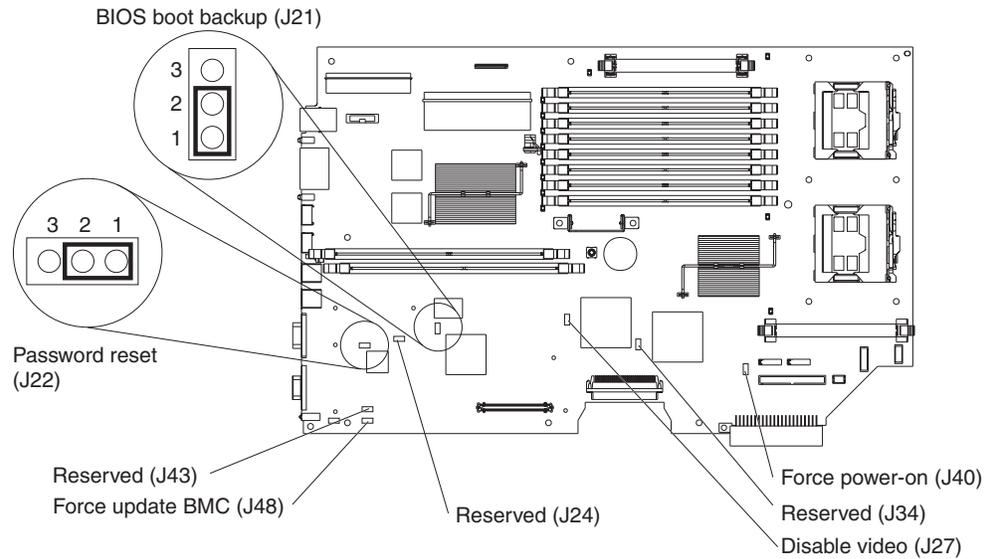


Figure 57. System-board jumpers

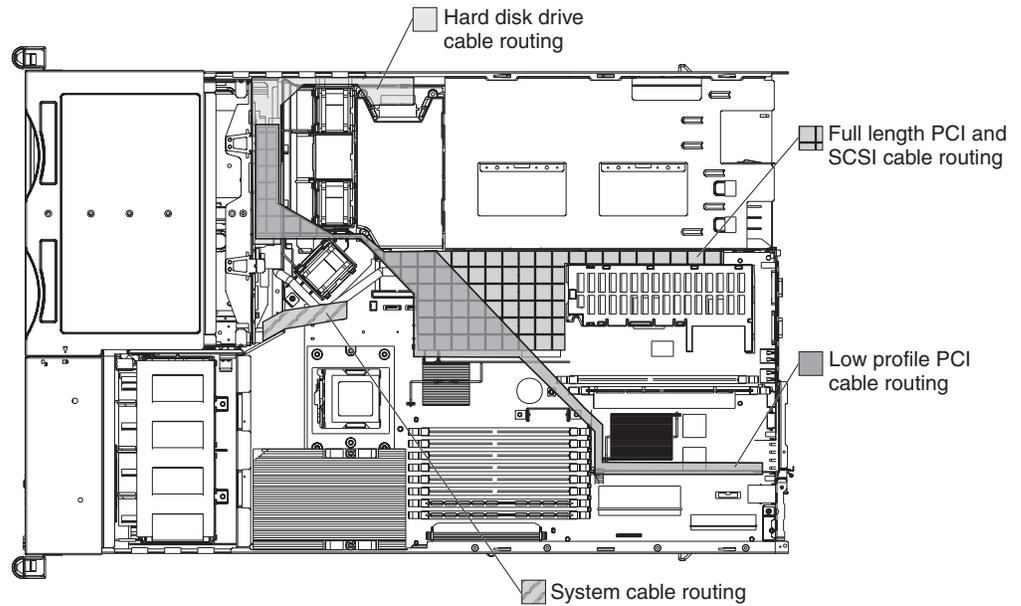
Table 4. System board jumpers

Jumper	Default position
J21 (BIOS boot page)	Pins 1 and 2
J22 (password override)	Pins 1 and 2
J27 (disable video)	No jumper
J40 (force power-on)	No jumper
J48 (force-update BMC)	No jumper

Note: Jumpers not illustrated or described are reserved.

System-board cable channels

The following illustration shows the cable channels on the system board where you should route the cables from user-installable options.



Removing the system board

Note:

- Read “Installation guidelines” on page 15.
- Read the safety notices at Appendix B, “Safety information,” on page 129.
- Read “Handling static-sensitive devices” on page 16.

Complete the following steps to remove the system board:

1. Turn off the server and any attached devices.

Note: When replacing the system 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.

2. Disconnect power cords and external cables from the back of the server.
3. Remove the server from the rack.
4. Remove the cover (see “Removing the cover” on page 18).
5. Remove all adapters, including the Remote Supervisor Adapter II SlimLine, if installed (see “Working with adapters” on page 20).
6. Disconnect all cables from the system board.
7. Remove all heat sinks, microprocessors, and VRMs and set them aside on a static-protected surface for reinstallation (see “Installing a microprocessor” on page 37).
8. Remove the memory modules and set them aside on a static-protected surface for reinstallation (see “Installing memory modules” on page 34).

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

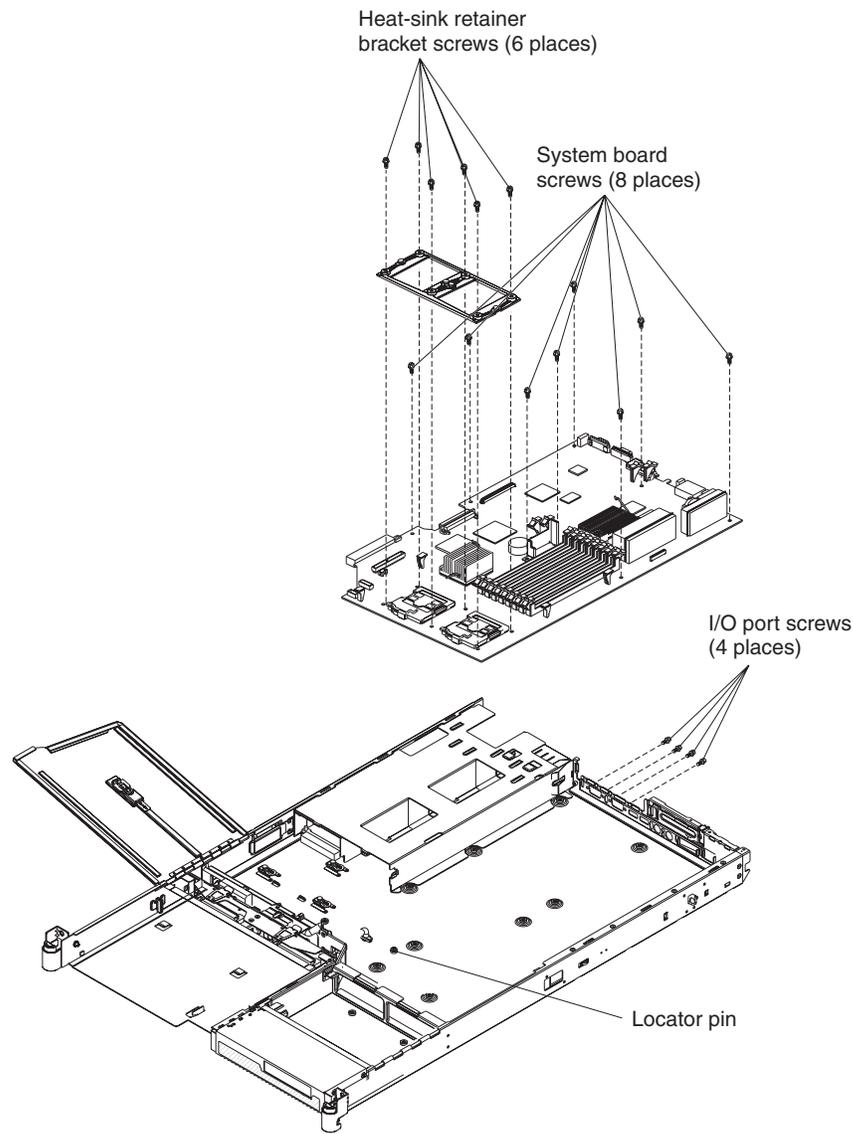


Figure 58. System board removal

9. Disconnect the power backplane; then, slide it to the side and set it out of the way (see "Power backplane" on page 59).
10. Remove the six screws securing the two heat sink retention modules to the system board. These six screws also secure the system board to the chassis.
11. Remove the eight screws on the system board that secure the system board to the chassis.
12. Remove the four stand-off screws from the rear of the server.
13. Lift the system board slightly so that it disengages from the locator pin.
14. Slide the system board slightly toward the front of the server.
15. Lift up the left side of the system board.
16. Lift the rest of the system board and carefully remove it from server, being careful not to disturb any surrounding components.
17. To reinstall the board, place it carefully into position under the small ledge on the right side of the server, then put it down and slide it to the rear of the server. Ensure the locator pin engages the locator hole in the system board.

18. Reverse steps 5 on page 64 through 12 on page 65 to replace the components that were removed.

Note: When reassembling the components in the server, be sure to route all cables carefully so that they are not exposed to undue pressure.

Chapter 5. Diagnostics

This section 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 section, see Appendix A, “Getting help and technical assistance,” on page 127 for more information.

General checkout

Follow the checkout procedure (see “Checkout procedure” on page 68) for diagnosing hardware problems. Review the following information before performing the checkout procedure:

- Read Appendix B, “Safety information,” on page 129.
- The server diagnostic programs are stored in upgradeable read-only memory (ROM) on the system board. These programs provide the primary methods of testing the major components of the server. If you are not sure whether a problem is caused by the hardware or by the software, you can run the diagnostic programs (see “Diagnostic programs, error codes, and messages” on page 70) to confirm that the hardware is working correctly.
- When you run the diagnostic 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 diagnostic programs.
- Before running the diagnostic 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 diagnostic 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. For servers that are part of a shared hard disk drive cluster, run one test at a time. Do not run any suite of tests, such as “quick” or “normal” tests, because this could enable the hard disk drive diagnostic tests.
 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 diagnostic programs.
 3. If the server is suspended and a POST error code is displayed, see “POST error codes” on page 88.
 4. If the server is suspended and no error message is displayed, see “Error symptoms” on page 103 and “Undetermined problems” on page 119.
 5. For information about power-supply problems, see “Power checkout” on page 79.
 6. For intermittent problems, check the error logs; see “Diagnostic programs, error codes, and messages” on page 70.

Checkout procedure

Complete the following steps to perform the checkout procedure:

001 IS THE SERVER PART OF A CLUSTER?

YES. Schedule maintenance for the system. Shut down all systems related to the cluster. Run the storage test.

NO. Go to step **002**.

002 IF THE SERVER IS NOT PART OF A CLUSTER:

1. Check the power supply LEDs, see “Hot-swap power-supply LED errors” on page 96.
2. Turn off the server and all external devices.
3. Check all internal and external devices for compatibility at <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.
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. Record any POST error messages that are displayed on the screen. If an error is displayed, look up the first error in “POST error codes” on page 88.
9. Check the operator information panel system-error LED; if it is on, see “Light path diagnostics errors” on page 93.
10. Check the system-error log and the BMC log.

Note: The system-error log on the xSeries 336 server is available only with the Remote Supervisor Adapter II SlimLine.

If an error was recorded by the server, see Chapter 6, “Symptom-to-FRU index,” on page 83.

11. Start the diagnostic programs.
12. Check for the following responses:
 - One beep
 - Readable instructions or the main menu

003 DID YOU RECEIVE BOTH OF THE CORRECT RESPONSES?

NO. Find the failure symptom in Chapter 6, “Symptom-to-FRU index,” on page 83.

YES. Run the diagnostic programs (see “Diagnostic programs, error codes, and messages” on page 70).

If you receive an error, see Chapter 6, “Symptom-to-FRU index,” on page 83.

If the diagnostic programs were completed successfully and you still suspect a problem, see “Undetermined problems” on page 119.

Diagnostic tools overview

The following tools are available to help you identify and resolve 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”).

The POST error log contains the three most recent error codes and messages that the system has generated during POST.

The system-error log contains all the error messages that were issued during POST.

Note: The system-error log on the xSeries 336 server is available only with the Remote Supervisor Adapter II SlimLine.

- **Diagnostic programs and error messages**

The server diagnostic programs, stored in upgradable read-only memory (ROM) on the system board, are the primary method of testing the major components of the server (see “Diagnostic programs, error codes, and messages” on page 70).

- **ServerGuide error symptoms**

ServerGuide error symptoms are described at “ServerGuide error symptoms” on page 110.

- **SCSI error messages**

For information on SCSI errors, see “Small computer system interface messages” on page 72 and “SCSI error codes” on page 115.

- **Light path diagnostics**

The server has light-emitting diodes (LEDs) to help you identify problems with server components. By following the light path, you can identify the type of problem that occurred. The light path begins with the LEDs on the operator information panel (see “Light path diagnostics” on page 73).

- **Error symptom tables**

These tables list problem symptoms, along with suggested steps to correct the problems (see the “Error symptoms” on page 103).

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 or application program appears.

If POST detects a problem, more than one beep sounds, an error message appears on the screen, or both (see “Beep symptoms” on page 84 and “POST error codes” on page 88).

Note: 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 the system generated during POST.

The system-error log or the BMC log contains all messages that were issued during POST and all system status messages from the service processor.

Note: The system-error log on the xSeries 336 server is available only with the Remote Supervisor Adapter II SlimLine.

You can view the contents of the system-error log and the BMC log from the Configuration/Setup Utility program; you can also view the system-error log from the diagnostic programs.

Viewing error logs from the Configuration/Setup Utility program

The POST error log and the BMC log are viewed from the Configuration/Setup Utility program.

To view the POST error log, start the Configuration/Setup Utility program (see “Starting the Configuration/Setup Utility program” on page 13); then, select **Error Logs** from the main menu.

To view the BMC log, start the Configuration/Setup Utility program; then, select **Advanced Settings** from the main menu. In the menus that follow, select **BMC Configuration**; then, select **BMC Error Log**.

Viewing the system-error log from diagnostic programs

To view system-error log from the diagnostic programs, complete the following steps:

1. Start the diagnostic programs (see “Starting the diagnostic programs” on page 71).
2. Select **Hardware Info** from the top of the diagnostic programs screen.
3. Select **System Error Log**.

Then, follow the instructions on the screen.

Note: The system-error log on the xSeries 336 server is available only with the Remote Supervisor Adapter II SlimLine.

Diagnostic programs, error codes, and messages

The server diagnostic programs are stored in upgradeable read-only memory (ROM) on the system 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.

Error codes that might be displayed are listed at “Diagnostic error codes” on page 97.

Notes:

1. Depending on the server configuration, some of the error codes might not appear when you run the diagnostic programs.
2. If diagnostic error codes appear that are not listed in the tables, make sure that the server has the latest levels of BIOS, Remote Supervisor Adapter II SlimLine, and ServeRAID code installed.

Diagnostic text message format

The diagnostic text message format is as follows:

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 hardware failure did not occur; the test could not be run because of some other problem (for example, there might be a configuration problem, the hardware is missing or is not being recognized, or there is a hardware problem that is not related to the hardware currently being tested).

test_specific_string

is an error code or other information about the error.

Starting the diagnostic programs

Complete the following steps to start the diagnostic programs:

1. Turn off the server and any peripheral devices.
2. Turn on all attached devices; then, turn on the server.

Note: To run the diagnostic programs, you must start the server with the highest level password that is set. That is, if an administrator password is set, you must enter the administrator password, not the user password, to run the diagnostic programs.

3. When the prompt F2 for Diagnostics appears, press F2.
4. Type the appropriate password; then, press Enter.
5. Select either **Extended** or **Basic** from the top of the screen.
6. When the diagnostic programs screen appears, select the test you want to run from the list that appears; then, follow the instructions on the screen.

Notes:

- a. 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 the help information and return to where you left off, press Esc.
- b. 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.
- c. The keyboard and mouse (pointing device) tests assume that a keyboard and mouse are attached to the server.
- d. If you run the diagnostic programs with either no mouse or a USB 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.
- e. You can test the USB keyboard by using the regular keyboard test. The regular mouse test can test a USB mouse. Also, you can run the USB interface test only if there are no USB devices attached.
- f. 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 errors but the problem persists 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.

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**. You can save the test log to a file on a diskette or to the hard disk.

The test-log data is maintained only while the diagnostic programs are active. When you exit from the diagnostic programs, the test log is cleared (saved test logs are not affected). To save the test log to a file on a diskette or to the hard disk 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.

Note: 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.

For descriptions of the error messages that might appear when you run the diagnostic programs, see “Diagnostic error codes” on page 97.

Small computer system interface messages

If you receive a SCSI error message, see “SCSI error codes” on page 115.

Note: If the server does not have a hard disk drive, ignore any message that indicates that the BIOS is not installed.

Light path diagnostics

The server's light path diagnostics feature provides a path that can be followed 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. The LEDs are viewed in the following order:

1. Begin on the front panel.
2. Proceed to the light path diagnostics panel.
3. Check the system service label.
4. Look inside the server, if necessary.

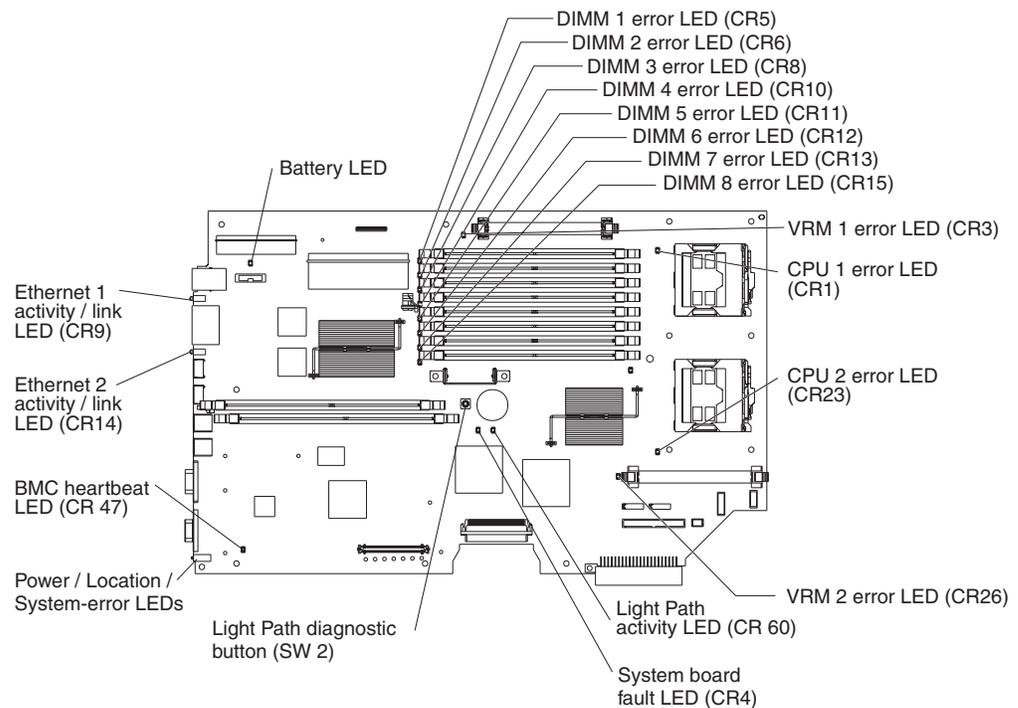


Figure 59. System-board LEDs

Many errors are first indicated by the illumination of the system-error light in the operator information panel on the front of the server (see “Server controls and LEDs” on page 6). If the system-error light is lit, one or more lights inside the server (see Figure 59) might also be lit that can direct you to the source of the error.

Complete the following steps to view the LEDs.

Note: Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.

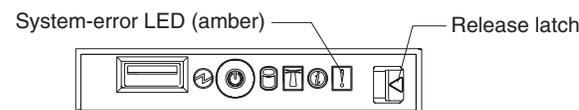


Figure 60. System-error LED

1. Check the system-error LED on the operator information panel on the front of the server. A lit system-error LED indicates that a problem exists.



Figure 61. Release latch for light path diagnostics panel

2. Check the light path diagnostics panel. Press the release latch on the operator information panel; then, slide out the light path diagnostics panel to view the lit LEDs. These LEDs indicate the type of error that has occurred and are described in more detail at “Light path diagnostics errors” on page 93.

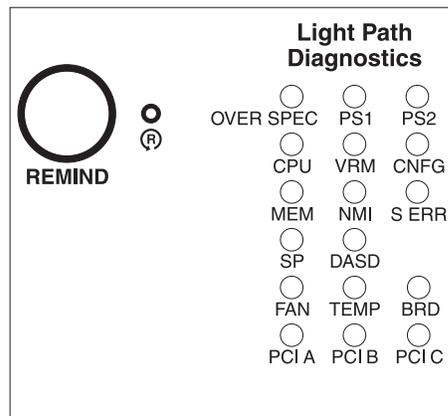


Figure 62. Light path diagnostics panel

3. Once you know the general type of error and the general location of the component involved, the next step is to check the system service label on the outside of the server.

This label gives an overview of internal components that correspond to many of the LEDs on the light path diagnostics panel and can help to view lit LEDs inside the server.

Note: Some of the LEDs on the light path diagnostics panel will not have a corresponding LED lit on the system board. For example:

- LEDs for the power supplies and hard disk drives are located on or near the individual power supply or hard disk drive.
- Some error conditions are corrected by taking an action not related to one particular component; see step 5 on page 75.

4. If the lit LED on the light path diagnostics panel refers to a specific internal component as indicated in step 3, look inside the server to check the lit LEDs on the system board (see Figure 59 on page 73). For example, a microprocessor error will light the LED next to the failing microprocessor.
 - a. To view LEDs inside the server without turning off the server, read “Working inside the server with the power on” on page 15; then, remove the cover and look for any lit error LEDs.
 - b. To view LEDs inside the server without ac power to the server, complete the following steps.

Note: After ac power has been removed from the server, power remains available to the LEDs for up to 12 hours, after which time you must turn on the server to supply power to the LEDs.

- 1) Read Appendix B, “Safety information,” on page 129 and “Installation guidelines” on page 15.
- 2) Turn off the server and all attached peripheral devices.
- 3) Disconnect all power cords and external cables from the back of the server.
- 4) Remove the server cover (see “Removing the cover” on page 18).

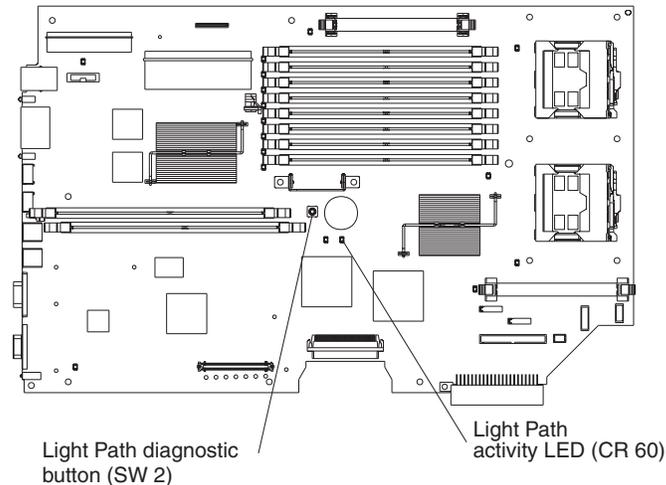


Figure 63. Lighting the light path LEDs without ac power

- 5) Press and hold the blue light path diagnostic button (see Figure 63) to illuminate the system board LEDs.

Important: You can press this button for no longer than two minutes to light the LEDs. After this time, the power to the LEDs is exhausted.

Note: If no LEDs are lit when you press the light path diagnostic button, check the light path activity LED; if the light path activity LED lights while you are pressing the light path diagnostic button, this indicates that the light path is working properly and that there are no LEDs lit with this particular error.

- c. If the lit LED on the light path diagnostics panel does not refer to a specific internal component, continue with step 5.
5. Go to the table at “Light path diagnostics errors” on page 93 and find the entry for the associated lit LED; then, replace the indicated component or take the indicated action.

Notes:

- The system-error log and the BMC log might contain additional information that will be helpful before replacing a component.
- If an LED on the light path diagnostics panel is lit and the system-error LED is not lit, there is probably an LED problem. Run LED diagnostics (see “Starting the diagnostic programs” on page 71).

Remind button

When an error occurs that you are not able to correct immediately, use the remind button feature to acknowledge the error and remain informed of any additional errors that occur. The remind button is located on the light path diagnostics panel.

To activate this feature, press the remind button; this places the system-error LED on the operator information panel in remind mode. When placed in remind mode, the system-error LED will flash rapidly until one of the following occurs:

- When the problem is corrected, the system-error LED will no longer be lit.
- If an additional problem occurs, the system-error LED will again be lit continuously.
- If the server is restarted and the problem is not yet corrected, the system-error LED will again be lit continuously.

Reset button

Press the reset button to reset the server and run the power-on self-test (POST). The reset button is on the top of the operator panel, to the right of the remind button. The reset button is recessed, and you might have to use a pen or the end of a straightened paper clip to press the button.

Updating the BMC firmware

Use the baseboard management controller (BMC) firmware update utility program to download a BMC firmware update or a SDR/FRU update. The firmware update utility program updates the BMC firmware or SDR/FRU data only and does not affect any device drivers.

Go to <http://www.ibm.com/support/> to download the utility program; then, copy the Flash.exe file to a firmware update diskette.

Note: To ensure proper server operation, be sure to update the server BMC firmware code first before updating the BIOS code.

To update the firmware, use one of the following methods:

- If the Linux or Windows® operating-system update package is available from the World Wide Web and you have obtained the applicable update package, follow the instructions that come with the update package.
- If you are using a diskette, complete the following steps:
 1. Insert the firmware update diskette into the USB diskette drive and restart the server.
 2. Follow the instructions on the screen.

Recovering the BMC firmware

If the BMC code in the server becomes damaged, the server might have difficulty restarting (rebooting). If the server does not turn on and the heartbeat LED (CR 47; see Figure 59 on page 73) is not on, you will need to force a BMC update.

Complete the following steps to force a BMC update:

1. Read Appendix B, "Safety information," on page 129 and "Handling static-sensitive devices" on page 16.
2. Turn off the server and all attached devices.

3. Disconnect the power cord; then, disconnect all external cables.
4. Remove the cover (see “Removing the cover” on page 18).

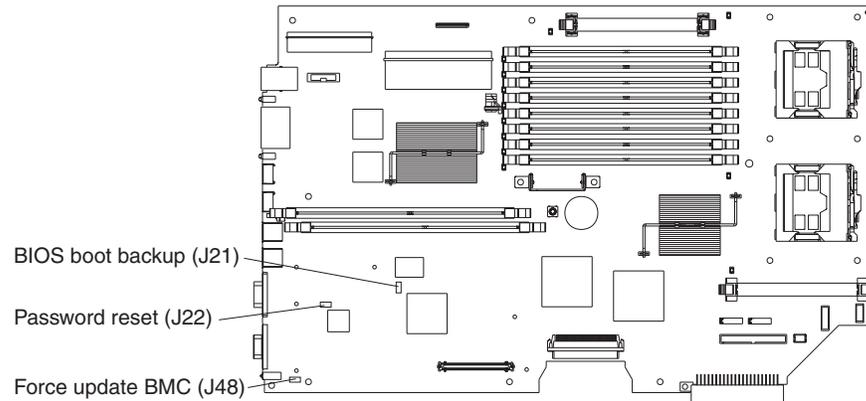


Figure 64. Force update BMC jumper location

5. Locate the force update BMC jumper block (J48) on the system board, removing any components that impede access to the jumper.
6. Place a jumper on jumper on the force update BMC jumper block.
7. Replace any components that were removed.
8. Replace the cover.
9. Connect the server to a power source, keyboard, monitor, and mouse.

You will now be able to start the server. When you start the server, you must update the BMC firmware code (see “Updating the BMC firmware” on page 76).

When the update is complete, repeat the previous procedure, removing the jumper on jumper block J48.

Recovering the BIOS code

If power to the server is interrupted while POST/BIOS code is being updated (flash update), the server might not restart (reboot) correctly or might not display video (no video). If this happens, you will need a BIOS recovery diskette.

To create this diskette, download the BIOS recovery disk image from <http://www.ibm.com/support> and follow the directions in the image’s included readme file.

Using the BIOS recovery diskette, complete the following steps to recover the BIOS code:

1. Read Appendix B, “Safety information,” on page 129 and “Handling static-sensitive devices” on page 16.
2. Turn off the server and all attached devices.
3. Disconnect the power cord; then, disconnect all external cables.
4. Remove the cover (see “Removing the cover” on page 18).
5. Locate the BIOS boot backup jumper (J21) on the system board, removing any components that impede access to the jumper.

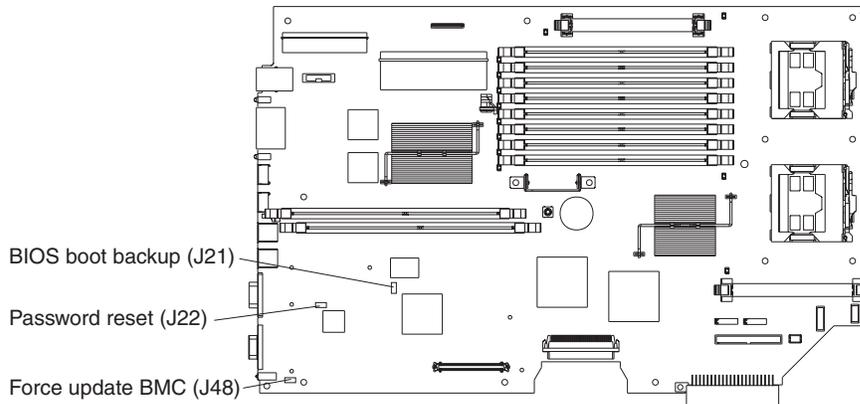


Figure 65. BIOS boot backup jumper location

6. Remove the BIOS boot backup jumper from pins 1 and 2, and place it on pins 2 and 3.
7. Replace any components that were removed.
8. Replace the cover.
9. Connect the server to a power source, keyboard, monitor, and mouse.
10. If the diskette drive contains a diskette, remove it.
11. Insert into the diskette drive the BIOS recovery diskette that you have created from <http://www.ibm.com/support/>.
12. Turn on the server and the monitor.
13. After the update session is completed, turn off the server and monitor.
14. Remove the diskette from the diskette drive.
15. Disconnect all power cords and external cables.
16. Remove the cover.
17. Remove any components that impede access to the jumper block.
18. Remove the BIOS boot backup jumper from pins 2 and 3, and place it on pins 1 and 2.
19. Replace any components that were removed.
20. Reinstall the cover.
21. Reconnect all external cables and power cords and turn on the peripheral devices.
22. Turn on the server to restart the operating system.

Erasing a lost or forgotten password (clearing CMOS memory)

This section applies to a lost or forgotten power-on password. For general information about passwords, see the *User's Guide* on the IBM *Documentation CD*.

Attention: If an administrator password is lost or forgotten, there is no way to change, override, or remove it. You must replace the system board.

To set the power-on password reset jumper and erase a forgotten password, complete the following steps:

1. Read Appendix B, "Safety information," on page 129 and "Handling static-sensitive devices" on page 16.
2. Turn off the server and all attached devices.

3. Disconnect the power cord, and disconnect all external cables.
4. Remove the cover (see “Removing the cover” on page 18).
5. Locate the password reset jumper (J22) on the system board, removing any components that impede access to the jumper.

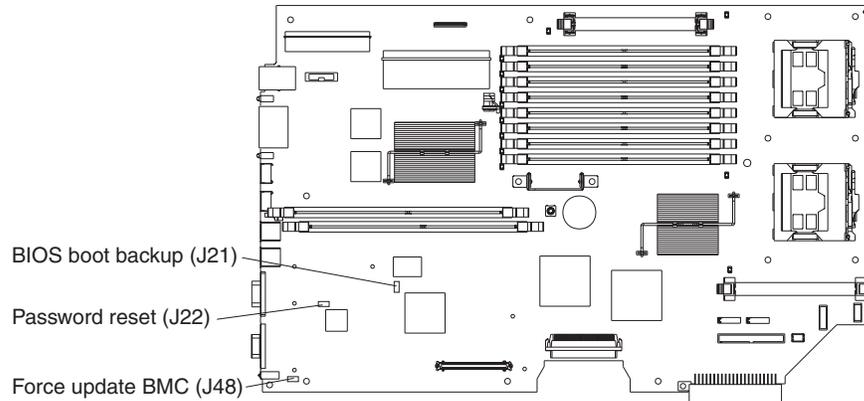


Figure 66. Password reset jumper location

6. Remove the password reset jumper from pins 1 and 2, and place it on pins 2 and 3.
7. Replace any components that were removed.
8. Replace the cover.

You will be able to start the server one time, without having to use the power-on password, and start the Configuration/Setup Utility program. You can either delete the old password or set a new power-on password. If you do not change or delete the password, the next time you start the server the original power-on password will be reinstated.

9. Connect the server to a power source, keyboard, monitor, and mouse.
10. Turn on the server. The Configuration/Setup Utility program starts.
11. Follow the instructions to erase the existing password or create a new password.
12. Select **Save Settings** and press Enter.

When the password reset is completed, it is not necessary to return the jumper to pins 1 and 2.

Updating Remote Supervisor Adapter II SlimLine firmware

Information about updating the firmware of the Remote Supervisor Adapter II SlimLine can be found in the *Remote Supervisor Adapter II User's Guide*.

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 119).
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 page 119).

Troubleshooting the Ethernet controller

This section provides troubleshooting information for problems that might occur with the 10/100/1000 Mbps Ethernet controller.

Network connection problems

If the Ethernet controller cannot connect to the network, check the following conditions:

- Make sure that the 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 either 100 Mbps or 1000 Mbps, you must use Category 5 or higher cabling.

- 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 rear of the server.

These LEDs indicate whether there is a problem with the connector, cable, or hub:

- The Ethernet transmit/receive activity LED, on the rear of the server, is lit when the Ethernet controller sends or receives data over the Ethernet Network. If the Ethernet transmit/receive activity LED is off, make sure that the hub and network are operating and that the correct device drivers are installed.
- The Ethernet link status LED, on the rear of the server, 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.
- Make sure that you are using the correct device drivers, which are supplied 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.
- Test the Ethernet controller.

The way the Ethernet controller is tested depends on which operating system you are using (see the Ethernet controller device driver readme files).

Ethernet controller troubleshooting chart

Use the following troubleshooting chart to find solutions to 10/100/1000 Mbps Ethernet controller problems that have definite symptoms.

Description	FRU/action
The server stops running when loading device drivers.	<p>The PCI BIOS interrupt settings are incorrect.</p> <ul style="list-style-type: none"> • Determine whether the interrupt (IRQ) setting that is assigned to the Ethernet controller is also assigned to another device in the Configuration/Setup Utility program. <p>Although interrupt sharing is allowed for PCI devices, some devices do not function well when they share an interrupt with a dissimilar PCI device. Try changing the IRQ assigned to the Ethernet controller or the other device. For example, for NetWare Versions 3 and 4, it is recommended that disk controllers not share interrupts with LAN controllers.</p> <ul style="list-style-type: none"> • Make sure that you are using the most recent device driver that is available from the World Wide Web. • Reseat or replace the adapter.
The Ethernet link status LED does not work.	<ul style="list-style-type: none"> • Make sure that the hub is turned on. • Check all connections at the Ethernet controller and the hub. • Use another port on the hub. • If the hub does not support auto-negotiation, manually configure the Ethernet controller to match the hub. • If you manually configured the Duplex mode, make sure that you also manually configure the speed. • Reseat or replace the adapter.
The Ethernet transmit/receive activity LED does not work.	<ul style="list-style-type: none"> • Make sure that you have installed the network device drivers. • The network might be idle. Try sending data from this server.
Data is incorrect or sporadic.	<ul style="list-style-type: none"> • Make sure that you are using Category 5 or higher cabling when operating the server at 100 Mbps or at 1000 Mbps. • Make sure that the cables do not run close to noise-inducing sources like fluorescent lights.
The Ethernet controller stopped working when another adapter was added to the server.	<ul style="list-style-type: none"> • Make sure that the cable is connected to the Ethernet controller. • Make sure that the PCI system BIOS code is current. • Reseat the adapter. • Determine whether the interrupt (IRQ) setting that is assigned to the Ethernet adapter is also assigned to another device in the system. Use the Configuration/Setup Utility program to determine whether this is the case. <p>Although interrupt sharing is allowed for PCI devices, some devices do not function well when they share an interrupt with a dissimilar PCI device. Try changing the IRQ that is assigned to the Ethernet adapter or the other device.</p> <ul style="list-style-type: none"> • Reseat or replace the adapter.
The Ethernet controller stopped working without apparent cause.	<ul style="list-style-type: none"> • Try a different connector on the hub. • Reinstall the device drivers. See the operating-system documentation and the ServerGuide information. • Reseat or replace the adapter.

Ethernet controller messages

The integrated Ethernet controller might display messages from certain device drivers. The latest available information concerning these messages is at the IBM Support Web site at <http://www.ibm.com/support/>.

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This index supports xSeries 336 servers.

Notes:

1. Check the configuration before you replace a CRU or FRU. Configuration problems can cause false errors and symptoms.
2. For IBM devices not supported by this index, see the documentation for that device.
3. Always start with “General checkout” on page 67.

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 server.

The first column of the two-column tables in this index lists error codes or messages, and the last column lists one or more suggested actions or FRUs to

replace. Take the action (or replace the FRU) that is suggested first in the list, and then try the server again to see whether the problem has been corrected.

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

The POST BIOS code displays POST error codes and messages on the screen.

Beep symptoms

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

Beeps	Description
1-2-3	<ul style="list-style-type: none"> • 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 the system is functioning properly.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.	
Beep/symptom	FRU/action
1-1-2 (Microprocessor register test failed)	<ol style="list-style-type: none"> 1. Optional microprocessor (if installed) 2. Microprocessor 3. System board
1-1-3 (CMOS write/read test failed)	<ol style="list-style-type: none"> 1. Battery 2. Clear CMOS. See “Erasing a lost or forgotten password (clearing CMOS memory)” on page 78. 3. System board
1-1-4 (BIOS EEPROM checksum failed)	<ol style="list-style-type: none"> 1. DIMM 2. System board
1-2-1 (Programmable Interval Timer failed)	<ul style="list-style-type: none"> • System board
1-2-2 (DMA initialization failed)	<ul style="list-style-type: none"> • System board
1-2-3 (DMA page register write/read failed)	<ul style="list-style-type: none"> • System board
1-2-4 (RAM refresh verification failed)	<ol style="list-style-type: none"> 1. DIMM 2. System board

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Beep/symptom	FRU/action
1-3-1 (first 64K RAM test failed)	<ol style="list-style-type: none"> Reseat the DIMM Replace the lowest-numbered pair of DIMMs with an identical known good pair of DIMMs; then, restart the server. If the beep code error remains, go to 3. Return one DIMM at a time from the failed pair to its connector, restarting the server after each DIMM, to identify the failed DIMM. System board
1-3-2 (first 64K RAM parity test failed)	<ol style="list-style-type: none"> DIMM System board
2-1-1 (Secondary DMA register failed)	<ul style="list-style-type: none"> System board
2-1-2 (Primary DMA register failed)	<ul style="list-style-type: none"> System board
2-1-3 (Primary interrupt mask register failed)	<ul style="list-style-type: none"> System board
2-1-4 (Secondary interrupt mask register failed)	<ul style="list-style-type: none"> System board
2-2-1 (Interrupt vector loading failed)	<ul style="list-style-type: none"> System board
2-2-2 (Keyboard controller failed)	<ol style="list-style-type: none"> Keyboard System board
2-2-3 (CMOS power failure and checksum checks failed)	<ol style="list-style-type: none"> Battery Clear CMOS. See “Erasing a lost or forgotten password (clearing CMOS memory)” on page 78. System board
2-2-4 (CMOS configuration information validation failed)	<ol style="list-style-type: none"> Battery Clear CMOS. See “Erasing a lost or forgotten password (clearing CMOS memory)” on page 78. System board
2-3-1 (Screen initialization failed)	<ul style="list-style-type: none"> System board
2-3-2 (Screen memory failed)	<ul style="list-style-type: none"> System board
2-3-3 (Screen retrace failed)	<ul style="list-style-type: none"> System board
2-3-4 (Search for video ROM failed)	<ul style="list-style-type: none"> System board
2-4-1 (Video failed; system believed operable)	<ul style="list-style-type: none"> System board

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Beep/symptom	FRU/action
2-4-4 (Invalid memory configuration)	<ol style="list-style-type: none"> 1. Make sure that DIMMs are installed in the correct configuration (see “Memory module considerations” on page 32). 2. Failing DIMM. 3. System board.
3-1-1 (Timer tick interrupt failed)	<ul style="list-style-type: none"> • System board
3-1-2 (Interval timer channel 2 failed)	<ul style="list-style-type: none"> • System board
3-1-3 (RAM test failed above address OFFFHH)	<ol style="list-style-type: none"> 1. DIMM 2. System board
3-1-4 (Time-Of-Day clock failed)	<ol style="list-style-type: none"> 1. Battery 2. System board
3-2-1 (Serial port failed)	<ul style="list-style-type: none"> • System board
3-2-2 (Parallel port failed)	<ul style="list-style-type: none"> • System board
3-2-3 (Math coprocessor test failed)	<ol style="list-style-type: none"> 1. Microprocessor 2. System board
3-2-4 (Failure comparing CMOS memory size against actual)	<ol style="list-style-type: none"> 1. DIMM 2. System board 3. Battery
3-3-1 (Memory size mismatch occurred.)	<ol style="list-style-type: none"> 1. DIMM 2. System board 3. Battery
3-3-2 (Critical SMBUS error occurred)	<ol style="list-style-type: none"> 1. Disconnect the server power cord from outlet, wait 30 seconds and retry. 2. Remote Supervisor Adapter II SlimLine. 3. System board.
3-3-3 (No operational memory in system) Note: 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 is set to Enabled (its default setting), you must restart the server three times to force the system BIOS code to reset the memory connector or bank of connectors from Disabled to Enabled .	<ol style="list-style-type: none"> 1. Install or reseat the memory modules, and then do a 3 boot reset. 2. DIMMs. 3. System board.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.	
Beep/symptom	FRU/action
4-4-4 (Optional system management adapter not installed in slot 1 or not functioning correctly)	<ol style="list-style-type: none"> 1. Verify that the adapter is installed in slot 1. 2. Adapter. 3. System board.
Two short beeps (Information only, the configuration has changed)	<ol style="list-style-type: none"> 1. Run Diagnostics. 2. Run the Configuration/Setup Utility program.
Three short beeps	<ol style="list-style-type: none"> 1. Reseat the DIMMs 2. Locate the failing DIMMs: <ol style="list-style-type: none"> a. Remove all DIMMs from the server. b. Beginning with the primary bank of DIMMs, return one bank of DIMMs to the server at a time, restarting the server each time, until the beep code error returns. c. Replace one pair of DIMMs at a time in the failing bank with an identical pair of known good DIMMs, restarting the server after each pair, until the beep code error returns. d. Replace one DIMM at a time in the failing pair with an identical known good DIMM, restarting the server after each DIMM, to identify the failed DIMM. If the beep code error remains after you have replaced both DIMMs, go to step 3. e. Repeat steps 2b through 2d until you have checked all memory banks. 3. System board
One continuous beep	<ol style="list-style-type: none"> 1. Reseat the following components, one at a time, in the order shown, restarting the server each time: <ul style="list-style-type: none"> • (Trained service technician only) Microprocessor 1 • (Trained service technician only) Microprocessor 2 (if installed) 2. (Trained service technician only) Remove microprocessor 2 and its VRM and restart the server. <ul style="list-style-type: none"> • If no beep code occurs, microprocessor 2 might have failed; replace the microprocessor. • If the beep code remains, remove microprocessor 1 and install microprocessor 2 in the connector for microprocessor 1; then, restart the server. If no beep code occurs, microprocessor 1 might have failed; replace the microprocessor. 3. Microprocessor 4. Optional microprocessor (if installed) 5. System board
Repeating short beeps	<ol style="list-style-type: none"> 1. Keyboard 2. System board

No-beep symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.	
No-beep symptom	FRU/action
No beep and the system operates correctly.	<ol style="list-style-type: none"> 1. System board

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.	
No-beep symptom	FRU/action
No beep and no video (System error LED is OFF)	• See “ Undetermined problems ” on page 119.
No beep and no video (System attention LED is ON)	• See “ Light path diagnostics errors ” on page 93.

POST error codes

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

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/action
062 (Three consecutive startup failures using the default configuration.)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. System board. 4. Microprocessor.
101, 102, 106 (System and processor error)	• System board
111 (Channel check error)	<ol style="list-style-type: none"> 1. Failing adapter 2. DIMM 3. System board
114 (Adapter read-only memory error)	<ol style="list-style-type: none"> 1. Run diagnostics. 2. Failing adapter.
129 (Internal cache error)	<ol style="list-style-type: none"> 1. Microprocessor 2. Optional microprocessor (if installed) 3. System board
151 (Real time clock error)	<ol style="list-style-type: none"> 1. Battery 2. Clear CMOS. See “Erasing a lost or forgotten password (clearing CMOS memory)” on page 78. 3. System board
161 (Real time clock battery error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. Clear CMOS. See “Erasing a lost or forgotten password (clearing CMOS memory)” on page 78. 4. System board.
162 (Device configuration error) Note: Be sure to load default settings and any additional desired settings; then, <i>save the configuration.</i>	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. Failing device. 4. System board.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
163 (Real-time clock error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. Clear CMOS. See “Erasing a lost or forgotten password (clearing CMOS memory)” on page 78. 4. System board.
164 (Memory configuration changed.)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. DIMM. 3. System board.
165 (Service Processor failure)	<ul style="list-style-type: none"> • System board
175 (Hardware error)	<ul style="list-style-type: none"> • System board
177, 178 (Security hardware error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. System board.
184 (Power-on password damaged)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Clear CMOS. See “Erasing a lost or forgotten password (clearing CMOS memory)” on page 78. 3. System board.
185 (Drive startup sequence information damaged)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. System board.
186 (Security hardware control logic failed)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. System board.
187 (VPD serial number not set.)	<ol style="list-style-type: none"> 1. Set serial number in the Configuration/Setup Utility program. 2. System board.
188 (Bad EEPROM CRC #2)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. System board.
189 (Three attempts were made to access the server with invalid passwords)	<ul style="list-style-type: none"> • Run the Configuration/Setup Utility program, and enter the administrator password.
196 (Microprocessor mismatch error)	<ol style="list-style-type: none"> 1. Move microprocessor in socket 1 to socket 2, and move microprocessor in socket 2 to socket 1. 2. Microprocessor.
201 (Memory test error) Note: If the server does not have the latest level of BIOS code installed, update the BIOS code to the latest level and run the diagnostic program again.	<ol style="list-style-type: none"> 1. DIMM 2. System board
229 (Internal cache error)	<ol style="list-style-type: none"> 1. Microprocessor 2. Optional microprocessor (if installed)

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
262 (DRAM parity configuration error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. System board.
289 (DIMM disabled by system or user)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program, if the DIMM was disabled by the user. 2. Disabled DIMM, if not disabled by user. 3. System board
301 (Keyboard or keyboard controller error)	<ol style="list-style-type: none"> 1. Keyboard 2. System board
303 (Keyboard controller error)	<ul style="list-style-type: none"> • System board
602 (Invalid diskette boot record)	<ol style="list-style-type: none"> 1. Diskette 2. Diskette drive 3. Cable 4. System board
604 (Diskette drive error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and diagnostics. 2. Diskette drive. 3. Drive cable. 4. System board.
605 (Unlock failure)	<ol style="list-style-type: none"> 1. Diskette drive 2. Drive cable 3. System board
662 (Diskette drive configuration error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and diagnostics. 2. Diskette drive. 3. Drive cable. 4. System board.
762 (Coprocessor configuration error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. Microprocessor.
962 (Parallel port error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. System board.
11XX (System board serial port 1 or 2 error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. System board.
1600 (The system management processor is not functioning) Before replacing a FRU, remove the ac power to the server, wait 20 seconds; then, reconnect the ac power. Wait 30 seconds; then, turn on the server.	System board

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<p>1601 (The system is able to communicate to the system management processor, but the system management processor failed to respond at the start of POST.) Complete the following steps before replacing a FRU:</p> <ol style="list-style-type: none"> 1. Remove the ac power to the server, wait 20 seconds; then, reconnect the ac power. Wait 30 seconds; then, turn on the server. 2. Flash update the system management processor. 	<ol style="list-style-type: none"> 1. Remote Supervisor Adapter, if installed 2. System board
<p>1602 (Optional service processor not properly installed.)</p>	<p>Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry.</p>
<p>1762 (Hard disk configuration error (IDE only))</p>	<ol style="list-style-type: none"> 1. Hard disk drive. 2. Hard disk drive cables. 3. Run the Configuration/Setup Utility program. 4. SCSI backplane. 5. System board.
<p>178X (Hard disk drive error (IDE only))</p>	<ol style="list-style-type: none"> 1. Hard disk drive cables. 2. Run diagnostics. 3. Hard disk drive. 4. System board.
<p>1800 (No more hardware interrupt available for PCI adapter)</p>	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Failing adapter. 3. System board.
<p>1801 (No more ROM space available for PCI adapter)</p>	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Failing adapter. 3. System board.
<p>1962 (Drive does not contain a valid boot sector)</p>	<ol style="list-style-type: none"> 1. Verify that a startable operating system is installed. 2. Run drive diagnostics. 3. Hard disk drive. 4. SCSI backplane. 5. Cable. 6. System board.
<p>2400 (Video controller test failure)</p>	<ol style="list-style-type: none"> 1. Video adapter (if installed) 2. System board
<p>2462 (Video memory configuration error)</p>	<ol style="list-style-type: none"> 1. Video adapter (if installed) 2. System board

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
5962 (IDE CD-ROM drive configuration error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. CD-ROM drive. 3. CD-ROM power cable. 4. IDE cable. 5. System board. 6. Battery.
8603 (Pointing-device error)	<ol style="list-style-type: none"> 1. Pointing device 2. System board
00012000 (Machine check architecture error)	<ol style="list-style-type: none"> 1. Microprocessor 1 2. Optional microprocessor 2 3. System board
00019501 (Microprocessor 1 is not functioning – check VRM and microprocessor LEDs)	<ol style="list-style-type: none"> 1. Microprocessor 1 2. System board
00019502 (Microprocessor 2 is not functioning – check VRM and microprocessor LEDs)	<ol style="list-style-type: none"> 1. Microprocessor 2 2. System board
00019701 (Microprocessor 1 failed BIST)	<ol style="list-style-type: none"> 1. Microprocessor 1 2. System board
00019702 (Microprocessor 2 failed BIST)	<ol style="list-style-type: none"> 1. Microprocessor 2 2. System board
00180100 (No room for PCI option ROM)	<ol style="list-style-type: none"> 1. Reorder the adapters in the PCI slots. It is important that the startup device is positioned early in the startup-device order so that it is run by POST. 2. Run the Configuration/Setup Utility program Utility program to make sure that the PCI adapter and all other adapters are set correctly; change any incorrect memory resource settings. 3. Failing adapter. 4. System board.
00180200 (No more I/O space available for PCI adapter)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Failing adapter. 3. System board.
00180300 (No more memory (above 1MB for PCI adapter))	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Failing adapter. 3. System board.
00180400 (No more memory (below 1MB for PCI adapter))	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Move the failing adapter to slot 1 or 2. 3. Failing adapter. 4. System board.
00180500 (PCI option ROM checksum error)	<ol style="list-style-type: none"> 1. Failing PCI adapter. 2. System board.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
00180600 (PCI device BIST failure)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Move the failing adapter to slot 1 or 2. 3. Failing adapter. 4. System board
00180700 (PCI device not responding (only if enabled in BIOS))	<ol style="list-style-type: none"> 1. System board 2. PCI adapter
00180800 (Unsupported PCI device installed)	<ol style="list-style-type: none"> 1. PCI adapter 2. System board
01298001 (No update data for microprocessor 1)	<ol style="list-style-type: none"> 1. Make sure that all microprocessors are of the same type, and that they have the same cache size and clock speed. 2. Microprocessor 1.
01298002 (No update data for microprocessor 2)	<ol style="list-style-type: none"> 1. Make sure that all microprocessors are of the same type, and that they have the same cache size and clock speed. 2. Microprocessor 2.
01298101 (Bad update data for microprocessor 1)	<ol style="list-style-type: none"> 1. Make sure that all microprocessors are of the same type, and that they have the same cache size and clock speed. 2. Microprocessor 1.
01298102 (Bad update data for microprocessor 2)	<ol style="list-style-type: none"> 1. Make sure that all microprocessors are of the same type, and that they have the same cache size and clock speed. 2. Microprocessor 2.
I9990301 (Hard disk sector error)	<ol style="list-style-type: none"> 1. Hard disk drive 2. Cable 3. SCSI backplane 4. System board
I9990305 (Hard disk sector error, no operating system installed)	<ol style="list-style-type: none"> 1. Install operating system to hard disk.
I9990650 (AC power has been restored)	<ol style="list-style-type: none"> 1. Check ac cable. 2. Check for interruption of power. 3. Power cable.

Light path diagnostics errors

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Diagnostics panel LED	FRU/action
None (undiagnosed error or service processor has failed)	<ul style="list-style-type: none"> • Check system-error log and BMC log for information about the error.
OVER SPEC (power supplies using more power than maximum rating allows)	<ol style="list-style-type: none"> 1. Remove optional devices from the server. 2. Replace failing power supply.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Diagnostics panel LED	FRU/action
PS1 (power supply 1: lit=failure or removal; flashing=invalid power supply configuration)	<ol style="list-style-type: none"> 1. Make sure power supply 1 is installed correctly. 2. Power supply 1. 3. Power backplane.
PS2 (power supply 2: lit=failure or removal; flashing=invalid power supply configuration)	<ol style="list-style-type: none"> 1. Make sure power supply 2 is installed correctly. 2. Power supply 2. 3. Power backplane.
CPU (microprocessor: lit=failure (LED next to the failing microprocessor is on); flashing=invalid microprocessor configuration)	<ol style="list-style-type: none"> 1. Make sure microprocessors are compatible (see “Microprocessor considerations” on page 36). 2. Failing microprocessor. 3. System board.
VRM (VRM: lit=failure (LED next to the failing (second) VRM might be on); flashing=invalid VRM configuration)	<ol style="list-style-type: none"> 1. Make sure VRMs are installed correctly. 2. Failing VRM. 3. System board.
CNFG (flashes to indicate invalid configuration exists; error LED next to failing component might also be flashing)	<ol style="list-style-type: none"> 1. Make sure that DIMMs, microprocessors, and VRMs are installed correctly and are of the correct type (see “Memory module considerations” on page 32 and “Microprocessor considerations” on page 36). 2. Run the Configuration/Setup Utility program and make sure DIMMs, microprocessors, and VRMs are configured correctly. 3. Failing component (check system-error log and BMC log).
MEM (memory: lit=failure (LED next to failing DIMM is on); flashing=invalid DIMM configuration failure))	<ol style="list-style-type: none"> 1. Make sure DIMMs are installed correctly. 2. Failing DIMM. 3. System board.
NMI (non-maskable interrupt occurred)	<ol style="list-style-type: none"> 1. Make sure that the operating system is installed correctly and that any service pack updates have been installed. 2. Make sure that all device drivers, firmware, and BIOS code are at the current level. 3. System board.
S ERR (a soft error has occurred)	<ol style="list-style-type: none"> 1. Make sure that the operating system is installed correctly and that any service pack updates have been installed. 2. Make sure that all device drivers, firmware, and BIOS code are at the current level. 3. System board.
SP (service processor failure)	<ol style="list-style-type: none"> 1. Shut down server and disconnect power cords for 30 seconds; then, reconnect power cords and restart server. 2. System board.
DASD (hard disk drive failure (the drive LED, if supported, near the failing drive is lit))	<ol style="list-style-type: none"> 1. Be sure the fans are operating correctly and the airflow is good so that the drive is not overheating. 2. Hard disk drive. 3. SCSI backplane.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Diagnostics panel LED	FRU/action
<p>FAN (fan: lit=failure or slow fan operation (LED at failing fan is on); flashing=invalid fan configuration)) Note: The TEMP LED might also be lit.</p>	<ol style="list-style-type: none"> 1. Make sure fans are installed correctly. 2. Failing fan. 3. Fan backplanes. 4. System board.
<p>TEMP (temperature exceeded a threshold level) Note: The FAN LED might also be lit.</p>	<ol style="list-style-type: none"> 1. Ambient temperature must be within normal operating specifications; see “Features and specifications” on page 3. 2. Make sure that all fans are operating correctly and the airflow is not blocked. 3. System board.
<p>BRD (battery fault or system board error)</p>	<ol style="list-style-type: none"> 1. Check error LEDs on system board to identify faulty component. 2. Check system-error log and BMC log. 3. Replace battery. 4. System board.
<p>PCI A (error has occurred on PCI bus A)</p>	<ol style="list-style-type: none"> 1. PCI-Express adapter in slot 2. 2. System board.
<p>PCI B (error has occurred on PCI bus B)</p>	<ol style="list-style-type: none"> 1. PCI/PCI-X adapter in slots 1 or 2 2. SCSI backplane 3. System board
<p>PCI C (error has occurred on PCI bus C)</p>	<ol style="list-style-type: none"> 1. Verify that the Ethernet controllers are working correctly. 2. Check system-error log and BMC log. 3. System board.

Hot-swap power-supply LED errors

Use the information in this section to solve power-supply problems.

Note: The minimum configuration required for the dc good light to be lit is:

- Power supply
- Power cage assembly, if installed.
- System board (use jumper J40 to bypass the power switch; see “System-board jumpers” on page 62).

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

AC good LED	DC good LED	Description	FRU/action
Off	Off	No power to system or ac problem.	<ol style="list-style-type: none"> 1. Check ac power to the system. 2. Power supply.
On	Off	Standby mode or dc problem.	<ol style="list-style-type: none"> 1. Make sure power backplane is installed correctly. 2. Bypass power control button by placing a jumper momentarily on jumper block J40 (see “System-board jumpers” on page 62). Note: Do not allow the jumper to remain on jumper block J40 for more than three seconds. If the dc good LED is lit, press Ctrl+Alt+Delete. Watch the screen for any POST errors. Check the system error log for any listed problems. If the system starts with no errors: <ol style="list-style-type: none"> a. Power switch assembly b. System board 3. Remove the adapters and disconnect the cables and power connectors to all internal and external devices. Turn on the system. If the dc good LED is lit, replace the adapters and devices one at a time until you isolate the problem. 4. Power backplane. 5. Power cage assembly, if installed. 6. System board.
On	On	Power is working properly.	N/A

Diagnostic error codes

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

- 000** The test passed.
- 195** The Esc key was pressed to stop the test.
- 197** Warning; a hardware failure might not have occurred.

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

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/action
001-250-000 (Failed processor board ECC)	<ul style="list-style-type: none"> • Microprocessor board
001-XXX-000 (Failed core tests)	<ul style="list-style-type: none"> • System board
001-XXX-001 (Failed core tests)	<ul style="list-style-type: none"> • System board
001-292-000 (Failed processor board ECC)	<ul style="list-style-type: none"> • Load BIOS code defaults and rerun test.
005-XXX-000 (Failed video test)	<ol style="list-style-type: none"> 1. Video adapter (if installed) 2. System board
011-XXX-000 (Failed COM1 serial port test)	<ul style="list-style-type: none"> • Check loopback plug connected to externalized serial port. • Check cable from externalized port to system board.
011-XXX-001 (Failed COM2 serial port test)	<ul style="list-style-type: none"> • Check loopback plug connected to externalized serial port. • Check cable from externalized port to system board.
014-XXX-000 (Failed parallel port test)	<ul style="list-style-type: none"> • System board
015-XXX-001 (USB interface not found, board damaged)	<ol style="list-style-type: none"> 1. System board
015-XXX-015 (Failed USB external loopback test)	<ol style="list-style-type: none"> 1. Make sure the parallel port is not disabled. 2. Run the USB external loopback test again. 3. System board.
015-XXX-198 (Remote Supervisor Adapter II SlimLine installed) <i>or</i> (USB device connected during USB test)	<ol style="list-style-type: none"> 1. If Remote Supervisor Adapter II SlimLine is installed as an option, remove it and rerun test. Note: If Remote Supervisor Adapter II SlimLine is present as a standard installation, do not remove it; the test cannot be run. 2. Remove USB devices and rerun test. 3. System board.
020-XXX-000 (Failed PCI interface test)	<ul style="list-style-type: none"> • System board
020-XXX-001 (Failed hot-swap slot 1 PCI latch test)	<ol style="list-style-type: none"> 1. PCI hot-swap latch assembly 2. System board
020-XXX-002 (Failed Hot-swap slot 2 PCI latch test)	<ol style="list-style-type: none"> 1. PCI hot-swap latch assembly 2. System board

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
020-XXX-003 (Failed hot-swap slot 3 PCI latch test)	<ol style="list-style-type: none"> PCI hot-swap latch assembly System board
020-XXX-004 (Failed hot-swap slot 4 PCI latch test)	<ol style="list-style-type: none"> PCI hot-swap latch assembly System board
030-XXX-000 (Failed internal SCSI interface test)	<ul style="list-style-type: none"> System board
035-XXX-099	<ol style="list-style-type: none"> No adapters were found. If adapter is installed re-check connection.
035-XXX-s99 (Failed RAID test on PCI slot s. s = number of failing PCI slot. Check System Error Log before replacing a FRU.)	<ol style="list-style-type: none"> RAID adapter SCSI backplane Cable
035-XXX-snn (Check test log before replacing a FRU. s = number of failing PCI slot, nn = SCSI ID of failing fixed disk.)	<ul style="list-style-type: none"> Hard disk drive with SCSI ID nn on RAID adapter in PCI slot s.
035-253-s99 (RAID adapter initialization failure)	<ol style="list-style-type: none"> ServeRAID adapter in slot s is not configured properly. Obtain the basic and extended configuration status and see the <i>ServeRAID Hardware Maintenance Manual</i> for more information. Cable. SCSI backplane. Adapter.
075-XXX-000 (Failed power supply test)	<ul style="list-style-type: none"> Power supply
089-XXX-001 (Failed microprocessor test)	<ol style="list-style-type: none"> Microprocessor 1 System board
089-XXX-002 (Failed optional microprocessor test)	<ol style="list-style-type: none"> Optional microprocessor 2 System board
165-060-000 (Service Processor: ASM may be busy)	<ol style="list-style-type: none"> Rerun the diagnostic test. Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. System board.
165-198-000 (Service Processor: Aborted)	<ol style="list-style-type: none"> Rerun the diagnostic test Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. System board.
165-201-000 (Service Processor: Failed)	<ol style="list-style-type: none"> Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. System board.
165-330-000 (Service Processor: Failed)	<ol style="list-style-type: none"> Update to the latest ROM diagnostic level and retry.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
165-342-000 (Service Processor: Failed)	<ol style="list-style-type: none"> 1. Ensure latest firmware levels for ASM and BIOS are installed. 2. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 3. System board.
166-051-000 System Management: Failed (Unable to communicate with RSA. It may be busy. Run the test again.)	<ol style="list-style-type: none"> 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 II SlimLine system-error log and BMC log) and retry. 4. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 5. Remote Supervisor Adapter II SlimLine.
166-060-000 System Management: Failed (Unable to communicate with RSA. It may be busy. Run the test again.)	<ol style="list-style-type: none"> 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 II SlimLine system-error log and BMC log) and retry. 4. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 5. Remote Supervisor Adapter II SlimLine.
166-070-000 System Management: Failed (Unable to communicate with RSA. It may be busy. Run the test again.)	<ol style="list-style-type: none"> 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 II SlimLine system-error log and BMC log) and retry. 4. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 5. Remote Supervisor Adapter II SlimLine.
166-198-000 System Management: Aborted (Unable to communicate with RSA. It may be busy. Run the test again.)	<ol style="list-style-type: none"> 1. Run the diagnostic test again. 2. Correct other error conditions and retry. These include other failed system management tests and items logged in the system-error Log of the optional Remote Supervisor Adapter II SlimLine. 3. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry. 4. Remote Supervisor Adapter II SlimLine, if installed. 5. System board.
166-201-001 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> 1. If installed, reseat the Remote Supervisor II SlimLine. 2. DIMMs. 3. System board.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
166-201-002 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> 1. Reseat I2C cable between the operator information card and the system board (“System-board internal connectors” on page 61). 2. Operator information panel. 3. System board.
166-201-003 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> 1. Reseat power backplane. 2. Power supply. 3. System board.
166-201-004 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> 1. SCSI backplane 2. System board
166-201-005 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> 1. DIMMs 2. Microprocessors 3. System board
166-250-000 System Management: Failed (I2C cable is disconnected. Reconnect I2C cable between RSA and system board.)	<ol style="list-style-type: none"> 1. Reseat the Remote Supervisor Adapter II SlimLine. 2. Remote Supervisor Adapter II SlimLine. 3. System board.
166-260-000 System Management: Failed (Restart RSA Error. After restarting, RSA communication was lost. Unplug and cold boot to reset RSA.)	<ol style="list-style-type: none"> 1. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry. 2. Reseat the Remote Supervisor Adapter II SlimLine. 3. Remote Supervisor Adapter II SlimLine.
166-342-000 System Management: Failed (RSA adapter BIST indicate failed tests.)	<ol style="list-style-type: none"> 1. Ensure the latest firmware levels for Remote Supervisor Adapter II SlimLine and BIOS are installed. 2. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 3. Remote Supervisor Adapter II SlimLine.
166-400-000 System Management: Failed (BMC self test result failed tests: x where x = Flash, RAM, or ROM.)	<ol style="list-style-type: none"> 1. Reflash or update firmware for BMC. 2. System board.
166-404-001 System Management: Failed (BMC indicates failure in I2C bus test.)	<ol style="list-style-type: none"> 1. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry. 2. Reflash or update firmware for BMC. 3. Power backplane 4. System board.
166-406-001 System Management: Failed (BMC indicates failure in I2C bus test.)	<ol style="list-style-type: none"> 1. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry. 2. Reflash or update firmware for BMC. 3. SCSI cable. 4. SCSI backplane. 5. System board.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
166-407-001 System Management: Failed (BMC indicates failure in I2C bus test.)	<ol style="list-style-type: none"> 1. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry. 2. Reflash or update firmware for BMC. 3. Operator information panel cable. 4. Operator information panel. 5. System board.
166-NNN-001 System Management: Failed (BMC indicates failure in self test where NNN=300 to 320.)	<ol style="list-style-type: none"> 1. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry. 2. Reflash or update firmware for BMC. 3. System board.
166-NNN-001 System Management: Failed (BMC indicates failure in I2C bus test where NNN=400 to 420 (excluding 412, 414, and 415).)	<ol style="list-style-type: none"> 1. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry. 2. Reflash or update firmware for BMC. 3. System board.
180-197-000 (SCSI ASPI driver not installed)	<ol style="list-style-type: none"> 1. Remove RAID adapter, if installed, and rerun test. 2. System board
180-361-003 (Failed fan LED test)	<ol style="list-style-type: none"> 1. Fan backplane 2. Cable (if present) from fan backplane to system board 3. System board
180-XXX-000 (Diagnostics LED failure)	<ul style="list-style-type: none"> • Run diagnostics panel LED test for the failing LED.
180-XXX-001 (Failed front LED panel test)	<ol style="list-style-type: none"> 1. Operator information card 2. System board
180-XXX-002 (Failed diagnostics LED panel test)	<ul style="list-style-type: none"> • System board
180-XXX-003 (Failed system board LED test)	<ul style="list-style-type: none"> • System board
180-XXX-005 (Failed SCSI backplane LED test)	<ol style="list-style-type: none"> 1. SCSI backplane 2. SCSI backplane cable 3. System board
201-XXX-0nn (Failed memory test.) Note: nn = slot number of failing DIMM; see Figure 54 on page 60.	<ol style="list-style-type: none"> 1. DIMM nn 2. System board
201-XXX-n99 (Multiple DIMM failure, see error text) Note: n = slot number of failing pair; see “Memory module considerations” on page 32.	<ol style="list-style-type: none"> 1. See error text for failing DIMMs. 2. Remove the lowest-numbered DIMM pair of those that are identified and replace it with an identical pair of known good DIMMs; then, restart the server. Repeat as necessary. If the failures continue after all identified pairs are replaced, go to step 4. 3. Return the removed DIMMs, one pair at a time, to their original connectors, restarting the server after each pair, until a pair fails. Replace each DIMM in the failed pair with an identical known good DIMM, restarting the server after each DIMM. Replace the failed DIMM. Repeat step 3 until you have tested all removed DIMMs. 4. System board.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
202-XXX-001 (Failed system cache test)	<ol style="list-style-type: none"> 1. Microprocessor 1 2. System board
202-XXX-002 (Failed system cache test)	<ol style="list-style-type: none"> 1. Microprocessor 2 2. System board
215-XXX-000 (Failed IDE CD-ROM drive test)	<ol style="list-style-type: none"> 1. Rerun the test with a different CD-ROM. 2. CD-ROM drive cables. 3. CD-ROM drive. 4. System board.
217-198-XXX (Could not establish drive parameters)	<ol style="list-style-type: none"> 1. Check cable and termination. 2. Hard disk drive backplane. 3. Hard disk drive.
217-XXX-000 (Failed hard disk drive test) Note: If RAID is configured, the hard disk drive number refers to the RAID logical array.	<ul style="list-style-type: none"> • Hard disk drive 1
217-XXX-001 (Failed hard disk test) Note: If RAID is configured, the hard disk number refers to the RAID logical array.	<ul style="list-style-type: none"> • Hard disk drive 2
217-XXX-002 (Failed hard disk test) Note: If RAID is configured, the hard disk number refers to the RAID logical array.	<ul style="list-style-type: none"> • Hard disk drive 3
217-XXX-003 (Failed hard disk test) Note: If RAID is configured, the hard disk number refers to the RAID logical array.	<ul style="list-style-type: none"> • Hard disk drive 4
264-XXX-0NN (Failed tape drive test)	<ol style="list-style-type: none"> 1. Tape cartridge, if user executed the Read/Write Tape Drive test (failure code of xxx = 256) 2. SCSI or power cable connected to tape drive with SCSI ID <i>nn</i> 3. Tape drive with SCSI ID <i>nn</i> (refer to the Help and Service Information appendix of the tape drive's User Guide) 4. System board or SCSI controller (run SCSI controller diagnostic to determine if the SCSI bus is functioning properly.)
264-XXX-999 (Errors on multiple tape drives, see error text for more info)	<ul style="list-style-type: none"> • See error messages/text in the PC Doctor error log for detailed information on each individual tape drive error.
301-XXX-000 (Failed keyboard test)	<ul style="list-style-type: none"> • Keyboard • System board.
405-XXX-000 (Failed Ethernet test on controller on the system board)	<ol style="list-style-type: none"> 1. Verify that Ethernet is not disabled in BIOS. 2. System board.
405-XXX-00n (Failed Ethernet test on adapter in PCI slot <i>n</i>)	<ol style="list-style-type: none"> 1. Adapter in PCI slot <i>n</i> 2. System board

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/action
405-XXX-a0n (Failed Ethernet test on adapter in PCI slot <i>a</i>)	<ol style="list-style-type: none"> For <i>a</i> = 0, system board For <i>a</i> > 0, adapter in PCI slot <i>a</i>
415-XXX-000 (Failed Modem test)	<ol style="list-style-type: none"> Cable Note: Ensure modem is present and attached to server. Modem System board

Error symptoms

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

Note: Some of the components in this section may not be supported on your server model.

If you cannot find the problem in the error symptom tables, run the diagnostic programs to test the server.

If you have just added new software or a new option and the server is not working, complete the following steps before using the error symptom charts:

- Remove the software or device that you just added.
- Run the diagnostic tests to determine whether the server is running correctly.
- Reinstall the new software or new device.

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

CD-ROM drive error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.	
Symptom	FRU/action
CD-ROM drive is not recognized.	<ol style="list-style-type: none"> Verify that: <ul style="list-style-type: none"> The IDE channel to which the CD-ROM drive is attached (primary or secondary) is enabled in the Configuration/Setup Utility program. All cables and jumpers are installed correctly. The signal cable and connector are not damaged and the connector pins are not bent. The correct device driver is installed for the CD-ROM drive. Run CD-ROM drive diagnostics. CD-ROM drive.
CD is not working properly.	<ol style="list-style-type: none"> Clean the CD. Run CD-ROM diagnostics. CD-ROM drive.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
CD-ROM drive tray is not working. (The server must be powered on.)	<ol style="list-style-type: none"> 1. Insert the end of a paper clip into the manual tray-release opening. 2. Run CD-ROM diagnostics. 3. Check the connector and signal cable for bent pins or damage. 4. CD-ROM drive.

Diskette drive error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
The diskette drive activity LED stays lit, or the server bypasses the diskette drive, or the diskette drive does not work.	<ol style="list-style-type: none"> 1. If there is a diskette in the drive, verify that: <ul style="list-style-type: none"> • 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, make sure that the distance between monitors and diskette drives is at least 76 mm (3 in.). 3. Run diskette drive diagnostics. 4. Cable. 5. Diskette drive. 6. System board.

General error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
Problems such as broken cover locks or indicator LEDs not working	<ul style="list-style-type: none"> • Broken CRU/FRU

Hard disk drive error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
Not all drives are recognized by the hard disk drive diagnostic test (Fixed Disk test).	<ol style="list-style-type: none"> 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.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
System stops responding during hard disk drive diagnostic test.	<ol style="list-style-type: none"> 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.

Intermittent error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
A problem occurs only occasionally and is difficult to detect.	<ol style="list-style-type: none"> 1. Verify that: <ul style="list-style-type: none"> • All cables and cords are connected securely to the rear of the server and attached options. • 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 causes the server to overheat and shut down. • Ensure that 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. 3. See “Undetermined problems” on page 119.

Keyboard, mouse, or pointing device error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
All or some keys on the keyboard do not work.	<ol style="list-style-type: none"> 1. See http://www.ibm.com/servers/eserver/serverproven/compat/us/ for keyboard compatibility. 2. Verify that: <ul style="list-style-type: none"> • The keyboard cable is securely connected to the system, and the keyboard and mouse cables are not reversed. • The server and the monitor are turned on. 3. Keyboard. 4. System board.
The mouse or pointing device does not work.	<ol style="list-style-type: none"> 1. The mouse is compatible with the server. See http://www.ibm.com/servers/eserver/serverproven/compat/us/. 2. Verify that: <ul style="list-style-type: none"> • 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. 3. Mouse or pointing device. 4. System board.

Memory error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
The amount of system memory displayed is less than the amount of physical memory installed.	<ol style="list-style-type: none"> Verify that: <ul style="list-style-type: none"> 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 on the DIMMs are enabled. The server might have automatically disabled a DIMM bank when it detected a problem or a DIMM bank could have been manually disabled. Check POST error log for error message 289: <ul style="list-style-type: none"> 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: <ol style="list-style-type: none"> Start the Configuration/Setup Utility program. Enable the DIMM. Save the configuration and restart the server. DIMM. System board.

Microprocessor error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
The server emits a continuous tone during POST. (The startup (boot) microprocessor is not working properly.)	<ol style="list-style-type: none"> Verify that the startup microprocessor is seated properly. (Trained service technician only) Remove microprocessor 2 and restart the server. <ul style="list-style-type: none"> If no beep code occurs, microprocessor 2 might have failed; replace the microprocessor. If the beep code remains, remove microprocessor 1 and install microprocessor 2 in the connector for microprocessor 1; then, restart the server. If no beep code occurs, microprocessor 1 might have failed; replace the microprocessor. Startup microprocessor.

Monitor error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
Monitor problems (general).	<p>Some IBM monitors have their own self-tests. If you suspect a problem with the monitor, refer to the information that comes with the monitor for adjusting and testing instructions.</p> <ol style="list-style-type: none"> Monitor. Run video diagnostics. If diagnostics pass, the problem may be a video driver. Display adapter / system board.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
The screen is blank.	<ol style="list-style-type: none"> 1. Verify that: <ul style="list-style-type: none"> • The server power cord is connected to the server and a working electrical outlet. • The monitor cables are connected properly. • The monitor is turned on and the brightness and contrast controls are adjusted correctly. • If the servers are C2T chained together, verify that: <ul style="list-style-type: none"> – The C2T chain cables are securely connected to the servers. – The C2T breakout cable is connected properly. – A server that is turned on is selected. <p>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 to reset the CMOS values to the default configuration (memory connector or bank of connectors enabled).</p> <p>If you have installed a Remote Supervisor Adapter II in the server and the adapter has a video connector, make sure that the video cable is connected to the Remote Supervisor Adapter II.</p> 2. Make sure that damaged BIOS code is not affecting the video; see “Recovering the BIOS code” on page 77. 3. If you have verified these items and the screen remains blank, replace: <ol style="list-style-type: none"> a. Monitor b. Video adapter, if installed c. System board
Only the cursor appears.	<ul style="list-style-type: none"> • See “Undetermined problems” on page 119
The monitor works when you turn on the server but goes blank when you start some application programs.	<ol style="list-style-type: none"> 1. Verify that: <ul style="list-style-type: none"> • The application program is not setting a display mode higher than the capability of the monitor. • The primary monitor cable is connected to the C2T device breakout cable. • You installed the necessary device drivers for the applications. 2. If you have verified these items and the screen remains blank, replace the monitor.
The screen is wavy, unreadable, rolling, distorted, or has screen jitter.	<ol style="list-style-type: none"> 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. (Moving a color monitor while it is turned on might cause screen discoloration.) Then move the device and the monitor at least 305 mm (12 in.) apart. Turn on the monitor. <p>Notes:</p> <ol style="list-style-type: none"> a. To prevent diskette drive read/write errors, make sure that 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. Video adapter, if installed. 3. System board.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.	
Symptom	FRU/action
Wrong characters appear on the screen.	<ol style="list-style-type: none"> 1. If the wrong language is displayed, update the BIOS code with the correct language. 2. Video adapter, if installed. 3. System board.
No video.	Make sure that all cables are connected correctly and securely. If you have installed a Remote Supervisor Adapter II in the server and the adapter has a video connector, make sure that the video cable is connected to the Remote Supervisor Adapter II.

Option error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.	
Symptom	FRU/action
An IBM option that was just installed does not work.	<ol style="list-style-type: none"> 1. Verify that: <ul style="list-style-type: none"> • The option is designed for the server (see the ServerProven list at http://www.ibm.com/servers/eserver/serverproven/compat/us/). • 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.	<ol style="list-style-type: none"> 1. Verify that all of the option hardware and cable connections are secure. 2. If the option comes with its own test instructions, use those instructions to test the option. 3. If the failing option is a SCSI option, verify that: <ul style="list-style-type: none"> • The cables for all external SCSI options are connected correctly. • The last option in each SCSI chain, or the end of the SCSI cable, is terminated correctly. • Any external SCSI option is turned on. You must turn on an external SCSI option before turning on the server. 4. Failing option.

Power error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.	
Symptom	FRU/action
The power switch does not work and the reset button, if supported, does work.	<ol style="list-style-type: none"> 1. Reseat the connector. 2. Power switch card. 3. System board.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
The server does not turn on.	<ol style="list-style-type: none"> 1. Verify that: <ul style="list-style-type: none"> • The power cables are properly connected to the server. • The electrical outlet functions properly. • The type of memory installed is supported by the server, and that functional DIMMs are installed in slots 1 and 2. • 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. 2. If LEDs for microprocessors or VRMs are on, verify that: <ol style="list-style-type: none"> a. A VRM is installed if a second microprocessor is present. b. All microprocessors have the same speed. 3. Override front panel power button: <ol style="list-style-type: none"> a. Disconnect server power cords. b. Install a jumper on the force power-on jumper (J40). c. Reconnect power cords. <p>If server turns on:</p> <ol style="list-style-type: none"> a. Service processor (baseboard management controller) error. b. Operator information card. <p>If server does not turn on:</p> <ul style="list-style-type: none"> • System board
The server does not turn off.	<ol style="list-style-type: none"> 1. Verify whether you are using an ACPI or non-ACPI operating system. If you are using a non-ACPI operating system: <ol style="list-style-type: none"> a. Press Ctrl+Alt+Delete. b. Turn off the system by holding the power-control button for 4 seconds. c. If server 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 operating system with Advanced Configuration and Power Management (ACPI) awareness, suspect the system board. The procedure to check for ACPI is to locate the file named HAL.dll; ACPI is present if the internal name HALACPI.dll appears after you right-clicking on the HAL.dll file name → choose Properties → select Version tab → click Internal Name.

Serial port error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
The number of serial ports identified by the operating system is less than the number of serial ports installed.	<ol style="list-style-type: none"> 1. Verify that: <ul style="list-style-type: none"> • Each port is assigned a unique address by 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 “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
A serial device does not work.	<ol style="list-style-type: none"> 1. Verify that: <ul style="list-style-type: none"> • 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 “Input/output connectors” on page 49). 2. Failing serial device. 3. Serial adapter, if installed. 4. System board.

ServerGuide error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
The <i>ServerGuide Setup and Installation</i> CD will not start.	<ul style="list-style-type: none"> • Verify that the server is supported and has a startable (bootable) CD-ROM drive. • If the startup (boot) sequence settings have been altered, ensure that the CD-ROM drive is first in the startup sequence. • If more than one CD-ROM drive is installed, ensure that only one drive is set as the primary drive. Start the CD from the primary drive.
The SCSI RAID program cannot view all installed drives, or the NOS cannot be installed.	<ul style="list-style-type: none"> • Verify that there are no duplicate SCSI IDs or IRQ assignments. • Verify that the hard disk drive is connected properly.
The operating system installation program continuously loops.	<ul style="list-style-type: none"> • Make more space available on the hard disk.
The ServerGuide program will not start the operating-system CD.	<ul style="list-style-type: none"> • Verify that the operating-system CD you have is supported by the ServerGuide program. See the <i>ServerGuide Setup and Installation</i> CD label for a list of supported operating system versions.
The operating system cannot be installed; the option is not available.	<ul style="list-style-type: none"> • Verify that the operating system is supported on the server. If the operating system is supported, there is no logical drive defined (SCSI RAID systems). Run the ServerGuide program, and ensure that setup is complete.

Software error symptoms

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
Suspected software problem.	<ol style="list-style-type: none"> To determine if problems are caused by the software, verify that: <ul style="list-style-type: none"> 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, you 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 system. <p>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.</p> If you have verified these items and the problem remains, contact the place of purchase.

Service processor error codes

When viewed in the system-error log, the Remote Supervisor Adapter II SlimLine messages will appear as text descriptions. To determine a possible error condition for the Remote Supervisor Adapter II SlimLine, see the system-error log (see “Viewing the system-error log from diagnostic programs” on page 70).

ServeRAID error codes

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

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
1xxx (Microcode checksum error)	<ol style="list-style-type: none"> ServeRAID controller
2xxx (Code DRAM error)	<ol style="list-style-type: none"> Install download jumpers, flash latest level BIOS and firmware for controller. Remove jumpers. ServeRAID controller.
3000-31XX (Code DRAM error)	<ol style="list-style-type: none"> Install download jumpers, flash latest level BIOS and firmware for controller. Remove jumpers. ServeRAID controller.
3200 (Code DRAM error)	<ol style="list-style-type: none"> Install download jumpers, flash latest level BIOS code and firmware for controller. Remove jumpers. ServeRAID controller.
3300 (ServeRAID-5i only)	<ol style="list-style-type: none"> Install ServeRAID-5i controller in an extended PCI expansion slot. See the documentation that came with the server for more information.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
3E20 (ServeRAID-5i only)	<ol style="list-style-type: none"> 1. Remove the ServeRAID-5i controller from its slot and install it in the proper PCI option slot. 2. Verify that the ServeRAID-5i controller is supported in this server. 3. ServeRAID-5i controller. 4. System board.
3E2x	<ol style="list-style-type: none"> 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)	<ol style="list-style-type: none"> 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)	<ol style="list-style-type: none"> 1. Reseat daughter card. 2. Install download jumpers, flash latest level BIOS code and firmware for controller; then, remove jumpers. 3. ServeRAID controller.
7xxx thru 8xxx (Host/local PCI bus interface error)	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Follow indications at “POST (ISPR) error procedures” on page 113. Follow those instructions before continuing with the next steps listed in this index. 2. SCSI cable. 3. SCSI backplane. 4. Hard disk drive. 5. ServeRAID controller.
EFFE (Firmware code corrupt or download jumpers are in place)	<ol style="list-style-type: none"> 1. Flash latest level BIOS and firmware for controller; then, remove jumpers. 2. ServeRAID controller.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
FFFF or other code not listed	<ol style="list-style-type: none"> 1. Follow indications at “POST (ISPR) error procedures.” 2. SCSI cable. 3. SCSI backplane. 4. Hard disk drive. 5. ServeRAID controller.

POST (ISPR) error procedures

Use the ISPR error procedures to help you solve ServeRAID problems. A complete list of error codes is listed at “ServeRAID error codes” on page 111.

Note: Where the ISPR Error Procedures refer to a SCSI 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 either by cables, termination, defective drives, etc.)

1. Isolate between SCSI subsystem and controller by disconnecting all SCSI cables from suspect card, and reboot.

CAUTION:

Do not press F5. Doing so changes the server’s 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, press **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 server’s onboard integrated SCSI controller.

Table 5. SCSI identifier

SCSI Channel Code (z)	Descriptions
1	Channel 1
2	Channel 2
3	Channel 1 & 2

Table 5. SCSI identifier (continued)

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

- b. Confirm that the channel(s) identified from the error in step 2a on page 113 is (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 DASD status cables. Reconnect all cables removed in step 1 on page 113.
- f. Disconnect one drive at a time attached to the channel identified in step 2a on page 113; then, reboot to determine which drive is causing the error.
- g. Replace SCSI cable.
- h. Replace SCSI 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 SCSI cables attached to the suspect card, and reboot.

CAUTION:

Do not press F5. Doing so will change the server's configuration.

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

- a. Identify which channel is causing the error by reconnecting cables one at a time and rebooting 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 on page 114 and reboot each time to determine which drive is causing the problem.
 - d. Replace SCSI cable attached to channel identified in step 2a on page 114.
 - e. Replace backplane attached to channel identified in step 2a on page 114.
3. If original ISPR code is still present after disconnecting all SCSI cables and rebooting, perform the following actions until the error is no longer present:
 - Reseat the controller
 - Replace the controller

SCSI error codes

Error code	FRU/action
<p>All SCSI Errors One or more of the following might be causing the problem:</p> <ul style="list-style-type: none"> • 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 	<ol style="list-style-type: none"> 1. External SCSI devices must be turned on before you turn on the server. 2. Make sure that the cables for all external SCSI devices are connected correctly. 3. If you have attached an external SCSI device to the server, make sure the external SCSI termination is set to automatic. 4. Make sure that the last device in each SCSI chain is terminated correctly. 5. Make sure that the SCSI devices are configured correctly.

Temperature error messages

<p>Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.</p>	
Message	FRU/action
<p>DASD Over Temperature (level-critical; direct access storage device bay x was over temperature)</p>	<ul style="list-style-type: none"> • Ensure that the system is being properly cooled; see “System reliability considerations” on page 15.
<p>DASD Over recommended Temperature (sensor x) (level-warning; DASD bay x had over temperature condition)</p>	<ul style="list-style-type: none"> • Ensure that the system is being properly cooled; see “System reliability considerations” on page 15.
<p>DASD under recommended temperature (sensor x) (level-warning; direct access storage device bay x had under temperature condition)</p>	<ul style="list-style-type: none"> • Ambient temperature must be within normal operating specifications; see “Features and specifications” on page 3.
<p>DASD Over Temperature (level-critical; sensor for DASD1 reported temperature over recommended range)</p>	<ul style="list-style-type: none"> • Ensure system is being properly cooled; see “System reliability considerations” on page 15.
<p>Power supply x Temperature Fault (level-critical; power supply x had over temperature condition)</p>	<ol style="list-style-type: none"> 1. Ensure system is being properly cooled; see “System reliability considerations” on page 15. 2. Replace power supply x

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Message	FRU/action
System board is over recommended temperature (level-warning; system board is over recommended temperature)	<ol style="list-style-type: none"> 1. Ensure system is being properly cooled; see “System reliability considerations” on page 15. 2. Replace the system board.
System board is under recommended temperature (level-warning; system board is under recommended temperature)	<ul style="list-style-type: none"> • Ambient temperature must be within normal operating specifications; see “Features and specifications” on page 3
System over temperature for CPU x (level-warning; CPU x reporting over temperature condition)	<ul style="list-style-type: none"> • Ensure system is being properly cooled; see “System reliability considerations” on page 15.
System under recommended CPU x temperature (level-warning; system reporting under temperature condition for CPU x)	<ul style="list-style-type: none"> • Ambient temperature must be within normal operating specifications; see “Features and specifications” on page 3

Fan error messages

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Message	FRU/action
Fan x failure (level-critical; fan x had a failure)	<ol style="list-style-type: none"> 1. Check connections to fan x. 2. Replace fan x.
Fan x fault (level-critical; fan x beyond recommended RPM range)	<ol style="list-style-type: none"> 1. Check connections to fan x. 2. Replace fan x.
Fan x outside recommended speed action	<ol style="list-style-type: none"> 1. Replace fan x.

Power error messages

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Message	FRU/action
Power supply x current share fault (level-critical; excessive current demand on power supply x)	<ul style="list-style-type: none"> • Replace power supply x.
Power supply x DC good fault (level-critical; power good signal not detected for power supply x)	<ul style="list-style-type: none"> • Replace power supply x.
Power supply x temperature fault	<ul style="list-style-type: none"> • Replace power supply x.
Power supply x removed	<ul style="list-style-type: none"> • No action required - information only.
Power supply x fan fault (level-critical; fan fault in power supply x)	<ul style="list-style-type: none"> • Replace power supply x.
Power supply x 12 V fault (level-critical; overcurrent condition detected)	<ul style="list-style-type: none"> • See “Power checkout” on page 79.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Message	FRU/action
Power supply x 3.3 V fault (level-critical; 3.3 V power supply x had an error)	<ul style="list-style-type: none"> • See “Power checkout” on page 79.
Power supply x 5 V fault (level-critical; 5 V power supply x had an error)	<ul style="list-style-type: none"> • See “Power checkout” on page 79.
System running non-redundant power (level-noncritical; system does not have redundant power)	<ol style="list-style-type: none"> 1. Add another power supply. 2. Remove options from system. 3. System can continue to operate without redundancy protection if steps 1 and 2 are not followed.
System under recommended voltage for x (level-warning; indicated voltage supply under nominal value; value for x can be +12, -12, or +5)	<ol style="list-style-type: none"> 1. Check connections to the power subsystem. 2. Power supply.

System shutdown

Refer to the following tables when experiencing system shutdown related to voltage or temperature problems.

Voltage related system shutdown

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Message	FRU/action
System shutoff due to x current over max value (level-critical; system drawing too much current on voltage x bus)	<ul style="list-style-type: none"> • See “Power checkout” on page 79.
System shutoff due to x V over voltage (level-critical; system shutoff due to x supply over voltage)	<ol style="list-style-type: none"> 1. Check the power-supply connectors 2. Power supply.
System shutoff due to x V under voltage (level-critical; system shutoff due to x supply under voltage)	<ol style="list-style-type: none"> 1. Check the power-supply connectors 2. Power supply.
System shutoff due to VRM x over voltage	<ul style="list-style-type: none"> • Replace VRM x.
System shutoff due to excessive (< 240 VA) loading	<ol style="list-style-type: none"> 1. See “Power checkout” on page 79. 2. Cycle ac on/off.

Temperature related system shutdown

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Message	FRU/action
System shutoff due to board over temperature (level-critical; board is over temperature)	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see “System reliability considerations” on page 15. 2. Replace board.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Message	FRU/action
System shutoff due to CPU x over temperature (level-critical; CPU x is over temperature)	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see “System reliability considerations” on page 15. 2. Replace CPU x.
System shutoff due to CPU x under temperature (level-critical; CPU x is under temperature)	<ul style="list-style-type: none"> • Ambient temperature must be within normal operating specifications; see “Features and specifications” on page 3
System shutoff due to DASD temperature (sensor x) (level-critical; DASD area reported temperature outside recommended operating range)	<ul style="list-style-type: none"> • Ensure that the system is being properly cooled; see “System reliability considerations” on page 15.
System shutoff due to high ambient temperature (level-critical; high ambient temperature)	<ul style="list-style-type: none"> • Ambient temperature must be within normal operating specifications; see “Features and specifications” on page 3
System shutoff due to system board under temperature (level-critical; system board is under temperature)	<ul style="list-style-type: none"> • Ambient temperature must be within normal operating specifications; see “Features and specifications” on page 3

DASD checkout

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Message	FRU/action
Hard drive x removal detected (level-critical; hard drive x has been removed)	<ul style="list-style-type: none"> • Information only, take action as appropriate.

Host built-in self test (BIST)

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Message	FRU/action
Host fail (level-informational; built-in self-test for the host failed)	<ol style="list-style-type: none"> 1. Reseat the microprocessor. 2. Reseat the VRM. 3. Replace the microprocessor CPU.

Bus fault messages

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Bus fault messages	FRU/action
Failure reading I2C device. Check devices on bus 0.	<ul style="list-style-type: none"> • If installed, reseat the Remote Supervisor Adapter.
Failure reading I2C device. Check devices on bus 1.	<ul style="list-style-type: none"> • System board.

Note: See “System replaceable units” on page 122 to determine which components should be replaced by a field service technician.

Bus fault messages	FRU/action
Failure reading I2C device. Check devices on bus 2.	<ul style="list-style-type: none"> • System board.
Failure reading I2C device. Check devices on bus 3.	<ol style="list-style-type: none"> 1. Reseat the cable between the SCSI backplane and the system board (see “System-board internal connectors” on page 61. 2. SCSI backplane. 3. Operator information panel. 4. Power supply. 5. System board.
Failure reading I2C device. Check device on bus 4.	<ul style="list-style-type: none"> • System board

Undetermined problems

Use the information in this section if the diagnostic tests did not identify the failure, the devices list is incorrect, or the system is inoperative.

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, use the password reset jumper to override the power-on password and clear the CMOS memory; see “Erasing a lost or forgotten password (clearing CMOS memory)” on page 78. If you suspect that the BIOS code is damaged, see “Recovering the BIOS code” on page 77.

Check the LEDs on all the power supplies (see “Hot-swap power-supply LED errors” on page 96). If the LEDs indicate the power supplies are working correctly, complete the following steps:

1. Turn off the server.
2. Be sure 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 each time):
 - Any external devices
 - Surge suppressor device (on the server)
 - Modem, printer, mouse, or non-IBM devices
 - Each adapter
 - Drives
 - Memory modules (minimum requirement = two 256 MB DIMMs)

Note: Minimum operating requirements are:

- a. Power supply
 - b. Power backplane
 - c. System board
 - d. One microprocessor and VRM
 - e. Memory (with a minimum of two 256 MB DIMMs)
 - f. Front operator panel
 - g. Two fan backplanes
4. Turn on the server. If the problem remains, suspect the following FRUs in the order listed:
 - Power supply
 - System board

Notes:

1. If the problem goes away when you remove an adapter from the system and replacing that adapter does not correct the problem, suspect the system board.
2. If you suspect a networking problem and all the system tests pass, suspect a network cabling problem external to the system.

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
 - Do diagnostics fail?
 - What message appears in the diagnostics log?
 - What, when, where, single, or multiple systems?
 - Is the failure repeatable?
 - Has this configuration ever worked?
 - If it has been working, what changes were made prior to it failing?
 - Is this the original reported failure?
- Diagnostics version
 - Type and version level
- Hardware configuration
 - Print (print screen) configuration currently in use
 - BIOS level
- Operating system software
 - Type and version level

Note: To eliminate confusion, identical systems are considered identical only if they:

- Are the exact machine type and models
- Have the same BIOS level
- Have the same adapters/attachments in the same locations
- Have the same address jumpers/terminators/cabling
- Have the same software versions and levels
- Have the same diagnostics code (version)
- Have the same configuration options set in the system
- Have the same setup for the operation system control files

Comparing the configuration and software set-up between “working” and “non-working” systems will often lead to problem resolution.

Chapter 7. Parts listing, Type 1879 and Type 8837

This parts listing supports the xSeries 336 Type 1879 and Type 8837. To check for an updated parts listing on the Web, complete the following steps:

1. Go to <http://www.ibm.com/support/>
2. Under **Search technical support**, type 8863 and click **Search**.
3. Under Document type, select **Parts information** and click **Go**.

System

The main replaceable components of the xSeries 336 Type 1879 and Type 8837 are shown in Figure 67.

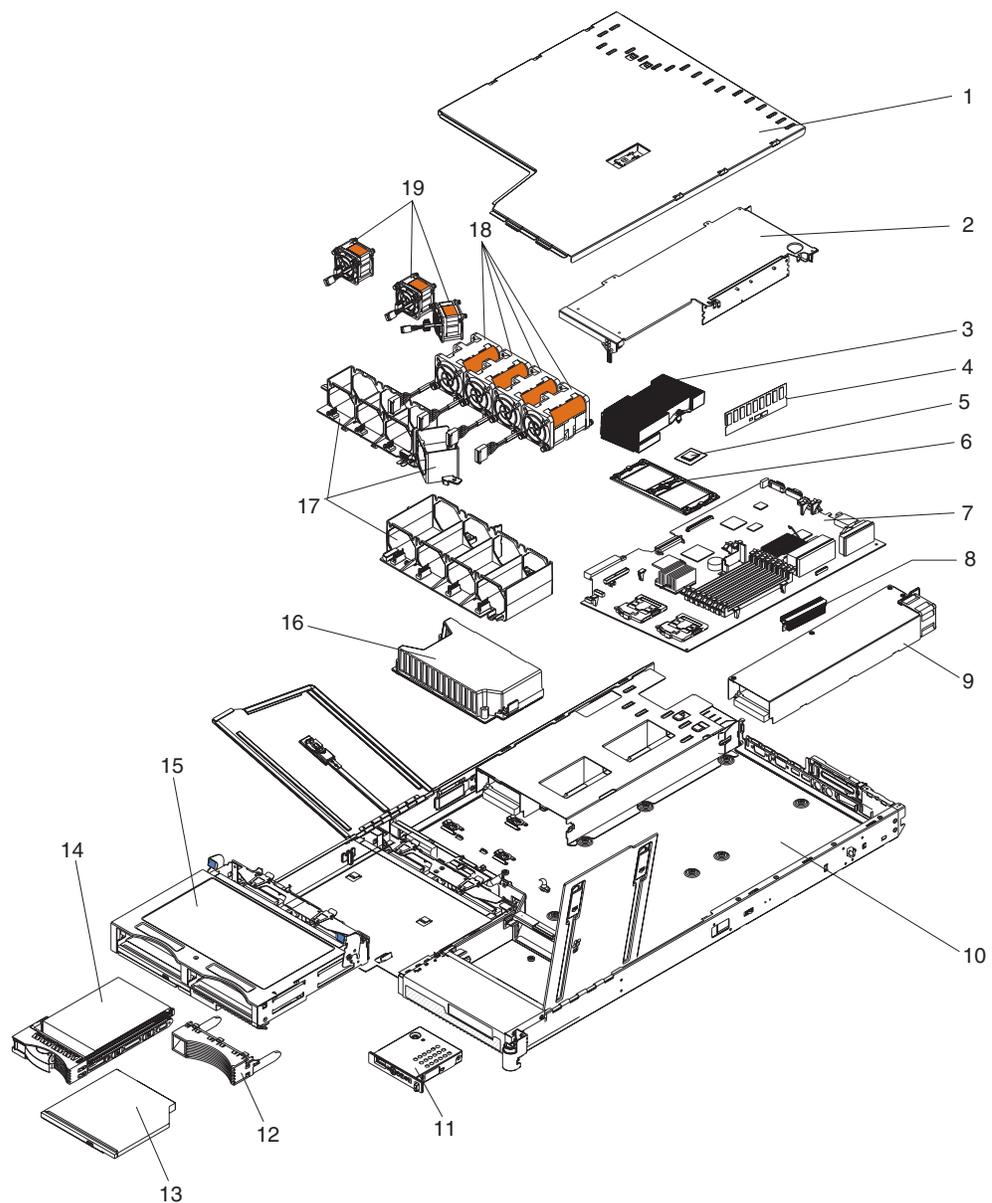


Figure 67. Parts, Type 1879 and Type 8837

System replaceable units

Notes:

- Field replaceable units (FRUs) must be serviced only by qualified field service technicians.
- Customer replaceable units (CRUs) can be replaced by the customer. Tier 1 CRUs and Tier 2 CRUs are described in the IBM “Statement of Limited Warranty” (at “Part 3 – Warranty Information”), which is in the *Installation Guide*.

Index	System xSeries 336 Type 1879 and Type 8837	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
1	Top cover (all models)	23K4219		
2	Riser assembly, PCI-X 1.0 half-high (all models) (see “Major components of the xSeries 336 Type 8837 server” on page 17)			90P1957
2	Riser assembly, PCI-X full-high (option) (see “Major components of the xSeries 336 Type 8837 server” on page 17)		40K8161	
2	Riser assembly, PCI full-high (all models) (see “Major components of the xSeries 336 Type 8837 server” on page 17)		40K8158	
3	Heat sink (all models except 0Rx, 0Sx, 0Tx, 1Rx, 1Sx, 1Tx, 2Rx, 3Rx, 3Sx, 3Tx, 4Rx, 5Rx, 5Sx, 5Tx, D1x, DAx, DRx, DSx)			90P5281
3	Heat sink (models D1x, DAx)			39R9058
3	Dummy heat sink (models D1x, DAx, DRx, DSx)			42C4027
4	Memory, 256MB ECC DRR (models 01x, 02x)	90P1123		
4	Memory, 512MB ECC DRR (all models except 01x, 02x, D1x, DAx, DRx, DSx)	13N1424		
4	Memory, 1GB ECC DRR2 (models D1x, DAx, DRx, DSx)	73P2870		
5	Microprocessor, 2.8GHz (models 01x, 02x)			13N1618
5	Microprocessor, 2.8GHz (models D1x, DAx, DRx, DSx)			40K1643
5	Microprocessor, 2.8GHz (models 05x, 06x, 0Rx, 0Sx, 0Tx, 0Wx)			39R7569
5	Microprocessor, 3.0GHz (model 11x)			90P1033
5	Microprocessor, 3.0GHz (models 15x, 16x, 1Rx, 1Sx, 1Tx, 1Vx)			13M8293
5	Microprocessor, 3.2GHz (models 21x, 22x, 2Ax)			13N2357
5	Microprocessor, 3.2GHz (models 25x, 2Rx)			13M8294
5	Microprocessor, 3.4GHz (model 31x)			13N2358
5	Microprocessor, 3.4GHz (models 35x, 36x, 3Rx, 3Sx, 3Tx, 3Vx)			13M8295
5	Microprocessor, 3.6GHz (models 41x, 42x, 4Ax)			13N2359
5	Microprocessor, 3.6GHz (models 45x, 4Rx)			13M8296
5	Microprocessor, 3.8GHz (models 55x, 5Rx, 5Sx, 5Tx, 5Vx,)			39R7571
6	Heat sink retention module (all models)			90P5282
7	System board (all models except 0Rx, 0Sx, 0Tx, 1Rx, 1Sx, 1Tx, 2Rx, 3Rx, 3Sx, 3Tx, 4Rx, 5Rx, 5Sx, 5Tx, D1x, DAx, DRx, DSx)			32R1730
7	System board (models D1x, DAx)			39Y6782
7	System board (all models except D1x, DAx)			39Y6958
8	VRM, 1U/75A (all models except 0Rx, 0Sx, 0Tx, 1Rx, 1Sx, 1Tx, 2Rx, 3Rx, 3Sx, 3Tx, 4Rx, 5Rx, 5Sx, 5Tx, DRx, DSx)	24R2698		
8	VRM, 1U/75A (models D1x, DAx)	39Y7261		

Index	System xSeries 336 Type 1879 and Type 8837	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
9	Power supply, 585 watt (all models except 0Rx, 0Sx, 0Tx, 1Rx, 1Sx, 1Tx, 2Rx, 3Rx, 3Sx, 3Tx, 4Rx, 5Rx, 5Sx, 5Tx, DRx, DSx)	24R2640		
9	Power supply, 585 watt (all models)	39Y7169		
10	Chassis (all models)			90P5284
11	Operator information panel (all models)			39Y6912
12	Bezel filler panel, hard disk drive (models 01x, 11x, 21x, 31x, 41x, Dx1)	59P5236		
13	DVD drive, 8/24X, primary (models 01x, 02x, 05x, 06x, 0Wx, 15x, 16x, 21x, 22x, 25x, 31x, 35x, 36x, 41x, 42x, 45x, 5Vx, 55x, 56x, D1x)		26K5403	
13	DVD drive, 8/24X, alternate (models 01x, 02x, 05x, 06x, 0Wx, 15x, 16x, 21x, 22x, 25x, 31x, 35x, 36x, 41x, 42x, 45x, 5Vx, 55x, 56x, D1x)		26K5405	
13	CD-RW/DVD drive, 8/24X (models 0Rx, 0Tx, 1Rx, 1Tx, 1Rx, 1Tx, 2Rx, 3Rx, 3Tx, 4Rx, 5Rx, 5Tx, DRx)		39M3545	
14	SATA cartridge (models 02x, 06x, 0Tx, 16x, 1Tx, 22x, 36x, 3Tx, 42x, 56x, 5Tx)		23K4209	
15	Cage assembly, 3.5 in. SCSI hard disk drive, with CD and hard disk drive backplanes (models 01x, 05x, 0Rx, 11x, 15x, 1Rx, 21x, 25x, 2Rx, 31x, 35x, 3Rx, 41x, 45x, 4Rx, 55x, 5Rx, D1x, DRx)		26K8042	
15	Cage assembly, 2.5 in. SCSI hard disk drive, with hard disk drive backplanes (models 0Sx, 0Wx, 1Sx, 1Vx, 2Ax, 3Sx, 3Vx, 4Ax, 5Sx, 5Vx, DAx, DSx)		23K4205	
16	Power backplane (all models)		40K8157	
17	Fan holder (all models)		40K8156	
18	Fan, 40x40x56 (all models)	40K8140		
19	Fan, 40x40x28 (all models)	40K8139		
	Alcohol wipe (all models)			59P4739
	Battery, 3.0V (all models)	33F8354		
	Bezel filler panel, SATA drive (models 02x, 22x, 42x)	23K4990		
	Cable, 3.5 inch SCSI power (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x, D1x)		23K4204	
	Cable assembly, 2.5 inch SCSI with power cable, signal cable, and bracket (models 05x, 0Wx, 1Vx, 2Ax, 3Vx, 4Ax, DAx)		23K4206	
	Cable, DVD IDE (all models except 0Sx, 0Wx, 1Sx, 1Vx, 2Ax, 3Sx, 3Vs, 3Xx, 4Ax, 5Sx, 5Sx, DAx, DSx)		40K8152	
	Cable, fan power (all models)			40K8160
	Cable management arm (all models)	90P1958		
	Cable, signal, front panel (all models except 0Rx, 0Sx, 0Tx, 1Rx, 1Sx, 1Tx, 2Rx, 3Rx, 3Sx, 3Tx, 4Rx, 5Rx, 5Sx, 5Tx, DRx, DSx)		25R4052	
	Cable, signal, SCSI (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x, D1x)		33P2353	
	Cord, 530mm/10A (all models)	39M5401		
	Filler panel (models 2Ax, 4Ax, DAx)	26K8680		

Index	System xSeries 336 Type 1879 and Type 8837	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
	Grease (all models)			59P4740
	Kit, miscellaneous parts (all models) <ul style="list-style-type: none"> • Bezel blank filler • EIA bracket assembly, left • EIA bracket assembly, right • Rail set, DVD • Power supply filler • Screw, 3.5mm • Screw, M3.5 steel 		90P5285	
	Kit, toolless rail (all models)	23K4218		
	Line cord (all models)	36L8886		
	Power cord (all models)	6952300		
	Service label (all models except 0Rx, 0Sx, 0Tx, 1Rx, 1Sx, 1Tx, 2Rx, 3Rx, 3Sx, 3Tx, 4Rx, 5Rx, 5Sx, 5Tx, D1x, DAx, DRx, DSx)	23K4220		
	Service label (models 0Rx, 0Sx, 0Tx, 1Rx, 1Sx, 1Tx, 2Rx, 3Rx, 3Sx, 3Tx, 4Rx, 5Rx, 5Sx, 5Tx, DRx, DSx)	40K8138		
	Service label (models D1x, DAx)	40K8137		
	Service label, generic (all models)	23K4991		
	USB connector cable, front panel (all models)			40K8159
	Bezel filler panel, DVD drive (option)	26K4300		
	Hard disk drive, 36 GB/10k (option)	39R7332		
	Hard disk drive, 36 GB/15k (option)	39R7314		
	Hard disk drive, 36.4 GB U320 SCSI (option)	90P1300		
	Hard disk drive, 73 GB/10k (option)	39R7308		
	Hard disk drive, 73 GB/10k (option)	39R7334		
	Hard disk drive, 73 GB/15k (option)	39R7316		
	Hard disk drive, 73.4 GB U320 SCSI (option)	90P1301		
	Hard disk drive, 80 GB SATA (option)	71P7293		
	Hard disk drive, 80 GB SATA (option)	39M4503		
	Hard disk drive, 146 GB/10k GB SATA (option)	39R7310		
	Hard disk drive, 160 GB SATA (option)	39M3702		
	Hard disk drive, 250 GB SATA (option)	39M4511		
	Hard disk drive, 300 GB/10k (option)	39R7312		
	Tray assembly, SATA drive (option)		73P8007	
	Y cord, 1345 mm (option)		25R2567	

Keyboard CRUs

Keyboard	CRU No.
US English	37L2551
French Canadian	37L2552
LA Spanish	37L2553
Arabic	37L2555
Belgium/French	37L2556

Keyboard	CRU No.
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, French/German	37L2578
Turkish	37L2579
Turkish	37L2580
UK English	37L2581
Yugosl/Lat	37L2582
US English-EMEA	37L2583
Chinese/US	37L2585
Thailand	37L2587
French Canadian	37L0913

Power cords (CRUs)

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.

IBM power cord part number	Used in these countries and regions
02K0546	China
13F9940	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea
13F9979	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, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Laos (People's 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
13F9997	Denmark
14F0015	Bangladesh, Lesotho, Maceo, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda
14F0033	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dominica, Gambia, Ghana, Grenada, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Polynesia, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad and Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Italy, Libyan Arab Jamahiriya
14F0087	Israel
1838574	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Colombia, 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 of America, Venezuela
24P6858	Korea (Democratic People's Republic of), Korea (Republic of)
34G0232	Japan
36L8880	Argentina, Paraguay, Uruguay
49P2078	India
49P2110	Brazil
6952300	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States of America, Venezuela

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 section 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 and any optional devices are 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 *Problem Determination and Service Guide* on the *IBM Documentation CD* that comes with your system.
- Go to the IBM support Web site at <http://www.ibm.com/systems/support/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

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

Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, 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/systems/support/> and follow the instructions. Also, some documents are available through the IBM Publications Center at <http://www.ibm.com/shop/publications/order/>.

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 systems, optional devices, services, and support. The address for IBM System x™ and xSeries information is <http://www.ibm.com/systems/x/>. The address for IBM BladeCenter® information is <http://www.ibm.com/systems/bladecenter/>. The address for IBM IntelliStation information is <http://www.ibm.com/intellistation/>.

You can find service information for IBM systems and optional devices at <http://www.ibm.com/systems/support/>.

Software service and support

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

For more information about Support Line and other IBM services, see <http://www.ibm.com/services/>, or see <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 your IBM reseller or IBM Services. To locate a reseller authorized by IBM to provide warranty service, go to <http://www.ibm.com/partnerworld/> and click **Find a Business Partner** on the right side of the page. For IBM support telephone numbers, see <http://www.ibm.com/planetwide/>. 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.

IBM Taiwan product service

台灣 IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

IBM Taiwan product service contact information:
IBM Taiwan Corporation
3F, No 7, Song Ren Rd.
Taipei, Taiwan
Telephone: 0800-016-888

Appendix B. Safety 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.

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 procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect	To Disconnect
<ol style="list-style-type: none">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.	<ol style="list-style-type: none">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.

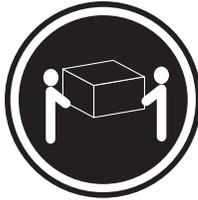


DANGER

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.

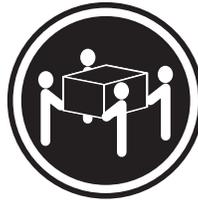
Statement 4



≥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.



Statement 10



CAUTION:

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



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

Instrução 2



CUIDADO:

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

Não:

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

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

Instrução 3



PRECAUCIÓN:

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

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

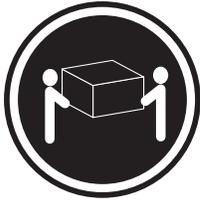


PERIGO

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

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

Instrução 4



≥18 kg (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 10

CUIDADO:

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



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。
将与本产品连接的所有设备连接至正确布线的插座上。
尽量只使用单手拆接信号电缆。
有水、火及结构损坏迹象时, 请勿打开任何设备。
除非在安装配置过程中有明确指示, 否则, 打开设备机盖前应先断开与电源线、远程通信系统、网络和调制解调器的所有连接。
安装、移动或打开本产品及其附带设备的机盖时, 应按下表所述连接和断开电缆。

连接时:

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

断开连接时:

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

声明 2



警告:

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

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

请勿对电池进行下列操作：
扔入或浸入水电
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)

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。
- 儘可能使用單手來連接或切斷信號電纜線。
- 當設備有火燒或泡水的痕跡，或有結構性損害時，請勿開啓該設備的電源。
- 在安裝及架構之時，若非非常熟悉，在開啓裝置蓋子之前，請切斷電源線、電信系統、網路及數據機。
- 在安裝、移動本產品或附加裝置，或開啓其蓋子時，請依照下表中「連接」及「切斷」電纜線的步驟執行。

連接：

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

切斷：

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

聲明 2



注意：

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

請勿將電池：

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

請遵照當地法令規章處理廢棄電池。

聲明 3



注意：

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

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



危險

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

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

聲明 4



≥ 18 公斤 (37 磅) ≥ 32 公斤 (70.5 磅) ≥ 55 公斤 (121.2 磅)

注意：

抬起裝置時，請注意安全措施。

聲明 5



注意：

裝置上的電源控制按鈕及電源供應器上的電源開關均無法關閉裝置上的電流。

本裝置可能有一條以上的電源線。如要移除裝置上的所有電流，請確認所有電源線已與電源分離。



聲明 10



注意：

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



>82 公斤 (180 磅)

Important:

Toutes les consignes Attention et Danger indiquées dans la bibliothèque 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
<ol style="list-style-type: none">1. Mettez les unités hors tension.2. Commencez par brancher tous les cordons sur les unités.3. Branchez les câbles d'interface sur des connecteurs.4. Branchez les cordons d'alimentation sur des prises.5. Mettez les unités sous tension.	<ol style="list-style-type: none">1. Mettez les unités hors tension.2. Débranchez les cordons d'alimentation des prises.3. Débranchez les câbles d'interface des connecteurs.4. Débranchez tous les câbles des unités.

Notice n° 2



ATTENTION:

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

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

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

Notice n° 3



ATTENTION:

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

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

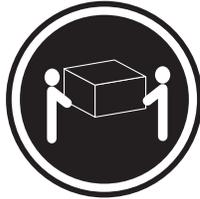


DANGER

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

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

Notice n° 4



≥18 kg (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° 10

ATTENTION:

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



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

Hinweis 2



ACHTUNG:

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

Die Batterie nicht:

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

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.

Hinweis 3



ACHTUNG:

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

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

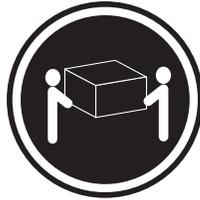


VORSICHT

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

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

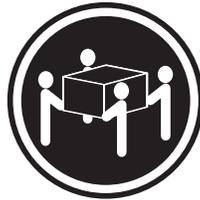
Hinweis 4



≥18 kg



≥32 kg



≥55 kg

ACHTUNG:

Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

Hinweis 5



ACHTUNG:

Mit dem Betriebsspannungsschalter an der Vorderseite des 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 10

ACHTUNG:

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



Importante:

Tutti gli avvisi di attenzione e di pericolo riportati nella pubblicazione 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:
<ol style="list-style-type: none">1. SPEGNERE tutti i dispositivi.2. Collegare prima tutti i cavi alle unità.3. Collegare i cavi di segnale ai connettori.4. Collegare i cavi di alimentazione alle prese elettriche.5. ACCENDERE le unità.	<ol style="list-style-type: none">1. SPEGNERE tutti i dispositivi.2. Rimuovere prima i cavi di alimentazione dalle prese elettriche.3. Rimuovere i cavi di segnale dai connettori.4. Rimuovere tutti i cavi dalle unità.

Avviso 2



ATTENZIONE:

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

Evitare di:

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

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

Avviso 3



ATTENZIONE:

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

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

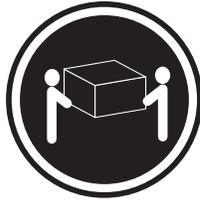


PERICOLO

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

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

Avviso 4



≥18 kg



≥32 kg



≥55 kg

ATTENZIONE:

Durante il sollevamento della macchina seguire delle norme di sicurezza.

Avviso 5



ATTENZIONE:

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



Avviso 10

ATTENZIONE:

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



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で始まっている場合は、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

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。
3. 次に、通信ケーブルをコネクタに接続する
4. その後、電源コンセントに電源コードを接続する
5. 装置の電源を入れる。

取り外すには

1. すべての電源を切る
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から取り外す。
4. その後、装置からすべてのケーブルを取り外す

・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。光線を見つめたり、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



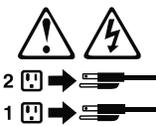
55kg 以上

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 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。



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, 전황 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다.

전기 충격을 피하려면:

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

연결하려면:

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

연결을 끊으려면:

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

경고문 2



주의:

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

다음은 주의하십시오.

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

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3



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

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

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



위험

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

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

경고문 4



≥18 kg (37 lbs)



≥ 32 kg (70.5 lbs)



≥ 55 kg (121.2 lbs)

주의:

기계를 들 때는 안전하게 들어 올리십시오.

경고문 5



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



경고문 10



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



>82 kg (180 lbs)

Importante:

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

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

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

Declaración 1



PELIGRO

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

Para evitar una descarga eléctrica:

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

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

Declaración 2



PRECAUCIÓN:

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

No realice las acciones siguientes:

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

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

Declaración 3



PRECAUCIÓN:

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

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

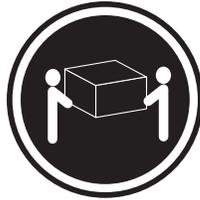


PELIGRO

Algunos productos láser contienen un diodo de láser incorporado de Clase 3A o de Clase 3B. Tenga en cuenta la advertencia siguiente.

Cuando se abre, hay radiación láser. No mire fijamente el rayo ni lleve a cabo ningún examen directamente con instrumentos ópticos; evite la exposición directa al rayo.

Declaración 4



≥18 kg



≥32 kg



≥55 kg

PRECAUCIÓN:

Tome medidas de seguridad al levantar el producto.

Declaración 5



PRECAUCIÓN:

El botón de control de alimentación del dispositivo y el interruptor de alimentación de la fuente de alimentación no apagan la corriente eléctrica suministrada al dispositivo. Es posible también que el dispositivo tenga más de un cable de alimentación. Para eliminar la corriente eléctrica del dispositivo, asegúrese de desconectar todos los cables de alimentación de la fuente de alimentación.



Declaración 10

PRECAUCIÓN:

No coloque ningún objeto que pese más de 82 kg (180 libras) encima de los dispositivos montados en bastidor.



Appendix C. Notices

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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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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/index.shtml> or contact your local waste disposal facility.

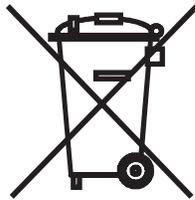
In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride,

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.

For Taiwan: Please recycle batteries.



For the European Union:



Notice: This mark applies only to countries within the European Union (EU).

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Les batteries ou emballages pour batteries sont étiquetés conformément aux directives européennes 2006/66/EC, norme relative aux batteries et accumulateurs en usage et aux batteries et accumulateurs usés. Les directives déterminent la marche à suivre en vigueur dans l'Union Européenne pour le retour et le recyclage des batteries et accumulateurs usés. Cette étiquette est appliquée sur diverses batteries pour indiquer que la batterie ne doit pas être mise au rebut mais plutôt récupérée en fin de cycle de vie selon cette norme.

バッテリーあるいはバッテリー用のパッケージには、EU 諸国に対する廃電気電子機器指令 2006/66/EC のラベルが貼られています。この指令は、バッテリーと蓄電池、および廃棄バッテリーと蓄電池に関するものです。この指令は、使用済みバッテリーと蓄電池の回収とリサイクルの骨子を定めているもので、EU 諸国にわたって適用されます。このラベルは、使用済みになったときに指令に従って適正な処理をする必要があることを知らせるために種々のバッテリーに貼られています。

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury, and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and treatment of batteries and accumulators. Customer

participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local IBM representative.

This notice is provided in accordance with Royal Decree 106/2008 of Spain: The retail price of batteries, accumulators, and power cells includes the cost of the environmental management of their waste.

For California:

Perchlorate material – special handling may apply. See <http://www.dtsc.ca.gov/hazardouswaste/perchlorate/>.

The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials. This product/part may include a lithium manganese dioxide battery which contains a perchlorate substance.

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

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