

xSeries 236 Type 8841



# Hardware Maintenance Manual and Troubleshooting Guide



xSeries 236 Type 8841



# Hardware Maintenance Manual and Troubleshooting Guide

**Note**

- Before using this information and the product it supports, read Appendix B, "Safety information," on page 151 and Appendix C, "Notices," on page 185.
- **The most recent version of this document is available on the World Wide Web at <http://www.ibm.com/pc/support/>.**

**Ninth Edition (April 2006)**

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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® 236 Type 8841 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 8841," on page 141, 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 151.

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## 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.**

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## 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/pc/us/compat/>.

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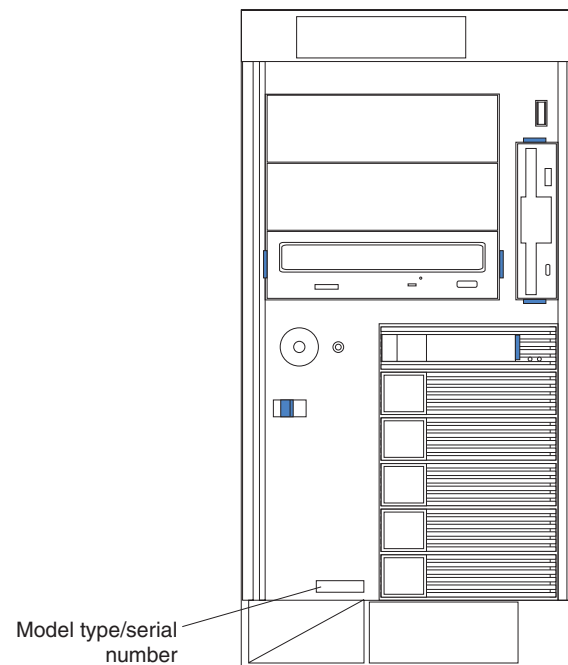
## Chapter 1. General information

This *Hardware Maintenance Manual and Troubleshooting Guide* contains information about servicing the IBM xSeries 236 Type 8841 server.

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

The model number and serial number are on labels on the bottom of the server and on the front, visible through the bezel, as shown in the following illustration.

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



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## Related documentation

This *Hardware Maintenance Manual and Troubleshooting Guide* is provided in Portable Document Format (PDF). It contains information to help a user solve problems or to provide helpful information to a service technician. The following documents also come with the server:

- *User's Guide*

This document is in PDF on the IBM *xSeries® Documentation CD*. It 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 information that customers can use to install options in the server.

- *Safety Information*

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

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

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/>.

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## Notices and statements used in this document

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

The following notices and statements are used in this document:

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



## Features and specifications

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

Table 1. Features and specifications

<p><b>Microprocessor:</b></p> <ul style="list-style-type: none"> <li>• Intel® Xeon™, 2.8 GHz or higher depending on server model</li> <li>• 1 MB Level-2 cache</li> <li>• 800 MHz front-side bus (FSB)</li> <li>• Support for up to two microprocessors</li> </ul> <p><b>Note:</b> Use the Configuration/Setup Utility program to determine the type and speed of the microprocessor.</p> <p><b>Memory:</b></p> <ul style="list-style-type: none"> <li>• Standard: 512 MB, or 1 GB depending on server model, expandable to 16 GB</li> <li>• Type: 400 MHz, registered, ECC, PC2-3200 double data rate II, SDRAM</li> <li>• Sizes: 256 MB, 512 MB, 1 GB, or 2 GB (when available) in pairs</li> <li>• Connectors: two-way interleaved, eight dual inline memory module (DIMM) connectors</li> <li>• Maximum: Four pairs of single-ranked PC2-3200 DDRII DIMMs</li> </ul> <p><b>Drives standard:</b></p> <ul style="list-style-type: none"> <li>• Diskette: 1.44 MB</li> <li>• CD-ROM: IDE</li> </ul> <p><b>Expansion bays:</b></p> <ul style="list-style-type: none"> <li>• Six open hot-swap, slim-high, 3.5-inch drive bays</li> <li>• Three 5.25-inch bays (CD-ROM drive installed in one bay)</li> <li>• One 3.5-inch removable-media drive bay (diskette drive installed)</li> </ul> <p><b>PCI expansion slots:</b></p> <ul style="list-style-type: none"> <li>• One Active PCI-X™ (hot-plug) 133 MHz/64-bit</li> <li>• Two PCI-X non-hot-plug 100 MHz/64-bit</li> <li>• Two PCI Express x4 non-hot-plug</li> <li>• One PCI non-hot-plug 33 MHz/32-bit</li> </ul> <p><b>Upgradeable microcode:</b> BIOS, diagnostics, and IBM integrated system management upgrades (when available) can update EEPROMs on the system board</p>	<p><b>Predictive Failure Analysis® (PFA) alerts:</b></p> <ul style="list-style-type: none"> <li>• Power supplies</li> <li>• Fans</li> <li>• Memory</li> <li>• Hard disk drives</li> <li>• Microprocessors</li> <li>• Voltage regulator modules (VRMs)</li> </ul> <p><b>Integrated functions:</b></p> <ul style="list-style-type: none"> <li>• Baseboard management controller <ul style="list-style-type: none"> <li>– Service processor with light path diagnostics</li> <li>– RS-485 (ASM interconnect)</li> <li>– RJ-45 (Ethernet 10/100 ASM interconnect)</li> <li>– Support for IBM Remote Supervisor Adapter II SlimLine</li> </ul> </li> <li>• Dual Broadcom 5721 10/100/1000 Ethernet controllers (dual stacked RJ-45 connectors)</li> <li>• Two serial connectors</li> <li>• One parallel connector</li> <li>• Support for one external and one optional external or internal Ultra320 SCSI connector (dual-channel SCSI controller with RAID capabilities)</li> <li>• Three Universal Serial Bus (USB) v1.1 or v2.0 connectors (one on the front and two on the rear of the enclosure)</li> <li>• Keyboard connector</li> <li>• Mouse connector</li> <li>• ATI Radeon RV7000-M video <ul style="list-style-type: none"> <li>– Compatible with SVGA</li> <li>– 16 MB video memory</li> </ul> </li> </ul> <p><b>Note:</b> The baseboard management controller is also known as the service processor.</p> <p><b>Security features:</b></p> <ul style="list-style-type: none"> <li>• Door lock</li> <li>• Power-on and administrator passwords</li> <li>• Remote-control security settings</li> <li>• Selectable drive startup</li> <li>• Keyboard password</li> <li>• System-management security <ul style="list-style-type: none"> <li>– User login password</li> <li>– Read-only or read/write access</li> <li>– Dial-in call-back</li> </ul> </li> </ul> <p><b>Power supplies:</b></p> <ul style="list-style-type: none"> <li>• Standard: One 670 watts (115-230 V ac)</li> <li>• Upgradeable to two hot-swap power supplies</li> </ul>	<p><b>Acoustical noise emissions:</b></p> <ul style="list-style-type: none"> <li>• Without redundant fans installed <ul style="list-style-type: none"> <li>– Sound power, idle: 5.8 bel</li> <li>– Sound power, operating: 5.8 bel</li> <li>– Bystander sound pressure, idle: 43 dBa</li> <li>– Bystander sound pressure, operating: 43 dBa</li> </ul> </li> <li>• With optional redundant fans installed <ul style="list-style-type: none"> <li>– Sound power, idle: 6.1 bel</li> <li>– Sound power, operating: 6.1 bel</li> <li>– Bystander sound pressure, idle: 46 dBa</li> <li>– Bystander sound pressure, operating: 46 dBa</li> </ul> </li> </ul> <p><b>Electrical input:</b></p> <ul style="list-style-type: none"> <li>• Sine-wave input (50-60 Hz) required</li> <li>• Input voltage range automatically selected</li> <li>• Input voltage low range: <ul style="list-style-type: none"> <li>– Minimum: 100 V ac</li> <li>– Maximum: 127 V ac</li> </ul> </li> <li>• Input voltage high range: <ul style="list-style-type: none"> <li>– Minimum: 200 V ac</li> <li>– Maximum: 240 V ac</li> </ul> </li> <li>• Input kilovolt-amperes (kVA) approximately: <ul style="list-style-type: none"> <li>– Minimum: 0.1 kVA</li> <li>– Maximum: 0.8 kVA</li> </ul> </li> </ul> <p><b>Heat output:</b> Approximate heat output in British thermal units (Btu) per hour</p> <ul style="list-style-type: none"> <li>• Minimum configuration: 341 Btu (100 watts/hour)</li> <li>• Maximum configuration: 2600 Btu (760 watts/hour)</li> </ul> <p><b>Environment:</b></p> <ul style="list-style-type: none"> <li>• Air temperature: <ul style="list-style-type: none"> <li>– Server on: 10° to 35°C (50° to 95°F)</li> <li>– Altitude: 0 to 2134 m (7000 ft)</li> <li>– Server off: -40° to +60°C (-40° to 140°F)</li> <li>– Maximum altitude: 2133 m (7000 ft)</li> </ul> </li> <li>• Humidity: <ul style="list-style-type: none"> <li>– Server on: 8% to 80%</li> <li>– Server off: 8% to 80%</li> </ul> </li> </ul> <p><b>Size:</b></p> <ul style="list-style-type: none"> <li>• Height: 440 mm (17.3 in.)</li> <li>• Depth: 700 mm (27.5 in.)</li> <li>• Width: 221 mm (8.7 in.)</li> <li>• Weight: 33.5 kg (74 lb) to 45.8 kg (101 lb) depending upon configuration</li> </ul>
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## Server controls, LEDs, and power

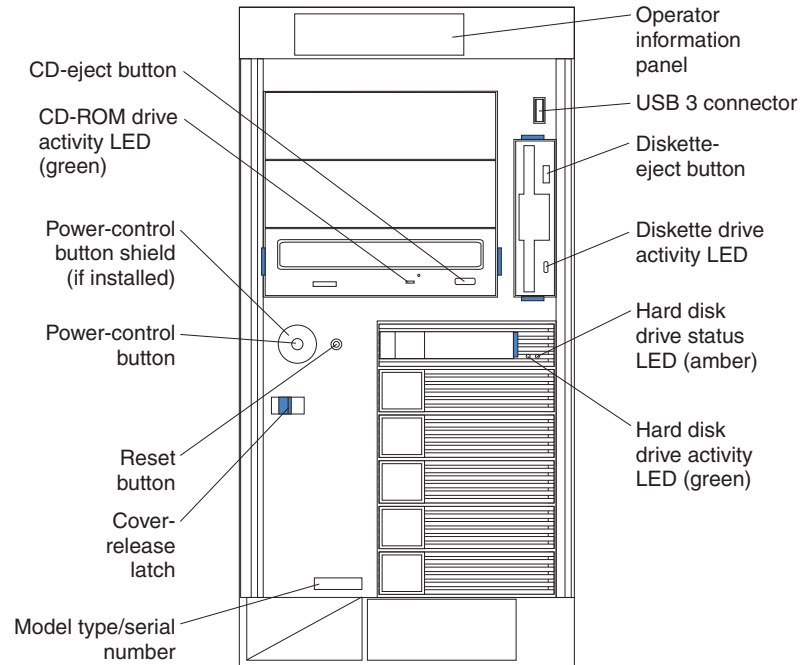
This section describes the controls and light-emitting diodes (LEDs) and how to turn the server on and off.

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

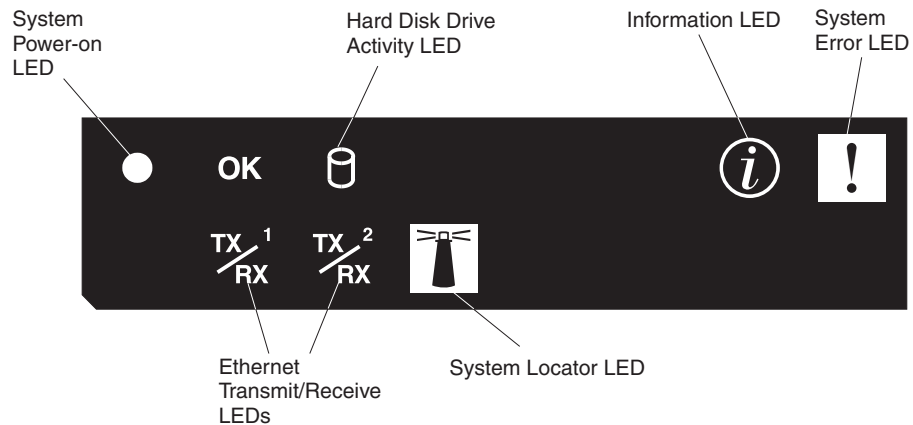
## Front view

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

**Note:** The front bezel door is not shown so that the drive bays are visible.



**Operator information panel:** This panel contains LEDs. The following illustration shows the LEDs on the operator information panel.



The following LEDs are on the operator information panel:

- **System power-on LED:** When this LED is lit and not flashing, it indicates that the server is turned on. When this LED is flashing, it indicates that the server is turned off and still connected to an ac power source. When this LED is off, it indicates that ac power is not present, or the power supply or the LED itself has failed. A power LED is also on the rear of the server.
- **OK LED:** This green LED is lit only when the Front Panel LED test is performed by the Enhanced Diagnostics.
- **Hard disk drive activity LED:** When this green LED is flashing rapidly it indicates that there is activity on a hard disk drive.
- **System-information LED:** When this amber LED is on, the server power supplies are nonredundant, or some other noncritical event has occurred. The event is recorded in the error log. Check the light path diagnostic panel for more information (see the “Light path diagnostics” on page 17).
- **System-error LED:** When this amber LED is lit it indicates that a system error has occurred. Use the diagnostic LED panel and the system service label on the inside of the left-side cover to further isolate the error. See “Light path diagnostics” on page 17 for additional information.
- **System locator LED:** Use this LED to visually locate the server among other servers. You can use IBM Director to light this LED remotely.
- **Ethernet transmit/receive activity LED (Tx/Rx 1 or Tx/Rx 2):** When these two green LEDs are lit they indicate that there is activity between the server and the network.

**USB 3 connector:** Connect a USB device to this connector.

**Diskette-eject button:** Press this button to release a diskette from the diskette drive.

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

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

**Hard disk drive status LED:** When this LED is lit, it indicates that the associated hard disk drive has failed. If an optional RAID adapter is installed in the server and the LED flashes slowly (one flash per second), the drive is being rebuilt. If the LED flashes rapidly (three flashes per second), the controller is identifying the drive.

**Reset button:** Press this button to reset the server and run the power-on self-test (POST). You might have to use a pen or the end of a straightened paper clip to press the button.

**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.

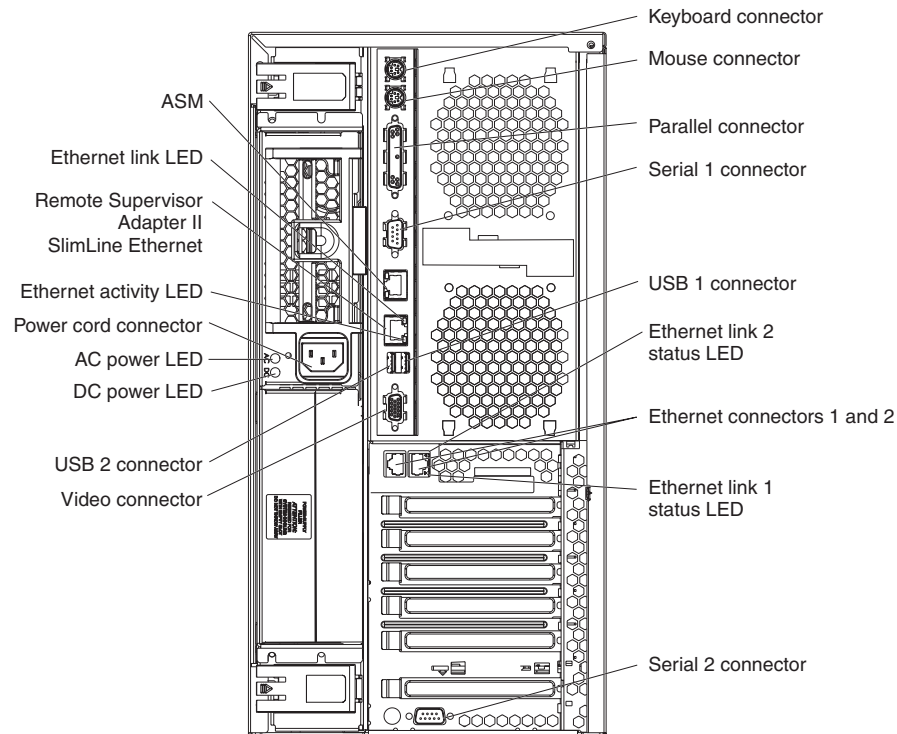
**Power-control-button shield:** You can install this circular disk over the power-control button to prevent the server from being turned off accidentally.

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

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

## Rear view

The following illustration shows the connectors and LEDs on the rear of the server.



**Keyboard connector:** Connect a PS/2 keyboard to this connector.

**Mouse connector:** Connect a mouse or other PS/2 device to this connector.

**Parallel connector:** Connect a parallel device to this connector.

**Serial 1 connector:** Connect a 9-pin serial device to this connector.

**USB 1 connector:** Connect a USB device to this connector.

**Ethernet link 1 status LED:** This LED is on the Ethernet connector. When this LED is lit, there is an active connection on the Ethernet port 1.

**Ethernet connectors 1 and 2:** Use these connectors to connect the server to a network.

**Ethernet link 2 status LED:** This LED is on the Ethernet connector. When this LED is lit, there is an active connection on the Ethernet port 2.

**Serial 2 connector:** Connect a 9-pin serial device to this connector.

**Video connector:** Connect a monitor to this connector.

**USB 2 connector:** Connect a USB device to this connector.

**DC power LED:** This green LED provides status information about the power supply. During typical operation, both the ac and dc power LEDs are lit. For any other combination of LEDs, see “Light path diagnostics” on page 17.

**AC power LED:** This green LED provides status information about the power supply. During typical operation, both the ac and dc power LEDs are lit. For any other combination of LEDs, see “Light path diagnostics” on page 17.

**Power-cord connector:** Connect the power cord to this connector.

**Ethernet Activity LED:** This LED is on the Ethernet connector. When it flashes, it indicates that data is being transmitted or received between the server and the network device that is connected to the connector. The flashing frequency is proportional to the amount of traffic on the network link.

**ASM:** Use this connector to connect the server to an Advanced System Management (ASM) network.

**Ethernet link status LED:** This LED is on the Ethernet connector. When this LED is lit, there is an active connection on the Ethernet port.

**Remote Supervisor Adapter II SlimLine Ethernet:** Use this connector to connect the server to an optional Remote Supervisor Adapter II SlimLine installed in another server. This connector is enabled when the Remote Supervisor II SlimLine option is installed.

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## Server power features

When the server is connected to an ac power source but is not turned on, the operating system does not run, and all core logic except for the service processor is shut down; however, the server can respond to requests from the service processor (also called the baseboard management controller), 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 is not turned on.

## Turning on the server

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

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

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

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

## Turning off the server

When you turn off the server and leave it connected to ac power, the server can respond to requests from the service processor, such as a remote request to turn on the server. While the server remains connected to ac power, one or more fans might continue to run. To remove all power from the server, you must disconnect it from the power source.

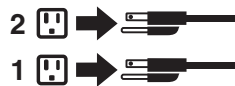
Some operating systems require an orderly shutdown before you turn off the server. See the operating-system documentation for information about shutting down the operating system.

### 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 your operating system supports this feature. After an orderly shutdown of the operating system, the server will be turned off automatically.
- You can press the power-control button to start an orderly shutdown of the operating system and turn off the server, if your operating system supports this feature.
- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the server.
- If the server is connected to an Advanced System Management interconnect network that contains at least one server with an optional Remote Supervisor Adapter installed, the server can be turned off from the Remote Supervisor Adapter user interface.
- If an optional Remote Supervisor Adapter is installed in the server, the server can be turned off from the Remote Supervisor Adapter user interface.
- If the Wake on LAN feature turned on the server, the Wake on LAN feature can turn off the server.
- The integrated system management processor can turn off the server as an automatic response to a critical system failure.
- You can turn off the server through a request from the service processor.

---

## Chapter 2. Configuration

Detailed information about configuring the server is in the IBM xSeries *User's Guide* on the IBM *Documentation CD*.

The latest information about these programs and the most recent device-driver files are available at <http://www.ibm.com/support/>.

The following configuration programs and capabilities come with the server:

- Configuration/Setup Utility program
- Baseboard management controller utility programs
- SCSISelect Utility program for Adaptec® HostRAID™ configuration
- Preboot Execution Environment (PXE) boot agent utility program

---

### Starting the Configuration/Setup Utility program

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.

**Note:** If you have set both levels of passwords (power-on and administrator), you must type the administrator password to access the full Configuration/Setup Utility menu. Without the administrator password, limited Configuration/Setup Utility program functions are available.

3. Follow the instructions that appear on the screen.





---

## Chapter 3. 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 149 for more information.

---

### General checkout

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

- Read Appendix B, “Safety information,” on page 151.
- The server diagnostic programs are stored in electrically erasable programmable read-only memory (EEPROM) on the system board that is shared with the BIOS code. 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 15) 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 no beep or more than one beep sounds, see “Beep symptoms” on page 104 or “No-beep symptoms” on page 107.
  4. If the server is suspended and a POST error code is displayed, see “POST error codes” on page 107.
  5. If the server is suspended and no error message is displayed, see “Error symptoms” on page 121 and “Undetermined problems” on page 138.

6. For information about power-supply problems, see “Power checkout” on page 24.
7. For intermittent problems, check the error logs; see “Diagnostic programs, error codes and messages” on page 15.

---

## 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. Turn off the server and all external devices.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Turn on all external devices.
5. Turn on the server.
6. Record any beep codes that sound or POST error messages that are displayed on the screen. If no beep or more than one beep sounds, look up the error in “Beep symptoms” on page 104 or “No-beep symptoms” on page 107; if an error is displayed, look up the first error in “POST error codes” on page 107.
7. Check the operator information panel system-error LED; if it is on, see “Light path diagnostics” on page 17.
8. Check the system-error log and the BMC log.

**Note:** The system-error log 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 103.

9. Start the diagnostic programs.
10. 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 103.

**YES.** Run the diagnostic programs (see “Diagnostic programs, error codes and messages” on page 15).

If you receive an error, see Chapter 6, “Symptom-to-FRU index,” on page 103.

If the diagnostic programs were completed successfully and you still suspect a problem, see “Undetermined problems” on page 138.

---

## 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” on page 14).

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 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 15).

- **ServerGuide error symptoms**

ServerGuide™ error symptoms are described at “ServerGuide error symptoms” on page 129.

- **SCSI error messages**

For information on SCSI errors, see “Small computer system interface messages” on page 21 and “SCSI error codes” on page 130

- **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 17).

- **Error symptom tables**

These tables list problem symptoms, along with suggested steps to correct the problems (see the “Error symptoms” on page 121).

---

## 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 104 and “POST error codes” on page 107).

**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 is available only with the Remote Supervisor Adapter II SlimLine.

## Viewing error logs from the Configuration/Setup Utility program

To view the POST error log, the system-error log, or the BMC log from the Configuration/Setup Utility program, start the Configuration/Setup Utility program (see “Starting the Configuration/Setup Utility program” on page 9) and make the appropriate choices:

- To view the POST error log or the system-error log, 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 error logs from the diagnostic programs

To view the diagnostic test log, see “Starting the diagnostic programs” on page 16.

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

1. Start the diagnostic programs (see “Starting the diagnostic programs” on page 16).
2. Select **Hardware Info** from the top of the diagnostic programs screen.
3. Select **System Error Log** from the list that appears; then, follow the instructions on the screen.

---

## Diagnostic programs, error codes and messages

The server diagnostic programs are stored in electrically erasable programmable read-only memory (EEPROM) on the system board that is shared with the BIOS code. These programs are the primary method of testing the major components of your 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 115.

### 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.

### Viewing the system-error log

You can also view the system-error log from the diagnostic programs. See the instructions in “Viewing error logs from the diagnostic programs” on page 14.

**Note:** The system-error log on the xSeries 236 is available only with the Remote Supervisor Adapter II SlimLine.

For descriptions of the error messages that might appear when you run the diagnostic programs, see “Diagnostic error codes” on page 115.

---

## Light path diagnostics

The server’s light path diagnostics feature provides a path that can be followed in distinct 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.

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, LEDs, and power” on page 3). If the system-error light is lit, one or more lights inside the server might also be lit that can direct you to the source of the error.

The system information LED lights to alert you that there might be important information recorded in the system-error log.

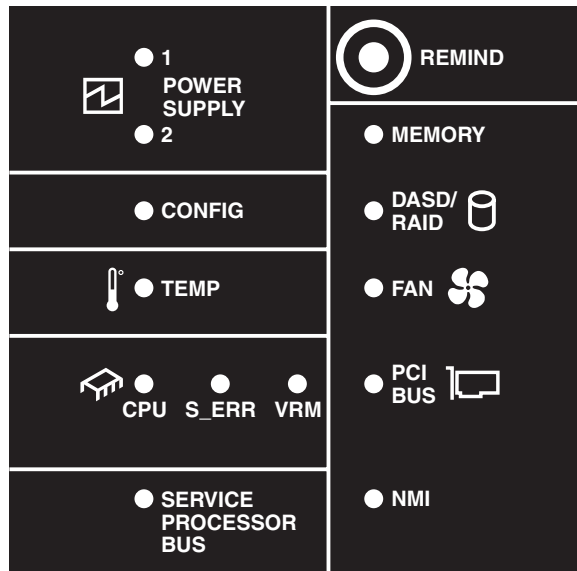
Complete the following steps to view the LEDs.

**Note:** Read Appendix B, “Safety information,” on page 151 and “Installation guidelines” on page 27.

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.

**Note:** Read “Working inside the server with the power on” on page 28 before removing the left-side cover while the server is connected to a power source.

2. Check the light path diagnostics panel by removing the left-side cover. These LEDs indicate the type of error that has occurred and are described in more detail at “Light path diagnostic errors” on page 113.



- 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, fans, and hard disk drives are located on or near the individual component.
- Some error conditions are corrected by taking an action not related to one particular component; see step 5.

- If the lit LED on the light path diagnostics panel refers to a specific internal component as indicated in step 3, look on the system board for lit error LEDs (see “System-board LEDs” on page 99). For example, a microprocessor error will light the LED next to the failing microprocessor.

The error LEDs on the system board will only be lit when there is power to the server. To view them, read “Working inside the server with the power on” on page 28; then, remove the cover and look for any lit error LEDs.

If the lit LED on the light path diagnostics panel does not refer to a specific internal component, continue with step 5.

- Go to the table at “Light path diagnostic errors” on page 113 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.

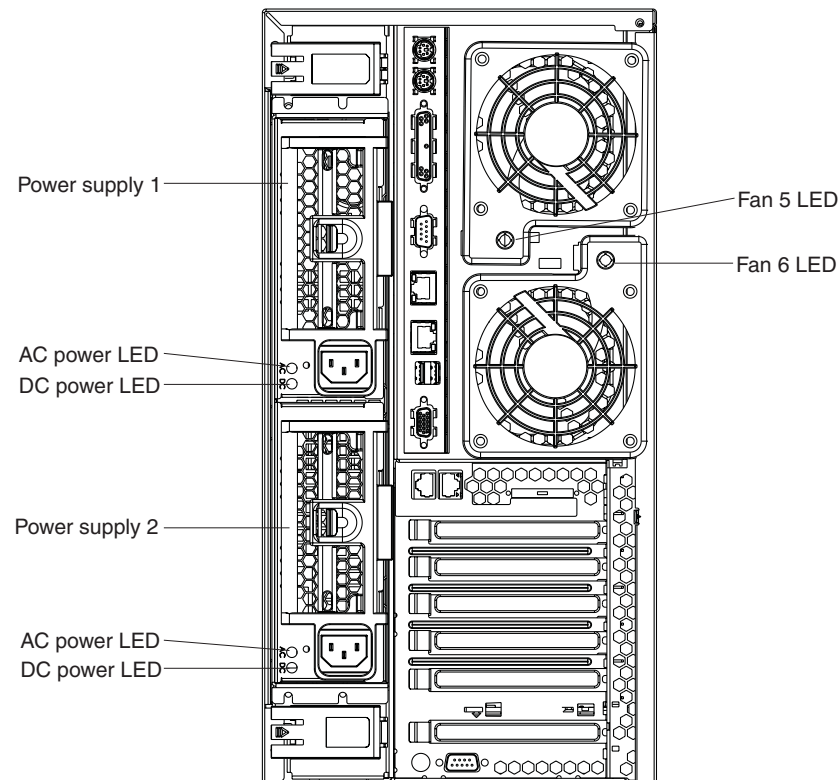


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## Power-supply LEDs

The ac and dc power LEDs on a power supply provide status information about that power supply. The following illustration shows the location of the ac and dc power LEDs.

**Note:** The following illustration shows the rear of the server with two hot-swap power supplies installed. A server with a single fixed power supply will have one power supply and no fans on the rear of the server.



For more information about the ac and dc power LEDs, see “Power-supply LED errors” on page 115.

---

## Updating the BMC firmware

Use the baseboard management controller (BMC) firmware update utility program to download a BMC firmware update or a sensor data record/field replaceable unit 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.

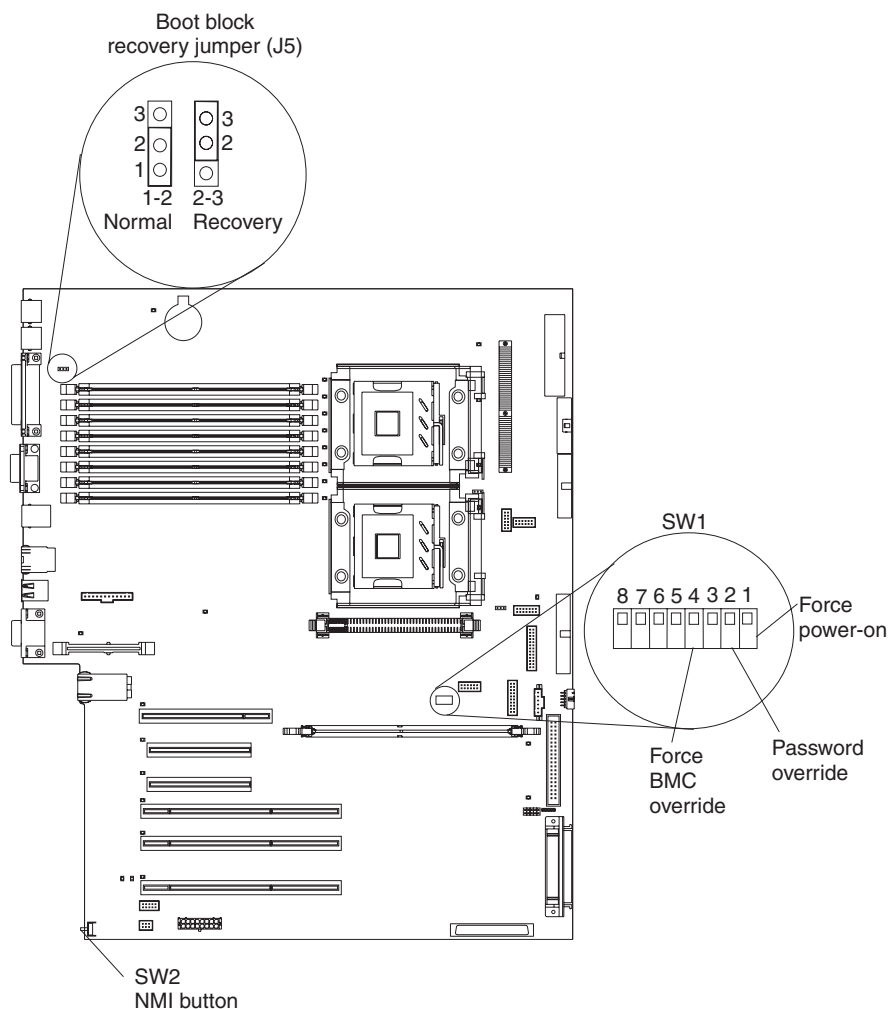
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## Resetting the BMC firmware

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 (H8) on the system board is not on, you will need to reset the BMC firmware. (See “System-board LEDs” on page 99 for the location of the heartbeat LED.)

Complete the following steps to reset the BMC firmware:

1. Read Appendix B, “Safety information,” on page 151 and “Handling static-sensitive devices” on page 28.
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 left-side cover” on page 30).



5. Locate the force BMC override switch (switch 4 of SW1) on the system board, removing any components that impede access to the switch.
6. Move switch 4 of SW1 to the ON position.
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 19).

When the update is complete, return switch 4 of SW1 to the OFF position.

---

## Small computer system interface messages

If you receive a SCSI error message, see “SCSI error codes” on page 130.

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

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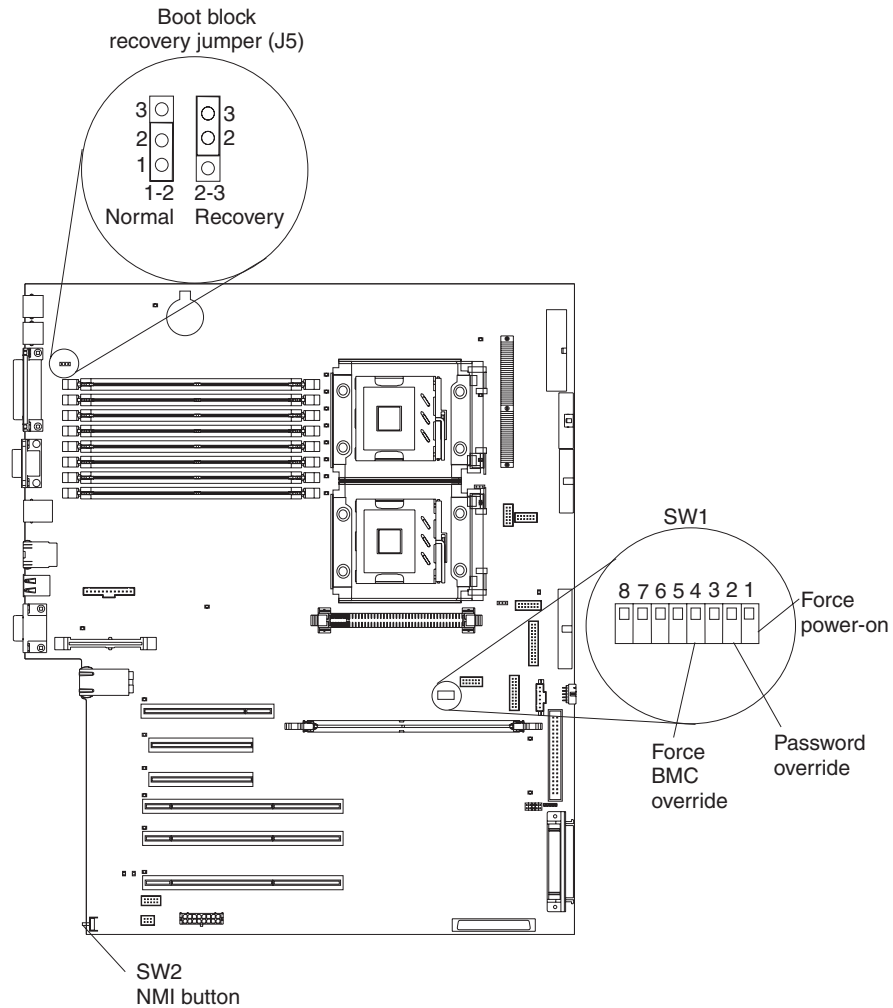
## Recovering the BIOS code

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 151 and “Handling static-sensitive devices” on page 28.
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 left-side cover” on page 30).
5. Locate the BIOS boot block jumper (J5) on the system board, removing any components that impede access to the jumper.



6. Remove the BIOS boot block 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.

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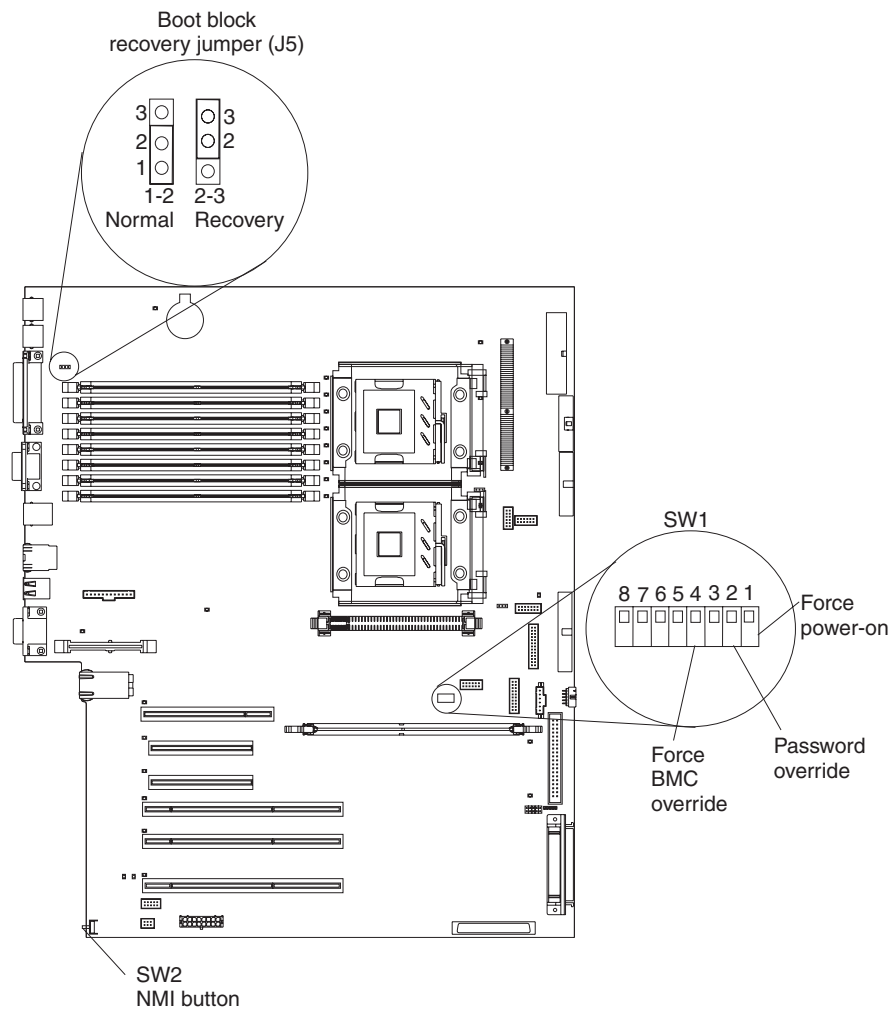
## Erasing a lost or forgotten password (clearing CMOS memory)

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 switch and erase a forgotten password, complete the following steps:

1. Read Appendix B, "Safety information," on page 151 and "Handling static-sensitive devices" on page 28.
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 left-side cover" on page 30).
5. Locate the password reset switch (position 2 of SW1) on the system board, removing any components that impede access to the switch.



6. Move the password override switch (switch 2) from its upward position to its lower position.
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, you must move the password reset switch back to its upward position.

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## 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*.

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## 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 138).
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 138). For specific problems, see "Power-supply LED errors" on page 115.

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## 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/switch supports auto-negotiation. If it does not, try configuring the integrated Ethernet controller manually to match the speed and duplex mode of the hub/switch.
- 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/switch:

- 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/switch 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/switch. If the LED is off, there might be a defective connector or cable or a problem with the hub/switch.
- 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"><li>• 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.</li></ul> <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"><li>• Make sure that you are using the most recent device driver that is available from the World Wide Web.</li><li>• Reseat or replace the adapter.</li></ul>

Description	FRU/action
The Ethernet link status LED does not work.	<ul style="list-style-type: none"> <li>• Make sure that the hub/switch is turned on.</li> <li>• Check all connections at the Ethernet controller and the hub/switch.</li> <li>• Use another port on the hub/switch.</li> <li>• If the hub/switch does not support auto-negotiation, manually configure the Ethernet controller to match the hub/switch.</li> <li>• If you manually configured the Duplex mode, make sure that you also manually configure the speed.</li> </ul>
The Ethernet transmit/receive activity LED does not work.	<ul style="list-style-type: none"> <li>• Make sure that you have installed the network device drivers.</li> <li>• The network might be idle. Try sending data from this server.</li> </ul>
Data is incorrect or sporadic.	<ul style="list-style-type: none"> <li>• Make sure that you are using Category 5 or higher cabling when operating the server at 100 Mbps or at 1000 Mbps.</li> <li>• Make sure that the cables do not run close to noise-inducing sources like fluorescent lights.</li> </ul>
The Ethernet controller stopped working when another adapter was added to the server.	<ul style="list-style-type: none"> <li>• Make sure that the cable is connected to the Ethernet controller.</li> <li>• Make sure that the PCI system BIOS code is current.</li> <li>• Reseat the adapter.</li> <li>• 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.</li> </ul> <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"> <li>• Reseat or replace the adapter.</li> </ul>
The Ethernet controller stopped working without apparent cause.	<ul style="list-style-type: none"> <li>• Try a different port on the hub/switch.</li> <li>• Reinstall the device drivers. See the operating-system documentation and the ServerGuide information.</li> </ul>

## 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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## Chapter 4. Installing options

This chapter provides detailed instructions for installing hardware options in the server.

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### Installation guidelines

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

- For a list of supported options for the server, go to <http://www.ibm.com/us/compat/>.
- Read the safety information beginning on page v and the guidelines in “Handling static-sensitive devices” on page 28. 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.
- Have a small flat-blade screwdriver available.
- You do not have to turn off the server to install or replace hot-swap power supplies, hot-swap fans, or hot-plug Universal Serial Bus (USB) devices.
- 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.
- When you need to access the inside of the server, you might find it easier to lay the server on its side.

### System reliability guidelines

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.
- 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 left-side cover before turning on the server. Operating the server for extended periods of time (more than 30 minutes) with the left-side 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.
- You have replaced a hot-swap drive within 2 minutes of removal.
- You do not remove the air baffle while the server is running. Operating the server without the air baffle might cause the microprocessor to overheat.
- Microprocessor socket 2 always contains either a microprocessor baffle or a microprocessor and heat sink.

## 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 allow your necktie or scarf to hang inside the server.
- Remove jewelry, such as bracelets, necklaces, rings, and loose-fitting wrist watches.
- Remove items from your shirt pocket, such as pens and pencils, that could fall into the server as you lean over it.
- Avoid dropping any metallic objects, such as paper clips, hairpins, and screws, into the server.

## Handling static-sensitive devices

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

To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

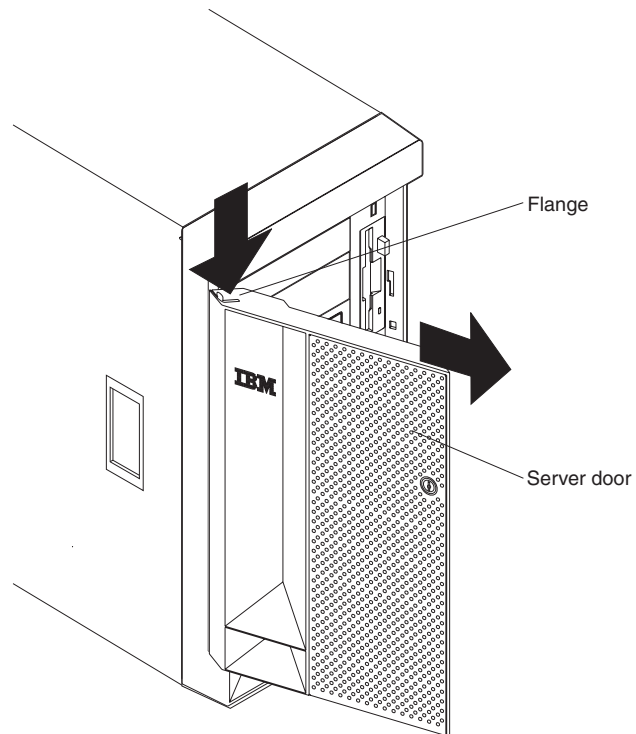
- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal part of the server for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the server without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on 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.

---

## Removing the server door

The following illustration shows how to remove the door from the server.

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



Complete the following steps to remove the server door:

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Unlock and open the server door.
3. Locate the flange on the top edge of the door.
4. Press the flange downward while pressing outward on the door; then, lift the door up and off the hinge. Set the door aside in a safe place.

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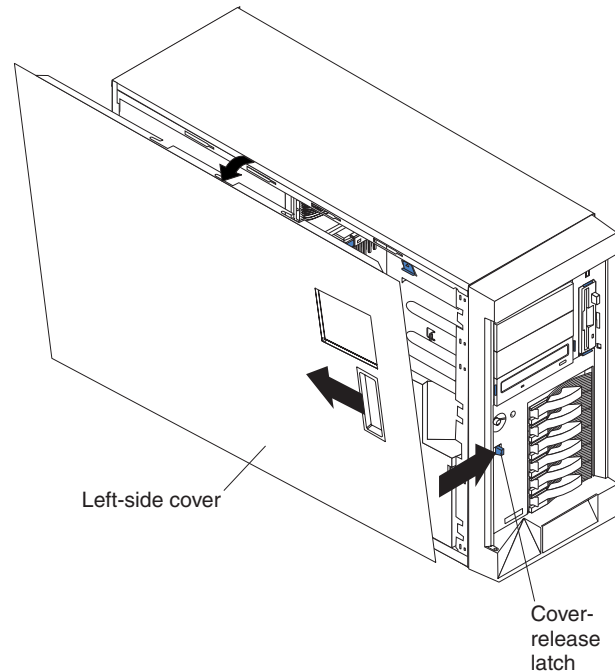
## Removing the server left-side cover air baffle and bezel

Before you remove the left-side cover, air-baffle, or bezel, read the safety information beginning on page v and “Installation guidelines” on page 27.

### Removing the left-side cover

The following illustration shows how to remove the left-side cover from the server.

**Note:** If you have not already removed the door, remove it as described in “Removing the server door” on page 29.



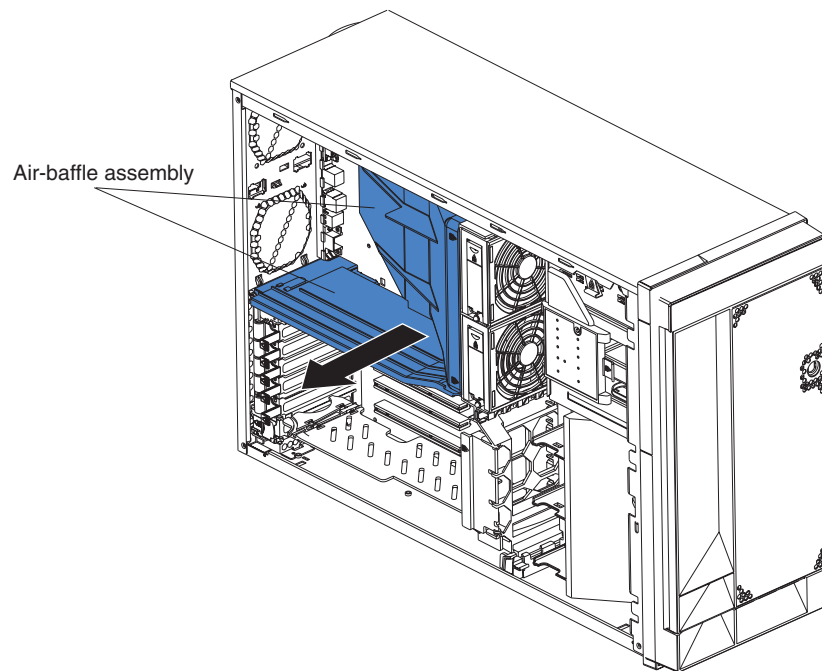
Complete the following steps to remove the server left-side cover:

1. Push the plastic cover-release latch near the edge of the side cover to the right to release the cover.
2. While pushing the plastic cover-release latch, slide the side cover slightly toward the rear of the server; the cover will stop after approximately 25 mm (1 inch). Lift the cover off the server and set the cover aside.

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

## Removing the air baffle

When working with some options, you must first remove the air baffle to access certain components or connectors on the system board. The following illustration shows how to remove the air baffle.



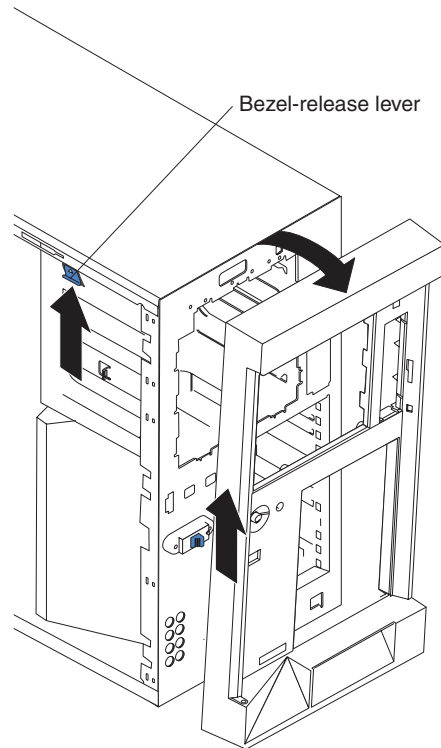
Complete the following steps to remove the air baffle:

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables (see “Turning on the server” on page 7); then, remove the cover (see “Removing the left-side cover” on page 30).
3. Place your fingers on each side of the air baffle.
4. Press in on the sides and lift the air baffle out of the server.

**Attention:** For proper cooling and airflow, replace the air baffle before turning on the server. Operating the server with the air baffle removed might damage server components.

## Removing the bezel

The following illustration shows how to remove the bezel from the server.



Complete the following steps to remove the bezel:

1. Remove the left-side cover and locate the bezel-release lever.
2. Press up on the bezel-release lever.
3. Pull the top of the bezel away from the chassis; then, lift the bezel to disengage the bottom tabs.
4. Remove the bezel from the server and store the bezel in a safe place.

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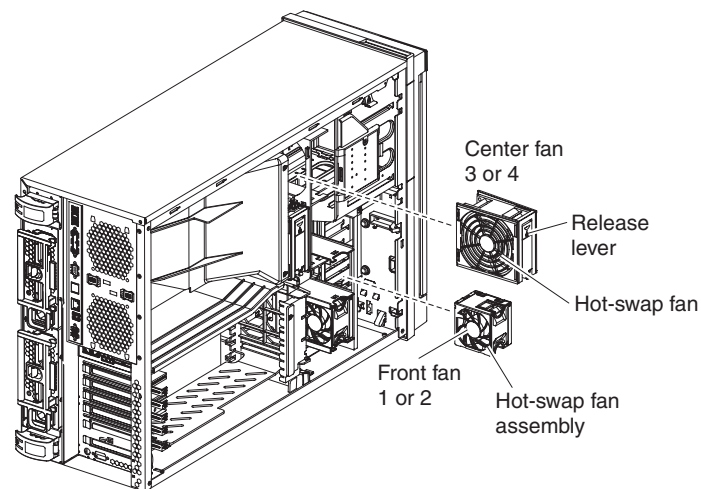
## Replacing hot-swap fans

The server comes with four hot-swap fans: two front fans (fans 1 and 2), and two center fans (fans 3 and 4). You do not have to turn off the power to the server to replace a hot-swap fan.

If the server is equipped with the IBM xSeries 670-Watt Hot-swap Power-Supply option, two rear fans (fans 5 and 6) must also be installed on the server. For information on replacing these fans or installing this option, see “Replacing a rear fan (5 or 6)” on page 36 or “Installing the 670-Watt hot-swap power-supply option” on page 37.

**Attention:** To help ensure proper cooling, if a fan fails, replace it within 48 hours.

The following illustration shows how to replace hot-swap fans.

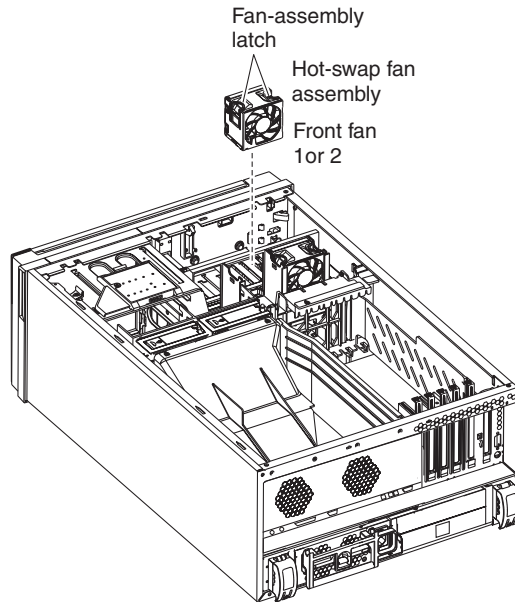


Determine which fan to replace by checking the LEDs on the fans. The front fans, center fans, and rear fans are installed differently from each other. This section contains separate instructions for each group of fans.

## Replacing a front fan (1 or 2)

Complete the following steps to replace fan 1 or 2:

**Attention:** To ensure proper server operation, if a fan fails, replace it within 48 hours.



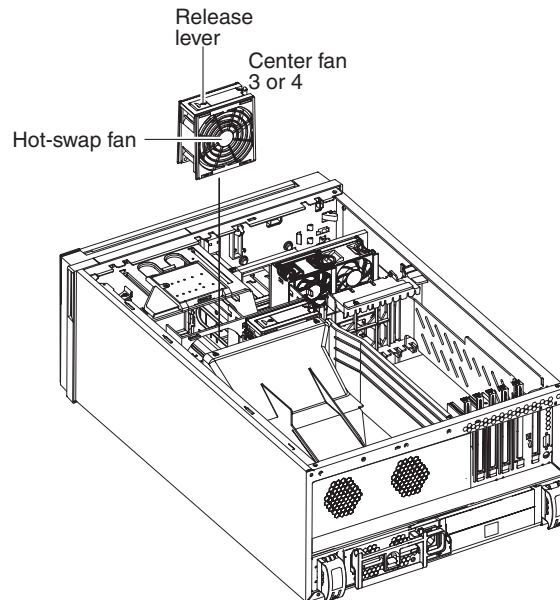
Complete the following steps to replace hot-swap-fan 1 or 2:

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Remove the cover. See “Removing the left-side cover” on page 30. The LED on the failing fan assembly will be lit.  
**Attention:** To ensure proper system cooling, do not remove the left-side cover for more than 30 minutes during this procedure.
3. Place your fingers into the fan-assembly latch on the top of the failing fan.
4. Squeeze the fan-assembly latch together and lift the fan out of the server.
5. Position the new fan so that the LED on the fan is closest to the front of the server.
6. Push the replacement fan assembly into the server until it clicks into place.
7. Make sure that the FAN LED on the diagnostic LED panel (see “Light path diagnostics panel” on page 100) is not lit. If the FAN LED is lit, reseal the fan.
8. Replace the cover. See “Installing the server bezel and left-side cover” on page 62.



## Replacing a center fan (3 or 4)

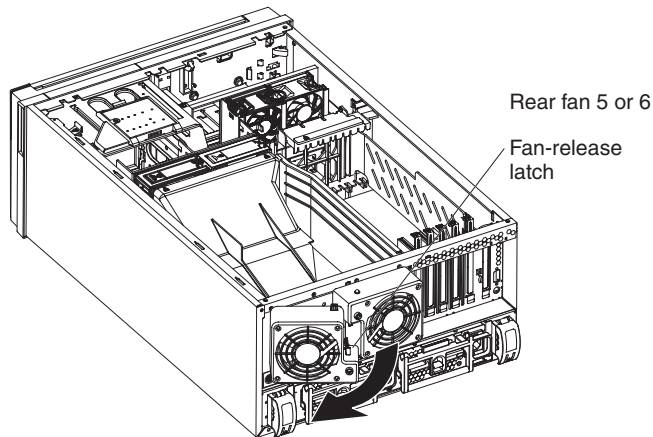
Complete the following steps to replace hot-swap fan 3 or 4:



1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Remove the cover. See “Removing the left-side cover” on page 30. The LED on the failing fan assembly will be lit.  
**Attention:** To ensure proper system cooling, do not remove the left-side cover for more than 30 minutes during this procedure.
3. Press the orange fan-release latch in the direction indicated by the arrow on the latch to open the release lever.
4. Pull the fan out of the server using the release lever.
5. Press the orange fan-release latch in the direction indicated by the arrow on the latch and open the release lever on the replacement fan.
6. Position the replacement fan so that the orange fan-release latch is away from you; then, slide the fan into the server. Press the release latch into place and secure the fan in the server.
7. Make sure that the FAN LED on the diagnostic LED panel (see “Light path diagnostics panel” on page 100) is not lit. If the FAN LED is lit, reseal the fan.
8. Reinstall the server cover. See “Installing the server bezel and left-side cover” on page 62.

## Replacing a rear fan (5 or 6)

Hot-swap fans 5 and 6 are included in the power-supply option. With these two additional hot-swap fans installed, the server supports the variable fan-speed control and redundant cooling features. For information on installing the option see “Installing the 670-Watt hot-swap power-supply option” on page 37.



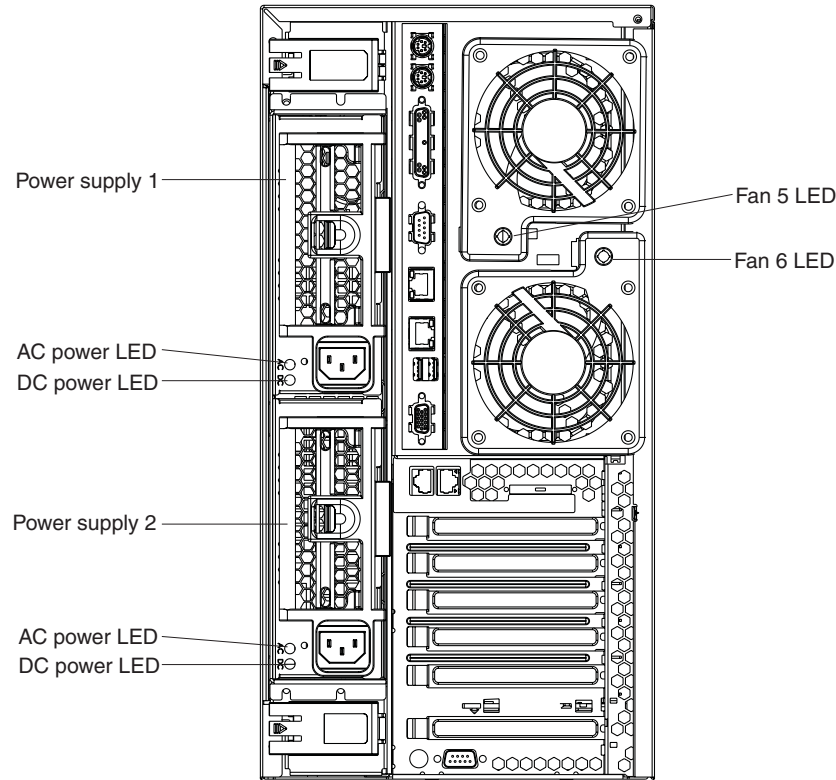
Complete the following steps to replace hot-swap-fans 5 and 6:

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Press in on the orange fan-release latch on the side of the fan; then, rotate the fan away from the server.
3. Pull the fan off the server.
4. Slide the two tabs of the replacement fan into the back of the server; then, rotate the fan toward the server until the fan-release latch clicks.
5. Make sure that the FAN LED on the diagnostic LED panel (see “Light path diagnostics panel” on page 100) is not lit. If the FAN LED is lit, reseal the fan.

---

## Installing the 670-Watt hot-swap power-supply option

The server comes with a power supply in the power supply 1 (PS1) position and a filler panel in the power supply 2 (PS2) position. You can install a 670-Watt hot-swap power-supply option, which includes a hot-swap power supply and two hot-swap fans.



Before you continue, review the following information:

- During normal nonredundant operation, a power supply must be installed in the power supply 1 position and a filler panel in the power supply 2 position.
- During normal redundant operation, a second hot-swap power supply and the two rear hot-swap fans must be installed in the server.

**Attention:** To help ensure proper cooling, if a fan fails, replace it within 48 hours.

- When the 670-Watt hot-swap power supply option is installed in the server, the addition of the two fans enables the redundant cooling feature. If any of the fans fail the other fans will speed up when needed to help keep the server cool and working properly.
- Two cable-restraint brackets are on the rear of the server. After you install the 670-Watt hot-swap power-supply option and connect the cables to the selected devices, you can use these cable-restraint brackets to manage the cable routing. Route the power cords through the power-cord restraint bracket. Route the remaining cables (for example, the cables that are connected to the I/O connectors) through the I/O cable-restraint bracket.

If you install or remove a power supply, observe the following precautions.

**Statement 8:**



**CAUTION:**

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

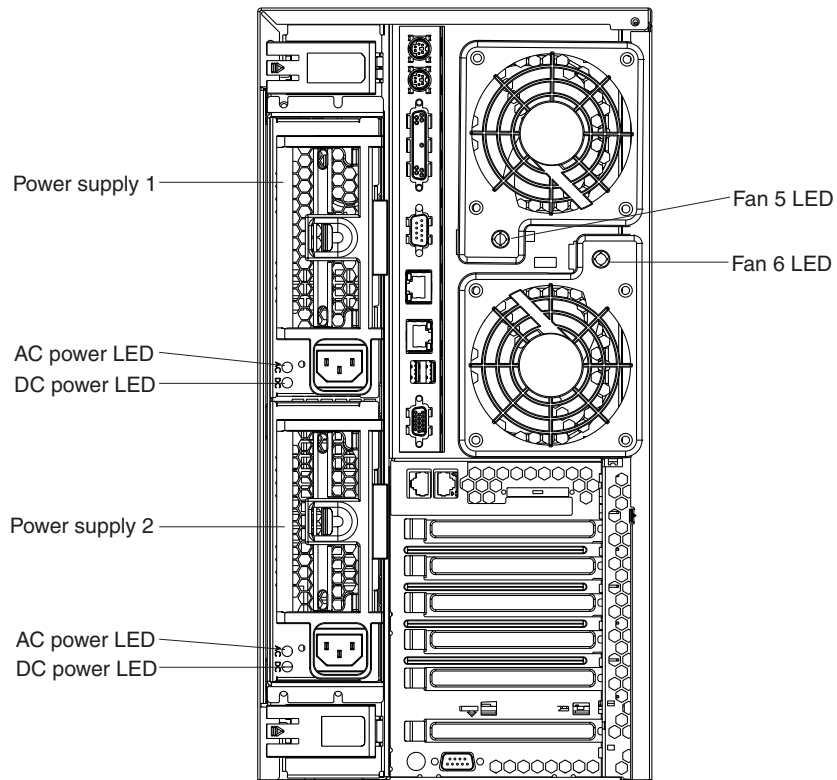


**Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.**

Complete the following steps to install the 670-Watt hot-swap power-supply option:

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Remove the filler panel from the power supply 2 opening.

3. Install the second hot-swap power-supply.



- a. Make sure that the handle on the power supply is in the open position.
  - b. Slide the power supply into the power supply 2 opening until it stops; then, push the handle down into the closed position.
4. Install the fans on the back of the server:
    - a. Position the first fan so that the notched area is facing up and the mounting surface is toward the server.
    - b. Tilt the bottom of the fan toward the server and insert the tabs into the corresponding holes.
    - c. Press in on the top half of the fan until it clicks into place.
    - d. Position the second fan so that the notched area is facing down and the mounting surface is toward the server.
    - e. Repeat steps 5b and 5c; then, continue to step 6.
  5. Connect one end of each power cord to the corresponding connector on each power supply; then, connect the other end of each power cord to a properly grounded electrical outlet.

**Note:** You can route the power cords through the power-cord restraint bracket on the rear of the server.

6. Make sure that the dc power LED and the ac power LED on each power supply is lit, indicating that the power supplies are operating properly.

## Replacing a hot-swap power supply

The server comes with one power supply.

If you install or remove a power supply, observe the following precautions.

### Statement 8:



### CAUTION:

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



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

Complete the following steps to remove and replace a hot-swap power supply:

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Disconnect the power cord from the power supply.
3. Push on the orange release latch in the center of the power-supply handle; then, pull out on the handle.
4. Extend the handle to the open position and pull the power supply out of the server.
5. Make sure that the handle on the new power supply is in the fully open position and slide it into the opening until it stops.
6. Push down on the handle until the release latch clicks.
7. Connect the power cord to the new power supply.
8. Make sure that the dc power LED and the ac power LED on the power supply is lit, indicating that the power supply is operating properly.

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## Installing or replacing an adapter

The following notes describe the types of adapters that the server supports and other information that 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 must change the switch or jumper settings on the adapter, follow the instructions that come with the adapter.
- Avoid touching the components and gold-edge connectors on the adapter.
- You can install full-length adapters and non-hot-plug adapters in slots 4 and 5.
- A full-length adapter cannot be installed in slot 1 if the ServeRAID-7k option is installed.
- The hot-plug slot (slot 6) supports full and half-length hot-plug and non-hot-plug adapters. The hot-plug feature is operating system dependant. See the documentation that comes with your operating system to see if it supports this feature.
- The 32-bit PCI slot (slot 1) supports 5.0 V and 3.3 V PCI adapters, with the exception that you cannot install a long adapter in slot 1 on servers with ServeRAID-7k installed.
- The 64-bit PCI-X slots 4 through 6 support 3.3 V signaling PCI or PCI-X adapters; they do not support 5.0 V signaling adapters.
- The PCI bus configuration is as follows:
  - Non-hot-plug, 33 MHz 32-bit PCI slot 1 is on PCI bus A.
  - Non-hot-plug, 64-bit PCI Express x4 slot 2 is on PCI bus B (independent of slots 1, 3, 4, 5, and 6).
  - Non-hot-plug, 64-bit PCI Express x4 slot 3 is on PCI bus C (independent of slots 1, 2, 4, 5, and 6).
  - Non-hot-plug, 100 MHz 64-bit PCI-X slots 4 and 5 and the integrated SCSI controller with RAID capabilities are on PCI bus D.
  - Hot-plug, 133 MHz 64-bit PCI-X slot 6 is on PCI bus F.

**Note:** If an optional ServeRAID controller is installed, it overrides the standard functionality of the integrated SCSI controller with RAID capabilities. The ServeRAID controller must be installed in its dedicated connector on the system board.

- The system scans PCI and PCI-X slots 1 through 6 to assign system resources. The system then starts (boots) the system devices in the following order, if you have not changed the default boot precedence: integrated Ethernet controller, integrated SCSI controller with RAID capabilities, and then PCI and PCI-X slots 1 through 6.

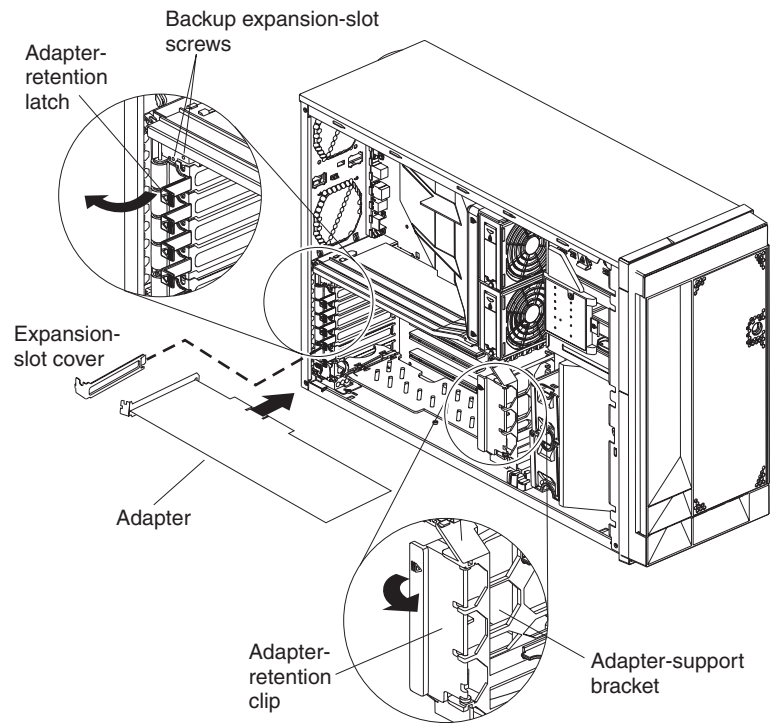
**Note:** To change the boot precedence for PCI and PCI-X devices, start the Configuration/Setup Utility program and select **Start Options** from the main menu. See the *User's Guide* on the IBM *xSeries Documentation* CD for details about using the Configuration/Setup Utility program.

- The server uses a rotational interrupt technique to configure PCI adapters so that you can install PCI adapters that do not support sharing of PCI interrupts.

Complete the following steps to install or replace an adapter:

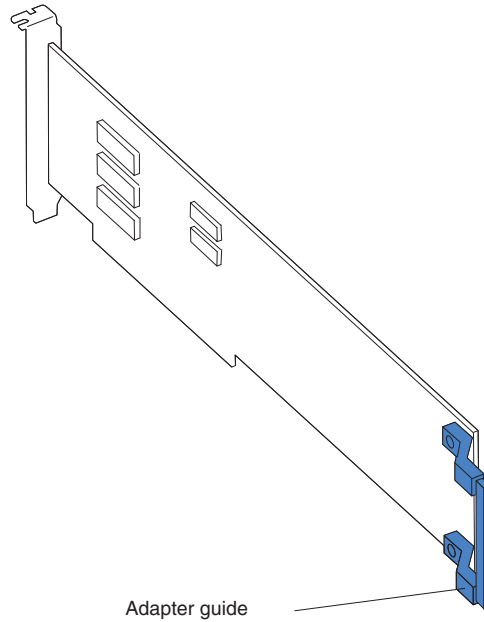
**Note:** If you are installing a hot-plug adapter go to “Installing or replacing a hot-plug adapter (slot 6)” on page 44.

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables. Remove the cover.
3. See the documentation that comes with the adapter for any cabling instructions and information about jumper or switch settings. (It might be easier for you to route cables before you install the adapter.)
4. Lift the adapter-retention latch and remove the expansion-slot cover.





5. If you are installing a full-length adapter, remove the blue adapter guide (if any) from the end of the adapter; then, lift the adapter-retention clip on the adapter-support bracket. Otherwise, continue with the next step.

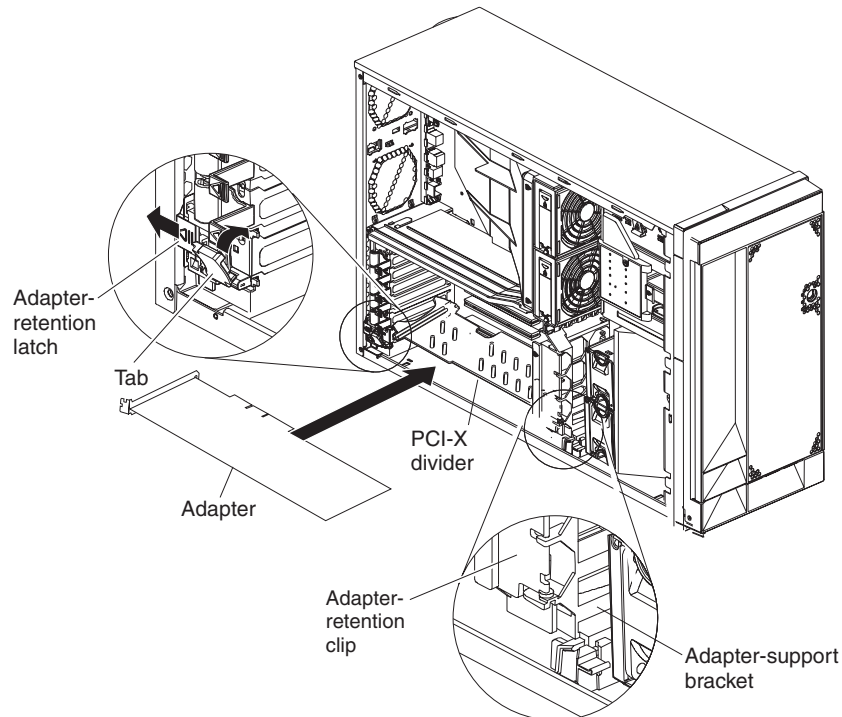


6. Press the adapter *firmly* into the expansion slot, lower the adapter-retention latch, and make sure that the latch is in the locked (closed) position.  
**Attention:** Incomplete insertion might cause damage to the system board or the adapter.
7. Connect any needed cables to the adapter.
8. If you have other options to install or remove, do so now.
9. Replace the cover. Go to “Completing the installation” on page 61.

## Installing or replacing a hot-plug adapter (slot 6)

You do not have to turn off the server to install hot-plug adapters in the hot-plug slots. However, you must turn off the server when performing any steps that involve installing or removing cables.

The following illustration shows how to install a PCI or PCI-X hot-plug adapter.

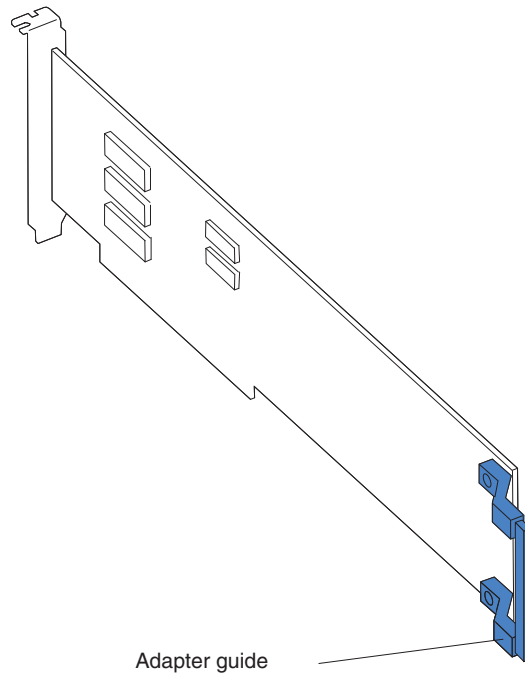


Complete the following steps to install or replace a hot-plug PCI or PCI-X adapter:

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Remove the cover.
3. Open the adapter-retention latch and remove the expansion-slot cover from the server.

**Attention:** Expansion slot covers must be installed on all empty slots. This maintains the electronic emissions characteristics of the server and ensures proper cooling of system components.

4. If you are installing a full-length adapter, lift the adapter-retention clip on the adapter-support bracket. Otherwise, continue with the next step.



5. See the documentation that comes with the adapter for any cabling instructions and information about jumper or switch settings.

**Attention:** Incomplete insertion might cause damage to the system board or the adapter.

6. Press the adapter *firmly* into the expansion slot.
7. Close the adapter-retention latch and, if necessary, the adapter-retention clip.

**Important:** Power cannot be provided to the adapter slot if the latch is not lowered into place.

8. Connect any needed cables to the adapter. You must turn the server off before installing any cables.

**Note:** See the documentation that comes with the operating system for information about enabling a hot-plug PCI-X slot.

9. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 61.

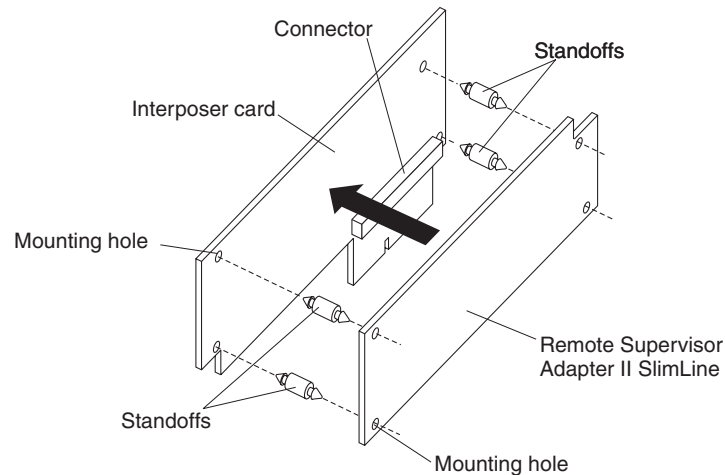
## Installing an IBM Remote Supervisor Adapter II SlimLine

This section provides instructions for installing an IBM Remote Supervisor Adapter II SlimLine. The optional IBM Remote Supervisor Adapter II SlimLine must be installed in its dedicated connector on the system board. See “System-board internal connectors” on page 94 for the location of the connector. The Remote Supervisor Adapter II SlimLine is not cabled to the system board.

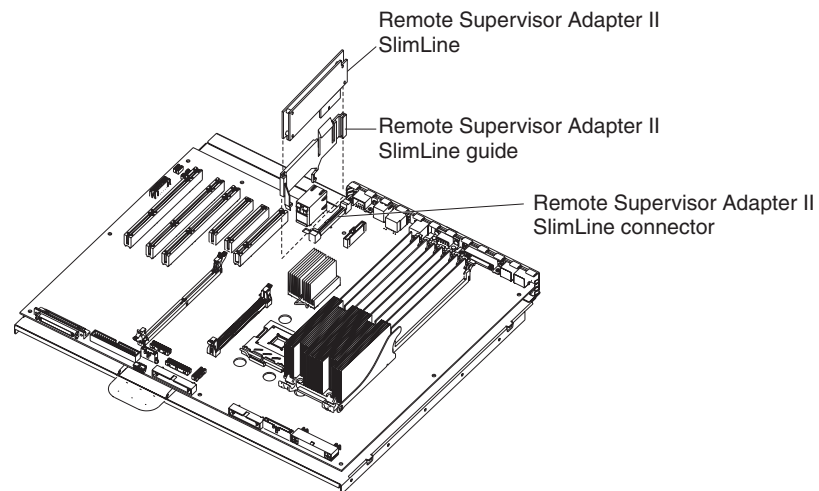
Complete the following steps to install the Remote Supervisor Adapter II SlimLine:

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables. Remove the cover and air baffle assembly.

3. Assemble the Remote Supervisor Adapter II SlimLine and Interposer card:



- a. Insert the standoffs that come with the option into the mounting holes in the Remote Supervisor Adapter II SlimLine.
  - b. Align the mounting holes in the Interposer card with the standoffs; then, align the connector on the card with the connector on the Remote Supervisor Adapter II SlimLine.
  - c. Press the Interposer card and Remote Supervisor Adapter II SlimLine together until fastened.
4. Press the Remote Supervisor Adapter II SlimLine Guide into place on the system board.



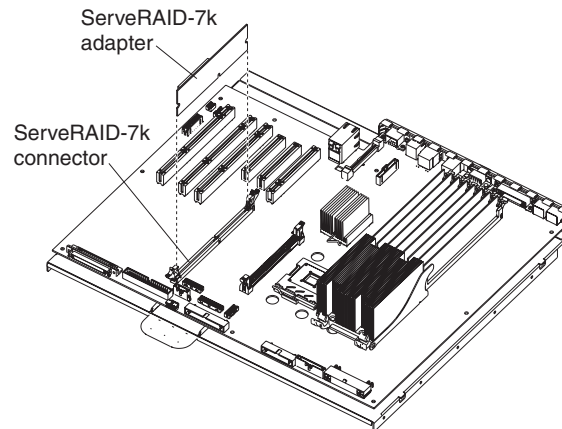
5. Position the entire assembly so that the edge connector on the Interposer card is at the rear of the server.
6. Carefully grasp the assembly by its top edge or upper corners, and align it with the Remote Supervisor Adapter II SlimLine Guide and the connector on the system board.  
**Attention:** Incomplete insertion might cause damage to the system board or the adapter.
7. Press the assembly firmly into the connector and under the retention latch on the Remote Supervisor Adapter II SlimLine Guide.

8. If you have other options to install or remove, do so now.
9. Replace the air-baffle assembly and cover. Go to “Completing the installation” on page 61.

## Installing the ServeRAID-7k adapter

The optional ServeRAID-7k adapter must be installed in its dedicated connector on the system board. See the following illustration for the location of the connector on the system board. The ServeRAID-7k adapter is not cabled to the system board and no rerouting of the SCSI cable is required.

Complete the following steps to install the ServeRAID-7k adapter:



1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables. Remove the cover and air baffle assembly.  
**Attention:** To avoid breaking the retaining clips or damaging the ServeRAID-7k adapter connector, open and close the clips gently.
3. Open the retaining clip on each end of the ServeRAID-7k adapter connector.
4. Touch the static-protective package containing the ServeRAID-7k adapter to any unpainted metal surface on the server. Then, remove the ServeRAID-7k adapter from the package.
5. Turn the ServeRAID-7k adapter so that the ServeRAID-7k adapter keys align correctly with the connector. The green battery pack of the ServeRAID-7k adapter should be facing away from the microprocessor sockets.  
**Attention:** Incomplete insertion might cause damage to the system board or the ServeRAID-7k adapter.
6. Press the ServeRAID-7k adapter firmly into the connector.
7. If you have other options to install or remove, do so now.
8. Replace the air-baffle assembly and cover. Go to “Completing the installation” on page 61.

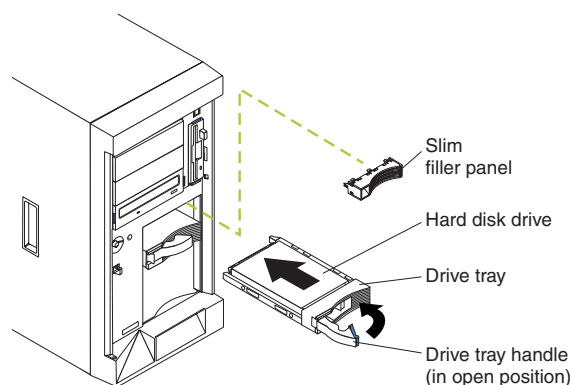
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## Installing a hot-swap hard disk drive

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 up to six 1-inch (26 mm) slim-high, 3.5-inch, hot-swap hard disk drives in the standard hot-swap bays.
- The hot-swap bays are arranged vertically in the standard hard disk drive cage; the bay numbers are 0 through 5 (from bottom to top).
- For a list of supported options for the server, go to <http://www.ibm.com/us/compat/>.
- Inspect the drive tray for signs of damage.
- Make sure that the drive is correctly installed in the tray.
- If the server has an optional RAID adapter, see the documentation that comes with the adapter for instructions on installing a hard disk drive.
- All hot-swap drives in the server should have the same throughput speed rating; mixing speed ratings might cause all drives to operate at the lower throughput speed.
- To minimize the possibility of damage to the hard disk drives when you are installing them in a rack configuration, install the server in the rack before installing the hard disk drives.
- You do not have to turn off the server to install hot-swap drives in the hot-swap drive bays. However, you must turn off the server when performing any steps that involve installing or removing cables.
- You can install three additional hot-swap hard disk drives in the server after you install the 3-Pack Ultra320 Hot-Swap Expansion option. These drives are in the optional hard disk drive cage. Connect the cable to J58 SCSI channel A on the system board. See the instructions that are provided with the option for installation instructions and additional information.
- Some filler panels come with a slim filler.
- The SCSI ID for each hot-swap hard disk drive is printed on the bezel.

The following illustration shows how to install a hot-swap hard disk drive.



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

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Remove the filler panel from one of the empty hot-swap bays.
3. Make sure that the tray handle is open; then, install the hard disk drive into the hot-swap bay.

**Notes:**

- a. When you turn on the server, check the hard disk drive status LEDs to verify that the hard disk drive is operating properly.  
If the amber hard disk drive status LED for a drive is lit continuously, that drive is faulty and must be replaced. If the green hard disk drive activity LED is flashing, the drive is being accessed.
- b. If the server will be configured for RAID operation using the integrated SCSI controller with RAID capabilities or an optional ServeRAID controller, you must configure the disk arrays before installing the operating system. See the ServeRAID documentation on the *IBM ServeRAID Support CD* for additional information about RAID operation and complete instructions for using ServeRAID Manager.

---

## Installing memory modules

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

- The server supports 400 MHz, 1.8 V, 240-pin, single-stacked, double-data-rate (DDR) II, registered synchronous dynamic random-access memory (SDRAM) with error correcting code (ECC) DIMMs. These DIMMs must be compatible with the latest PC3200 SDRAM Registered DIMM specification. For a list of supported options for the server, go to <http://www.ibm.com/us/compat/>.
- The server comes with a minimum of two 512 MB DIMMs, installed in slots 1 and 2. When you install additional DIMMs, be sure to install them in pairs. All the DIMMs in a single pair must be the same size and type. You can mix compatible DIMMs from various manufacturers.

Table 2. DIMM installation sequence

Pair	DIMM connectors	Pair	DIMM connectors
1	1 and 2	2	3 and 4
3	5 and 6	4	7 and 8

- The second pair does not have to contain DIMMs of the same size, speed, type, and technology as the first pair.
- The server supports Chipkill™ memory if all DIMMs are type x4 and larger than 512 MB. Using any 256 MB DIMMs, or any DIMM that is not of type x4, disables Chipkill memory.

Table 3. Chipkill memory supported configurations

DIMM type	Minimum DIMM size
x4	512 MB

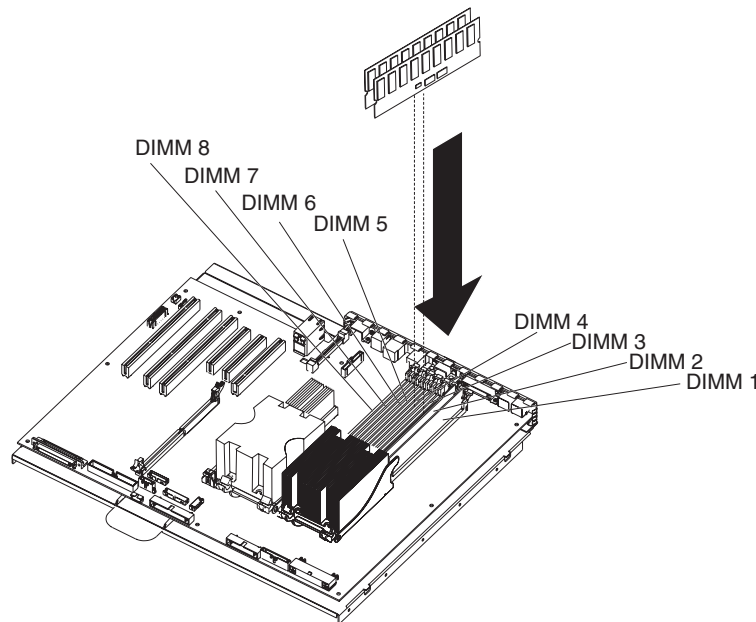
- The server supports Online-Spare memory. See Table 4 for the supported Online-Spare memory configurations.

Table 4. Online-Spare memory supported configurations

System DIMM Pair	DIMM connectors	Online-Spare DIMM Pair	DIMM connectors
1	1 and 2	2	3 and 4
3	5 and 6	4	7 and 8

- You do not have to save new configuration information when installing or removing DIMMs. The only exception is if you replace a faulty DIMM that was marked as **Disabled** in the **Memory Settings** menu. In this case, you must re-enable that memory row in the Configuration/Setup Utility program or reload the default memory settings. See the *User's Guide* on the IBM xSeries Documentation CD for more information.
- When you restart the server after adding or removing a DIMM, the server displays a message that the memory configuration has changed.

The following illustration shows how to install a pair of DIMMs on the system board.



Complete the following steps to install a pair of DIMMs:

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables. Remove the cover and air-baffle assembly.  
**Attention:** To avoid breaking the retaining clips or damaging the DIMM connectors, open and close the clips gently.
3. Open the retaining clip on each end of the DIMM connector.
4. Touch the static-protective package containing the DIMM to any unpainted metal surface on the server. Then, remove the DIMM from the package.
5. Turn the DIMM so that the DIMM keys align correctly with the slot.
6. Insert the DIMM into the connector.
7. Repeat steps 1 through 6 for the second DIMM; then, continue to step 8. If you are replacing a single DIMM, continue to step 8.
8. If you have other options to install or remove, do so now.
9. Replace the air-baffle assembly and cover. Go to “Completing the installation” on page 61.



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## Installing a microprocessor

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

- For a list of supported options for the server, go to <http://www.ibm.com/us/compat/>.
- The server supports Intel Xeon 2.8 GHz or higher microprocessors in each socket. If you are installing two microprocessors, they must be the same cache size and type, and the same clock speed.
- Read the documentation that comes with the microprocessor to determine whether you must update the basic input/output system (BIOS) code in the server. To download the most current level of BIOS code for the server, go to <http://www.ibm.com/support/>.
- Obtain an SMP-capable operating system. For a list of supported operating systems, go to <http://www.ibm.com/pc/us/compat/>.
- You can use the Configuration/Setup Utility program to determine the specific type of microprocessor in the server.
- If the thermal-grease protective cover (for example, a plastic cap or tape liner) is removed from the heat sink or fan sink, do not touch the thermal grease on the bottom of the heat sink or fan sink or set down the heat sink or fan sink.

**Note:** Removing the heat sink or fan sink from the microprocessor destroys the even distribution of the thermal grease and requires replacing the thermal grease. Setting down the heat sink or fan sink on any surface when the thermal-grease protective cover is removed will contaminate the thermal grease. If the thermal grease becomes contaminated with particles, it must be replaced.

For information about replacing contaminated thermal grease on the heat sink, contact IBM Service. For support phone numbers, go to <http://www.ibm.com/planetwide/>, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Have the following information ready when you call:

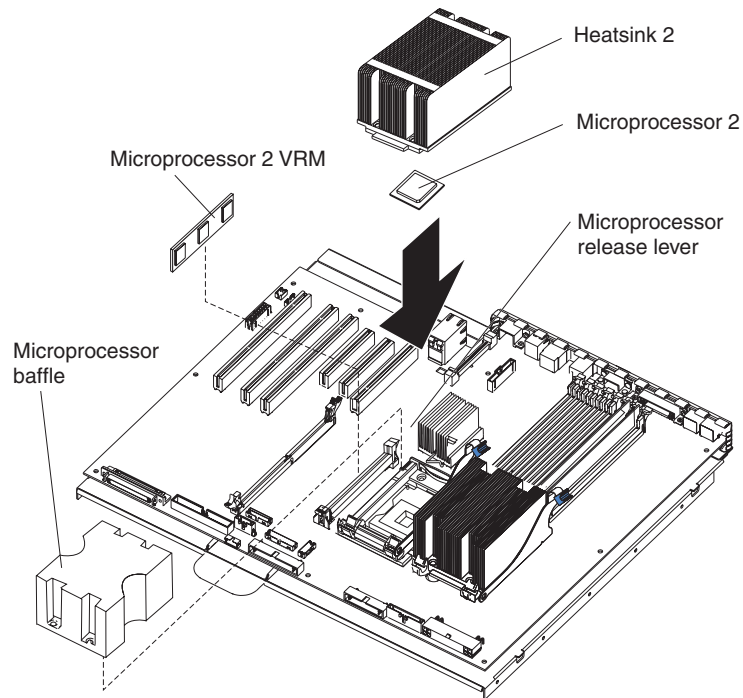
- Machine type and model
- Serial number of the server

Complete the following steps to install a microprocessor:

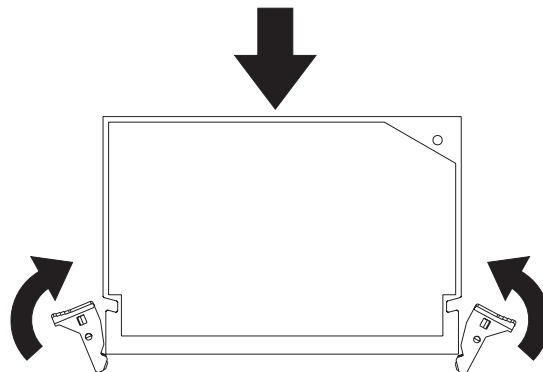
1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables. Remove the cover and air-baffle assembly.

**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 28.

3. Remove the microprocessor baffle and protective film from the second microprocessor socket.



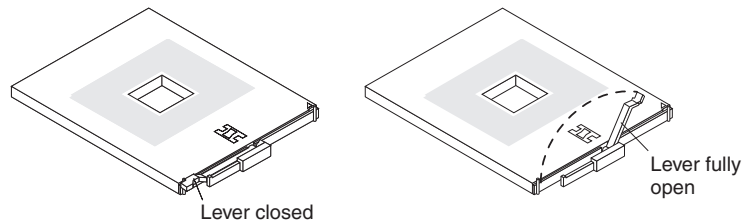
4. Install a VRM in the VRM connector.



- a. Center the VRM over the connector. Make sure that the VRM is oriented and aligned correctly.
- b. Carefully but firmly push down the VRM to seat the VRM in the connector.
- c. Make sure that the VRM clips on both sides of the VRM connector lock.

5. Install the microprocessor:

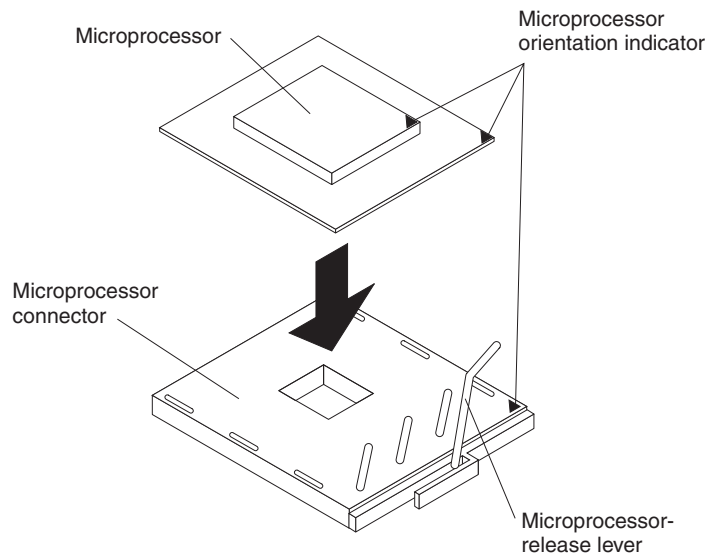
- a. Touch the static-protective package containing the new microprocessor to any unpainted metal surface on the server; then, remove the microprocessor from the package.
- b. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops or clicks in the fully open position (approximately 135° angle).



- c. 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.

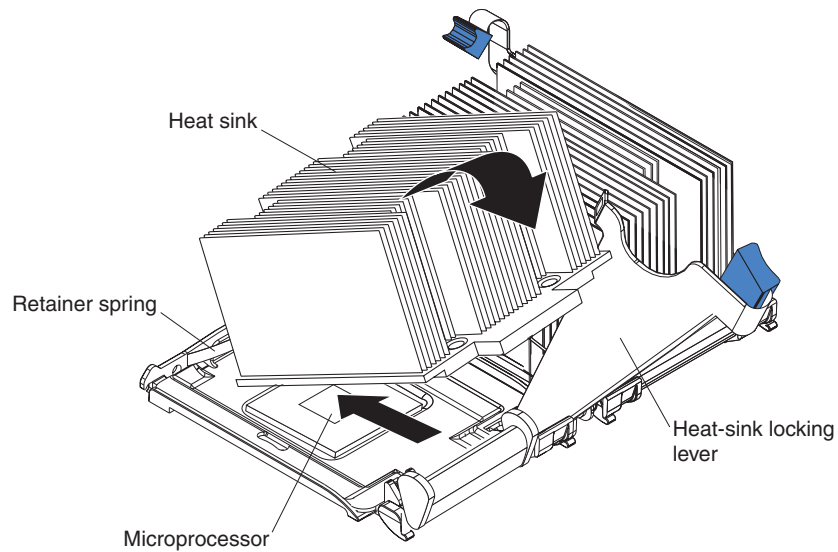
**Attention:**

- Do not use excessing force when pressing the microprocessor into the socket.
- Make sure that the microprocessor is oriented and aligned correctly with pin number 1 in the socket before you try to close the microprocessor-release lever.



- d. Carefully close the microprocessor-release lever to secure the microprocessor in the socket.

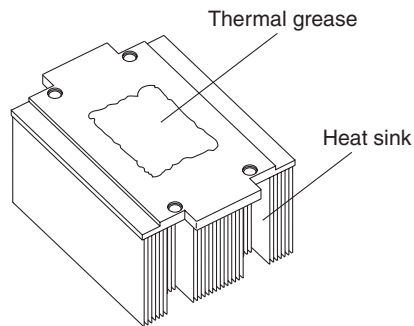
6. Install the heat sink on the microprocessor:



- a. Pull out and lift up on the heat-sink locking lever to open the heat sink retention bracket.
- b. Make sure that the lever is fully extended.
- c. Remove the protective plastic cap from the bottom of the heat sink.

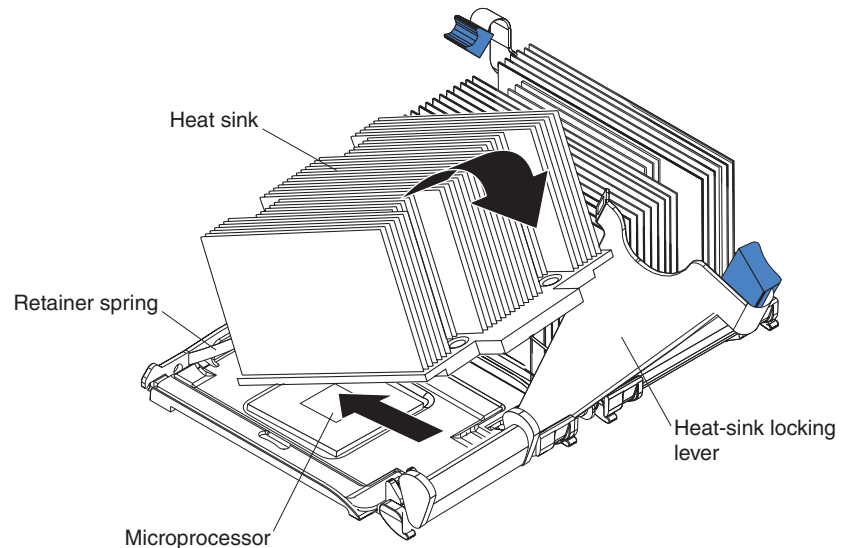
**Notes:**

- 1) Do not set down the heat sink after you remove the protective plastic cap.



- 2) Do not touch the thermal grease on the bottom of the heat sink. Touching the thermal grease on the bottom will contaminate it. If the thermal grease on the heat sink becomes contaminated, contact your service technician.

- d. Position the heat sink over the microprocessor and slide one of the tabs on the heat sink into the slot under the retainer spring.



- e. Push the heat sink into position firmly; then, let it rest on the microprocessor.
  - f. Close the heat-sink locking lever to secure the heat sink to the microprocessor.
7. If you have other options to install or remove, do so now.
  8. Replace the air-baffle assembly and cover. Go to “Completing the installation” on page 61.

## Replacing a microprocessor and heat sink

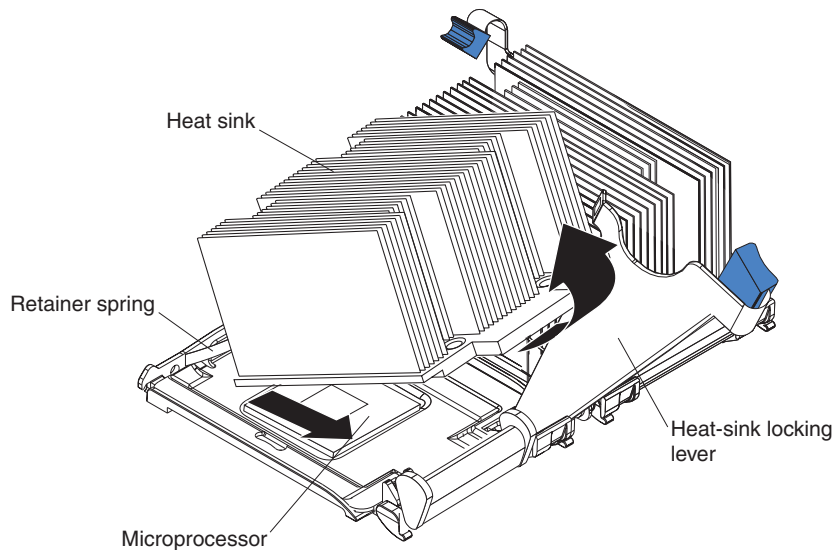
This section provides instructions for replacing a microprocessor and heat sink.

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

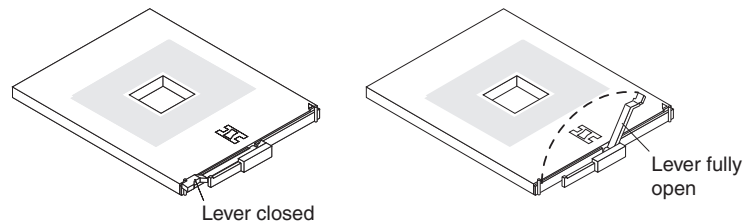
1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables. Remove the cover and air-baffle assembly.

**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 28.

3. Remove the heat sink from the microprocessor:



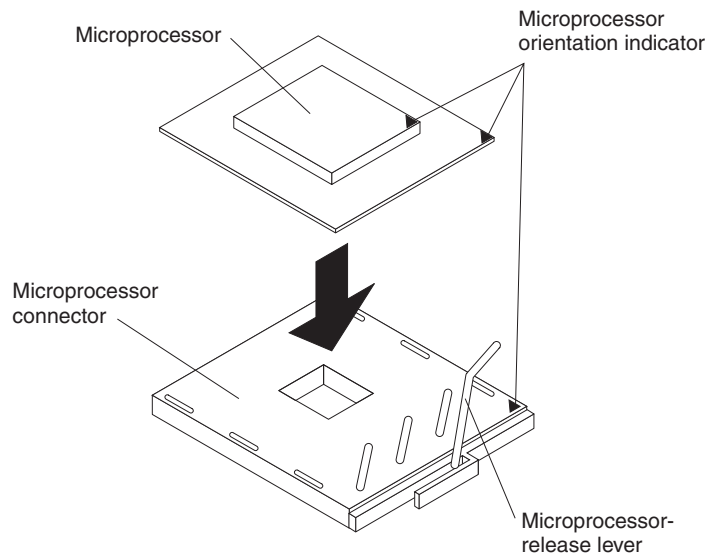
- a. Pull out and lift up on the heat-sink locking lever.
  - b. Lift the heat sink up and out of the server.
4. Remove the microprocessor:
- a. Pull out and lift up on the microprocessor-release lever to unlock the microprocessor socket.
  - b. Remove the microprocessor from the socket and discard it.
5. Install the VRM. If you are replacing the microprocessor in socket 1, go to step 6.
- a. Center the VRM over the connector. Make sure that the VRM is orientated and aligned correctly.
  - b. Carefully but firmly push down the VRM to seat the VRM in the connector.
  - c. Make sure that the VRM clips on both sides of the VRM connector lock.
6. Install the new microprocessor:
- a. Touch the static-protective package containing the new microprocessor to any unpainted metal surface on the server; then, remove the microprocessor from the package.
  - b. 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).



- c. Center the microprocessor over the microprocessor socket. Align the triangle on the corner on the microprocessor with the triangle on the corner of the socket and carefully press the microprocessor into the socket.

**Attention:**

- Do not use excessive force when pressing the microprocessor into the socket.
- Make sure that the microprocessor is oriented and aligned correctly with pin number 1 in the socket before you try to close the microprocessor release lever.

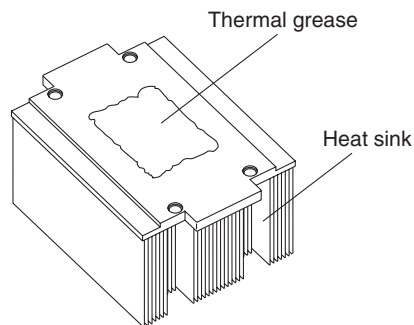


- Carefully close the microprocessor-release lever to secure the microprocessor in the socket.

7. Install a heat sink on the microprocessor.

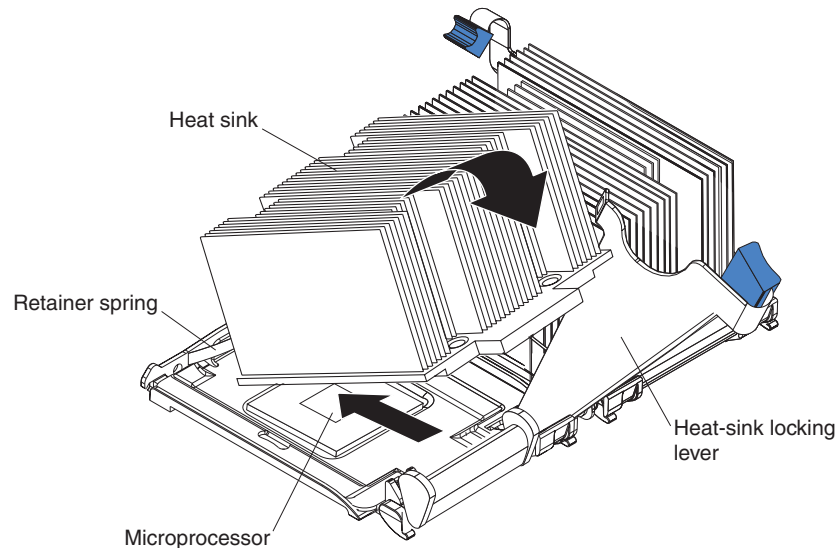
**Attention:**

- Do not set down the heat sink after you remove the plastic cover.



- Do not touch the thermal grease on the bottom of the heat sink or set down the heat sink. Touching the thermal grease will contaminate it. For details, see the information about thermal grease on page 51.
  - a. Remove the plastic protective cover from the bottom of the heat sink.
  - b. Make sure that the heat-sink lever is in the open position.

- c. Position the heat sink over the microprocessor and slide one of the tabs on the heat sink into the slot on the retention bracket.



- d. Push the heat sink into position firmly; then, let it rest on the microprocessor.  
e. Close the heat-sink locking lever to secure the heat sink to the microprocessor.
8. Replace the air-baffle assembly and cover. Go to “Completing the installation” on page 61.

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## Replacing the battery

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

- When the battery voltage becomes low, the Battery Error LED on the system board is lit and the battery should be replaced as quickly as possible.
- 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.

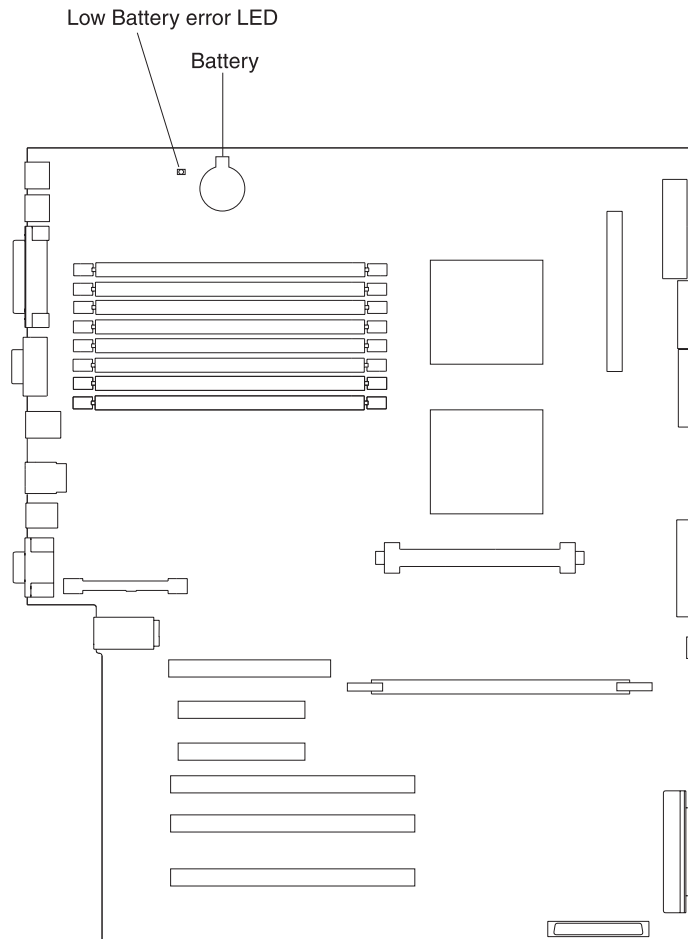
### **Do not:**

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

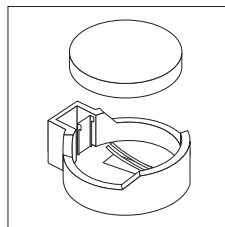
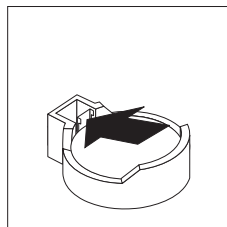
**Dispose of the battery as required by local ordinances or regulations.**

Complete the following steps to replace the battery:

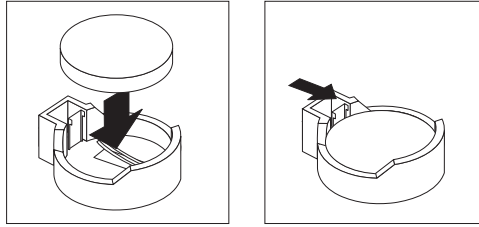
1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Follow any special handling and installation instructions that come with the battery.
3. Turn off the server and all attached devices and disconnect all power cords and external cables (see “Turning on the server” on page 7); then, remove the server cover (see “Removing the left-side cover” on page 30).
4. Remove the air baffle. See “Removing the air baffle” on page 31.
5. Disconnect any internal cables, as necessary.
6. Locate the battery connector on the system board.



7. Remove the battery:
  - a. Use one finger to press on the tab that secures the battery to its housing.
  - b. Use one finger to slide the battery from the socket.



8. Insert the new battery:
  - a. Hold the battery so that the larger side is facing up.
  - b. Place the battery into its socket, and press the battery down until it snaps into place.



9. Reconnect the internal cables that you disconnected.
10. Connect all external cables and all power cords.
11. Reinstall the air baffle.
12. Reinstall the server cover. See “Completing the installation.”
13. Start the Configuration/Setup Utility program and set configuration parameters as needed. See the *User's Guide* on the IBM xSeries Documentation CD for additional information about using the Configuration/Setup Utility program.

---

## Completing the installation

To complete the installation, reinstall the bezel, reinstall the server cover, reinstall the door, reconnect all the cables that you disconnected earlier, and for certain options, run the Configuration/Setup Utility program. Follow the instructions in this section.

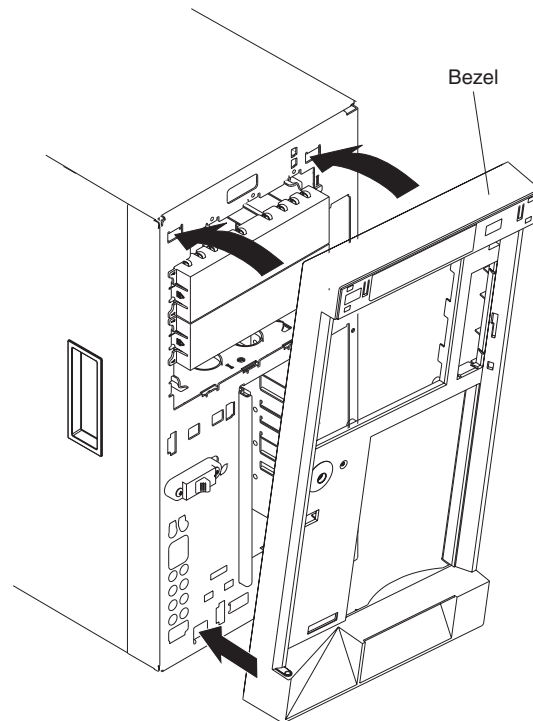
**Attention:**

- For proper cooling and airflow, replace the server cover before or shortly after turning on the server. Operating the server for extended periods of time (over 30 minutes) with the server cover removed might damage server components.
- To ensure proper server operation, do not remove the air-baffle assembly from the server except when installing or removing the components that are under the air-baffle cover.

**Note:** If you have just connected the power cords to electrical outlets, you must wait approximately 20 seconds before pressing the power-control button.

## Installing the server bezel and left-side cover

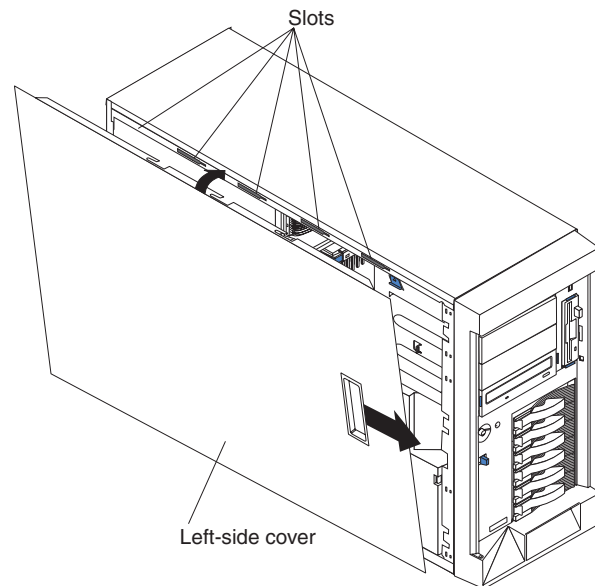
The following illustration shows how to install the bezel on the server.



Complete the following steps to install the bezel:

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Insert the two tabs on the bottom of the bezel into the matching holes on the server chassis.
3. Push the top of the bezel toward the server until the two tabs at the top of the bezel snap into place.

The following illustration shows how to install the left-side cover on the server.



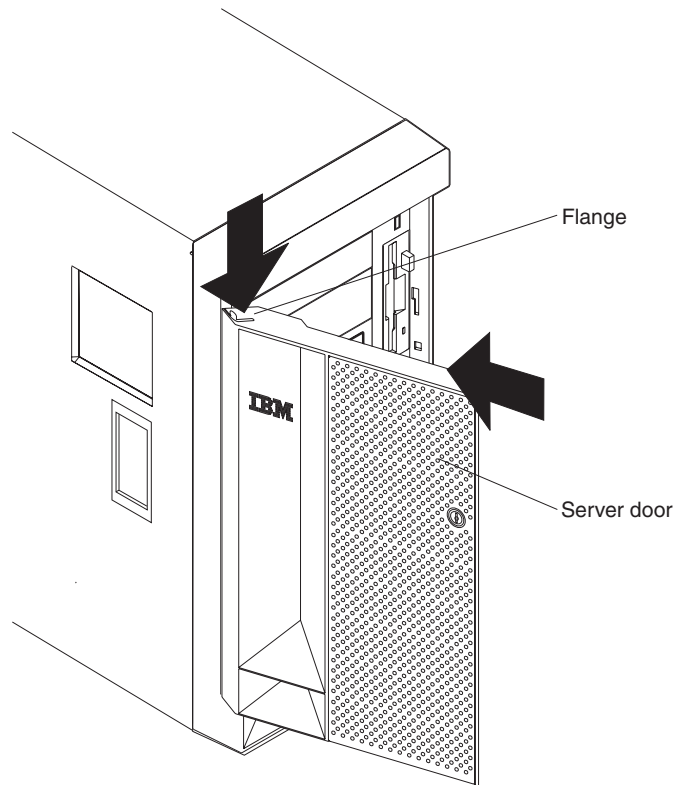
Complete the following steps to install the server left-side cover:

1. Before installing the cover, check that all cables, adapters, and other components are installed and seated correctly and that you have not left loose tools or parts inside the server.
2. Place the bottom lip of the left-side cover over the bottom edge of the server chassis.
3. Rotate the left-side cover to a vertical position, inserting the tabs at the top of the left-side cover into the matching slots in the server chassis.
4. Slide the left-side cover forward until it locks in place.
5. If you disconnected any cables from the back of the server, reconnect the cables; then, connect the power cords to properly grounded electrical outlets.

**Note:** If necessary, see “Input/output connectors” on page 67 for connector locations.

## Installing the server door

The following illustration shows how to install the door on the server.



Complete the following steps to install the server door:

1. Read the safety information beginning on page v and “Installation guidelines” on page 27.
2. Set the door on the bottom hinge.
3. Locate the flange on the top edge of the door.
4. Press the flange downward while pressing the top of the door toward the server until the flange connects with the top hinge. Release the flange.
5. Close the server door.

**Attention:** Be sure to maintain a clearance of at least 100 mm (4 inches) on the front and rear of the server to allow for air circulation.

## Connecting the cables

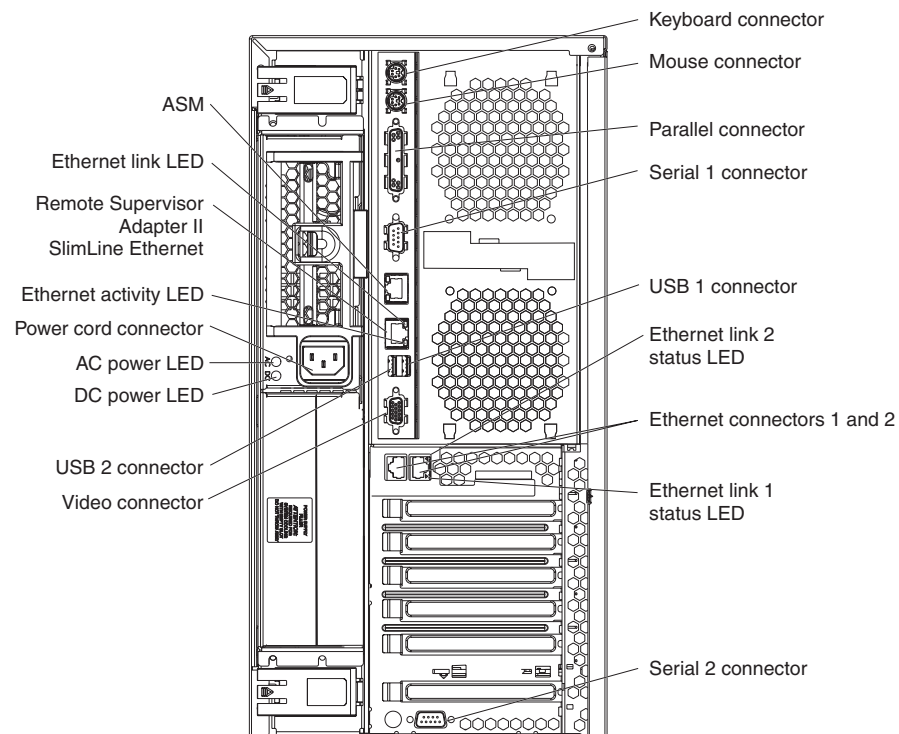
### Notes:

1. Make sure you turn off the server before connecting any cables to or disconnecting any cables from the server or hot-plug adapter.
2. For additional cabling instructions, see the *User's Guide* on the IBM xSeries *Documentation CD* and the documentation that comes with the options. It might be easier for you to route any 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. For example, the hard disk drive cables are labeled "HDD option."

Two cable-restraint brackets are on the rear of the server. Route the power cords through the power-cord restraint bracket. After you connect the cables to the selected devices, route the cables (for example, the cables that are connected to the I/O connectors) through the I/O cable-restraint bracket.

See the following illustrations for the locations of the input and output connectors on the server.

**Note:** The USB 3 connector is on the front of the server.



## 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 *User's Guide* and the operating-system documentation.

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

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

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

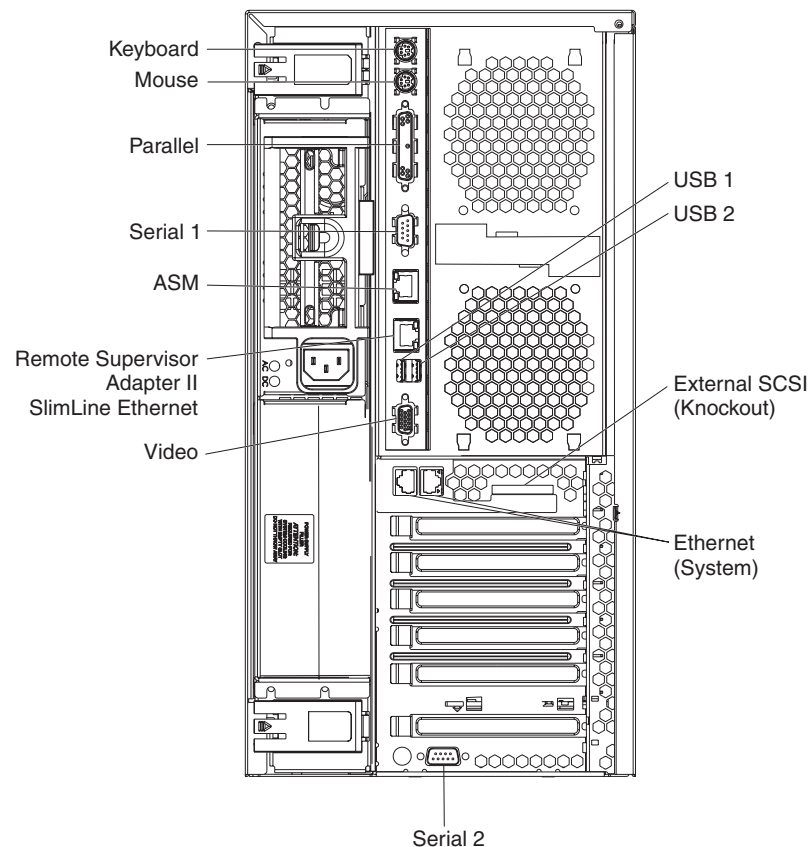


## Input/output connectors

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

- One auxiliary-device (mouse)
- Two Gigabit Ethernet (RJ-45)
- Two integrated system management (Remote Supervisor Adapter II SlimLine Ethernet and ASM)
- One keyboard
- One parallel
- Two serial
- Three Universal Serial Bus (USB)
  - Two on the rear of the server
  - One on the front of the server (not shown)
- One video

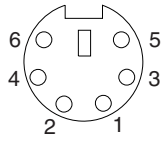
The following illustration shows the locations of the connectors on the rear of the server.



The following sections describe these connectors.

## Auxiliary-device connector

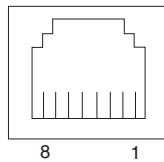
Use this connector to connect a mouse or other pointing device. The following illustration shows an auxiliary-device connector.



## Ethernet connector

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

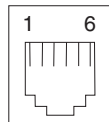
For more information about the Ethernet controllers, see the *User's Guide*.



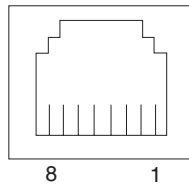
## Integrated system management (Remote Supervisor Adapter II SlimLine Ethernet and ASM) connector

Use these connectors to connect an optional Remote Supervisor Adapter II SlimLine. The following illustrations show the integrated system management connectors.

ASM (RS-485)

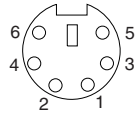


Remote Supervisor Adapter II SlimLine Ethernet (RJ-45)



## Keyboard connector

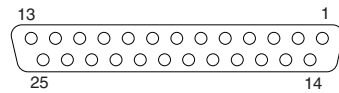
Use this connector to connect a PS/2 (non-USB) keyboard to the server. The following illustration shows a keyboard connector.



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

## Parallel port connector

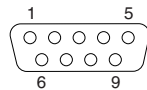
Use this connector to connect a parallel device. The following illustration shows a parallel connector.



The parallel connector supports three Institute of Electrical and Electronics Engineers (IEEE) 1284 modes of operation: Standard Parallel Port (SPP), Enhanced Parallel Port (EPP), and Extended Capability Port (ECP). If you configure the parallel port to operate in bidirectional mode, it supports the EPP and ECP modes of operation. To configure the parallel port, use the **Devices and I/O Ports** option in the Configuration/Setup Utility program. See the *User's Guide* for more information. If you configure the parallel port to operate in bidirectional mode, use an IEEE 1284-compliant cable that does not exceed 3 meters (9.8 ft).

## Serial-port connectors

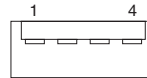
Use a serial connector to connect a serial device. The following illustration shows a serial connector.



## Universal Serial Bus connectors

The server has one Universal Serial Bus (USB) version 2.0 connector on the front of the server and two USB version 2.0 connectors on the rear of the server.

USB is a serial interface standard for telephony and multimedia devices. It uses Plug and Play technology to determine the type of device that is attached to the connector.



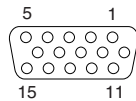
### Notes:

1. If you attach a standard (non-USB) keyboard to the keyboard connector, the USB ports and devices will be disabled during the power-on self-test (POST).
2. If you install a USB keyboard that has a mouse port, the USB keyboard emulates a mouse, and you will not be able to disable the mouse settings in the Configuration/Setup Utility program.
3. Check to make sure that your NOS supports USB devices.
4. For additional information about USB version 1.1 or 2.0 devices, go to <http://www.usb.org/>.

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.

## Video connector

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



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## Chapter 5. Service replaceable units

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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 Chapter 7, “Parts listing Type 8841,” on page 141 to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU.

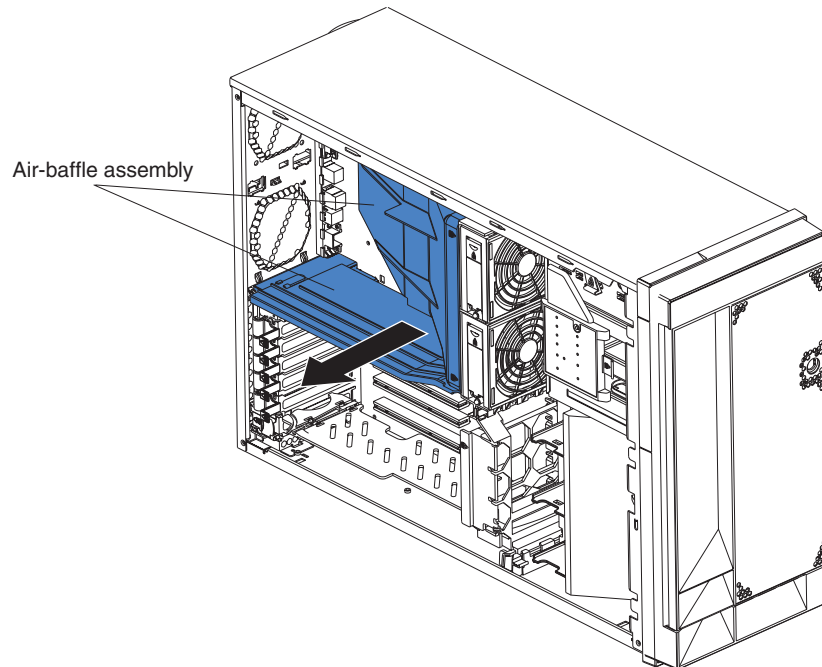
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## Microprocessor removal

Complete the following steps to remove a microprocessor.

**Note:**

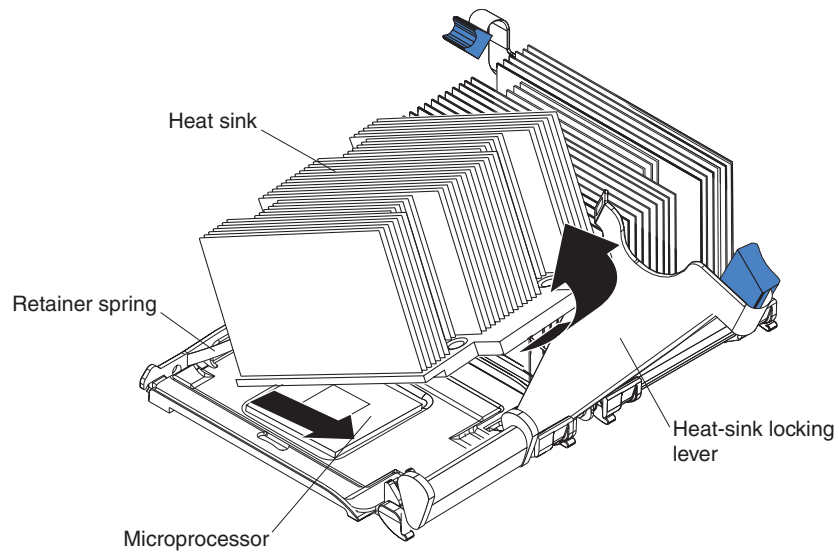
- Read “Installation guidelines” on page 27.
  - Read Appendix B, “Safety information,” on page 151.
  - Read “Handling static-sensitive devices” on page 28.
1. Turn off the server and disconnect all power cords and external cables; then, remove the server cover (see “Removing the left-side cover” on page 30).
  2. Remove the air-baffle.



**Note:** It might be easier to turn the server on its side to remove the air baffle and access the microprocessors.

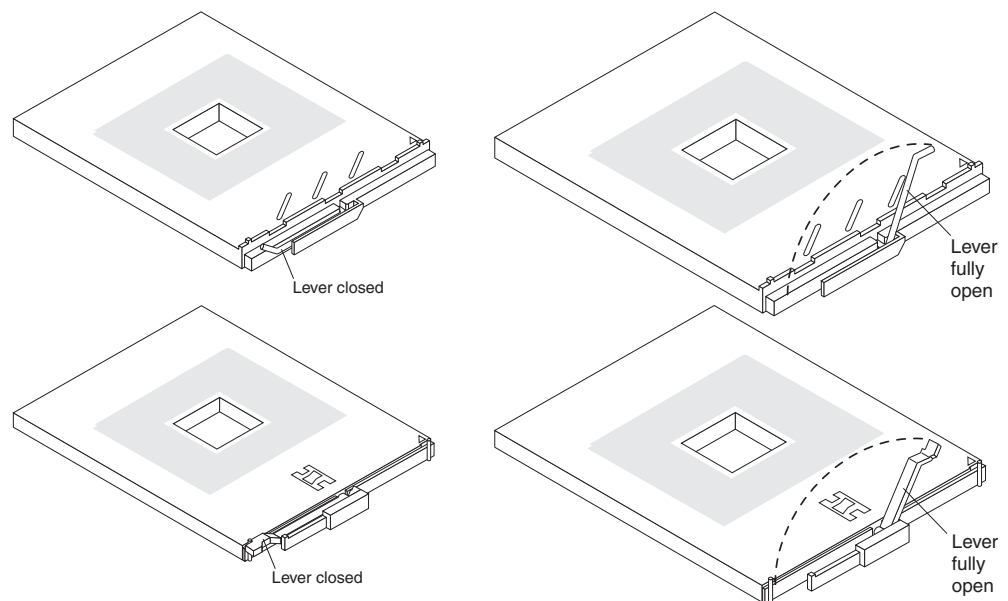
3. Identify the microprocessor to be removed.

4. Remove the heat sink from the microprocessor:

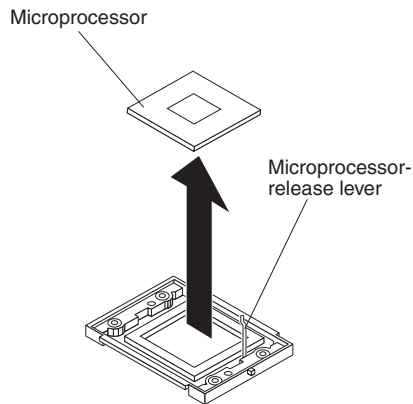


- a. Pull out and lift up on the heat-sink locking lever to unlock the heat sink retention bracket.
  - b. Lift the heat sink up and out of the server.
5. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops or clicks in the fully open position (approximately 135° angle), as shown. Then, see the documentation provided with the microprocessor option for complete installation instructions.

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



- Pull the microprocessor out of the socket.



To install a microprocessor, see “Installing a microprocessor” on page 51

---

## Thermal grease

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

**Note:**

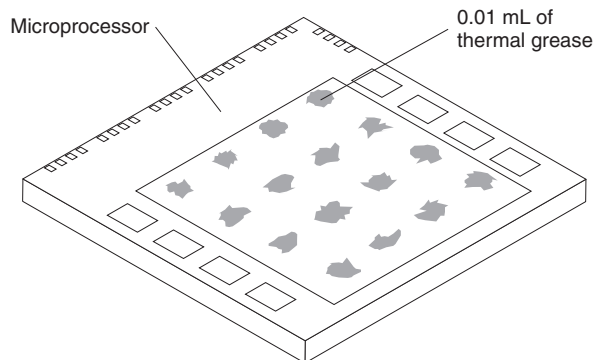
- Read “Installation guidelines” on page 27.
- Read Appendix B, “Safety information,” on page 151.
- Read “Handling static-sensitive devices” on page 28.

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

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

**Note:** Be sure that all of the thermal grease is removed.

4. Use a clean area of the cleaning pad to wipe the thermal grease from the microprocessor; then, dispose of the cleaning pad after all of the thermal grease is removed.





5. Use the thermal grease syringe to place 16 uniformly spaced dots of 0.01mL each on the top of the microprocessor.



**Note:** 0.01mL is one tick mark on the syringe. If the grease is properly applied, approximately half (0.22mL) of the grease will remain in the syringe.

6. Install the heat sink onto the microprocessor as described in “Installing a microprocessor” on page 51.

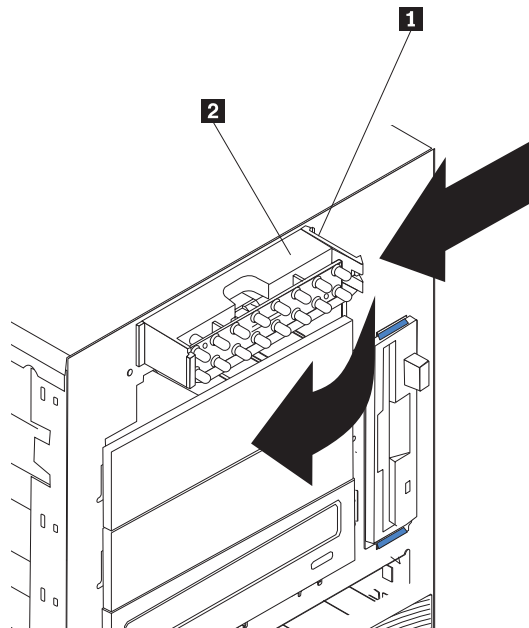
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## Operator information panel (external LED card)

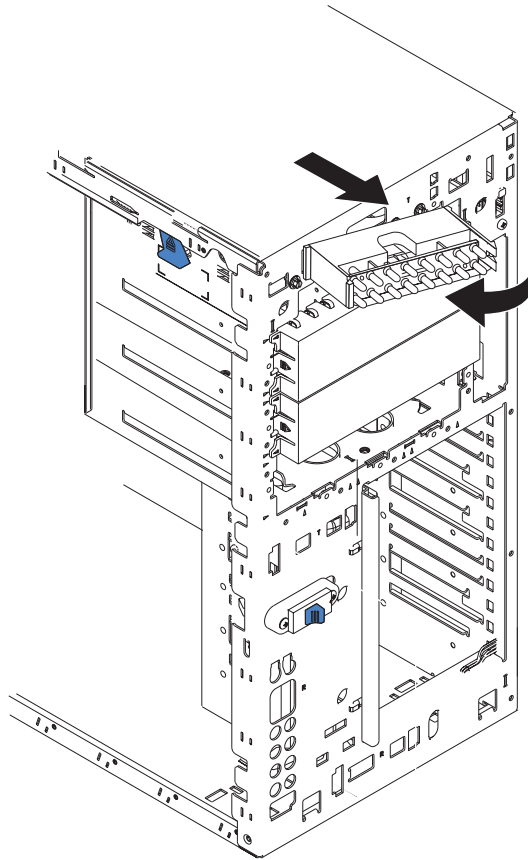
Complete the following steps to remove the operator information panel.

**Note:**

- Read “Installation guidelines” on page 27.
  - Read Appendix B, “Safety information,” on page 151.
  - Read “Handling static-sensitive devices” on page 28.
1. Turn off the server and any attached devices.
  2. Disconnect all external cables and power cords from the back of the server.
  3. Remove the server cover (see “Removing the left-side cover” on page 30).
  4. Remove the front bezel (see “Removing the bezel” on page 32).
  5. Disconnect and remove adapters and spacers (see “Installing or replacing an adapter” on page 41).
  6. Remove the two central fans (see “Replacing a center fan (3 or 4)” on page 35).
  7. Remove the plastic baffle.
  8. Disconnect the operator information panel cable from the system board.



9. From outside the server, push the tab **1** on the panel **2**, making sure to press the tab near the chassis; the panel will disengage from the chassis.



10. Remove the panel, carefully threading the cable past the other components and through the opening in the chassis.

**Note:** If the cable has been secured in the cable clamps, gently pull it out of the clamps before pulling the cable through the opening in the chassis.

To install the operator information panel, reverse the previous steps.

**Notes:**

1. Thread the cable through the opening in the chassis and extend it into the server before attaching the operator information panel.
2. Secure the cable in the cable clamps along the inside of the chassis.
3. Fit the left tab (in the rack configuration, this is the top tab) into the lip on the chassis, and then press on the right tab (in the rack configuration, this is the bottom tab) until it snaps into place.

---

## Diagnostics panel card

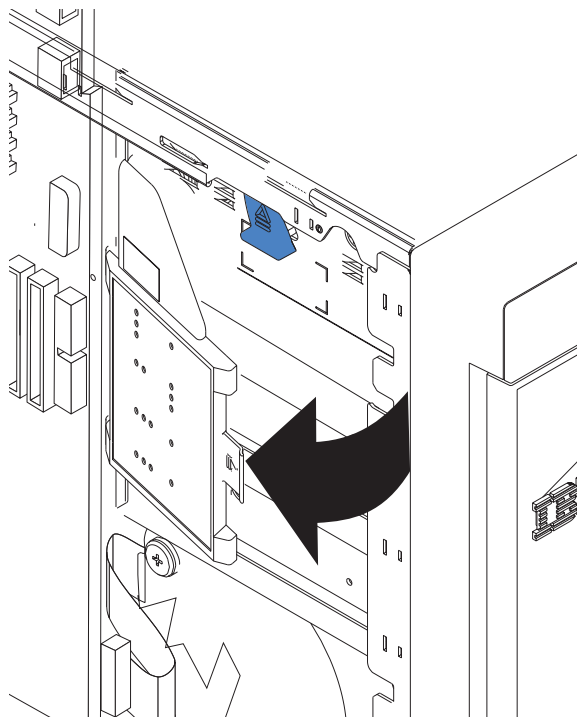
Complete the following steps to remove the diagnostics panel card.

**Note:**

- Read “Installation guidelines” on page 27.
- Read Appendix B, “Safety information,” on page 151.
- Read “Handling static-sensitive devices” on page 28.

1. Turn off the server.
2. Disconnect all external cables and power cords from the back of the server.
3. Remove the server cover (see “Removing the left-side cover” on page 30).
4. Disconnect and remove adapters and spacers (see “Installing or replacing an adapter” on page 41).
5. Remove the two center fans (see “Replacing a center fan (3 or 4)” on page 35).
6. Remove the plastic baffle.
7. Disconnect the diagnostics panel card cable from the system board (J36).

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



8. Grasp the tab on the diagnostics panel card and gently pull up and to the right until the card assembly releases.

To replace the diagnostics panel card, line up the two notches on the left and snap the assembly into place; then, connect the cable to the system board.

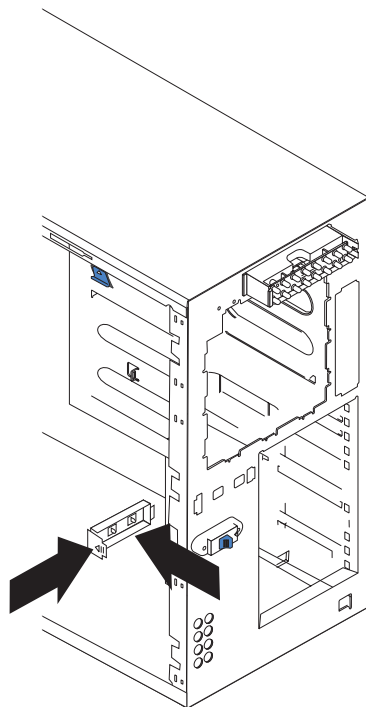
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## Power reset card

Complete the following steps to remove the power reset card.

**Note:**

- Read “Installation guidelines” on page 27.
  - Read Appendix B, “Safety information,” on page 151.
  - Read “Handling static-sensitive devices” on page 28.
1. Turn off the server.
  2. Disconnect all external cables and power cords from the back of the server.
  3. Remove the bezel (see “Removing the bezel” on page 32).
  4. Remove the server cover (see “Removing the left-side cover” on page 30).
  5. Disconnect and remove adapters and spacers (see “Installing or replacing an adapter” on page 41).
  6. Remove the central-fan and adapter-support bracket (see “Center-fan and adapter-support bracket” on page 83).
  7. Remove the air baffle.
  8. Disconnect the power reset card cable from the system board (J42).



9. Press the tab on the front of the power reset card and lift it out from inside the chassis.

To replace the power reset card, reverse the previous steps, threading the cable carefully.

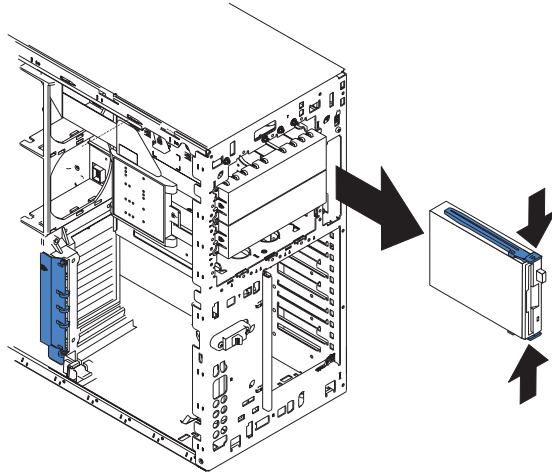
---

## Diskette drive

Complete the following steps to remove the diskette drive.

**Note:**

- Read “Installation guidelines” on page 27.
  - Read Appendix B, “Safety information,” on page 151.
  - Read “Handling static-sensitive devices” on page 28.
1. Turn off the server and all attached devices.
  2. Disconnect all external cables and power cords from the back of the server.
  3. Remove the server cover (see “Removing the left-side cover” on page 30).
  4. Remove the front bezel (see “Removing the bezel” on page 32).



5. Press in on the two blue diskette drive release tabs until the drive is released from the chassis.
6. Carefully pull the drive away from the chassis until the cables at the rear of the drive are accessible.
7. Remove the two cables from the back of the drive and pull the drive out.

To replace the diskette drive, reverse the previous steps.

**Note:** If you are replacing the drive, prepare the new drive for the server with the following procedure:

1. Remove the side rails from the drive by gently pulling them away from the drive until they detach.
2. Insert one pin of the rail into the notch near the rear of the drive.
3. Pushing the rail gently toward the rear of the drive, insert the other pin into the notch near the front of the drive.
4. Press in on the metal strip in the rail to secure the rail to the drive.

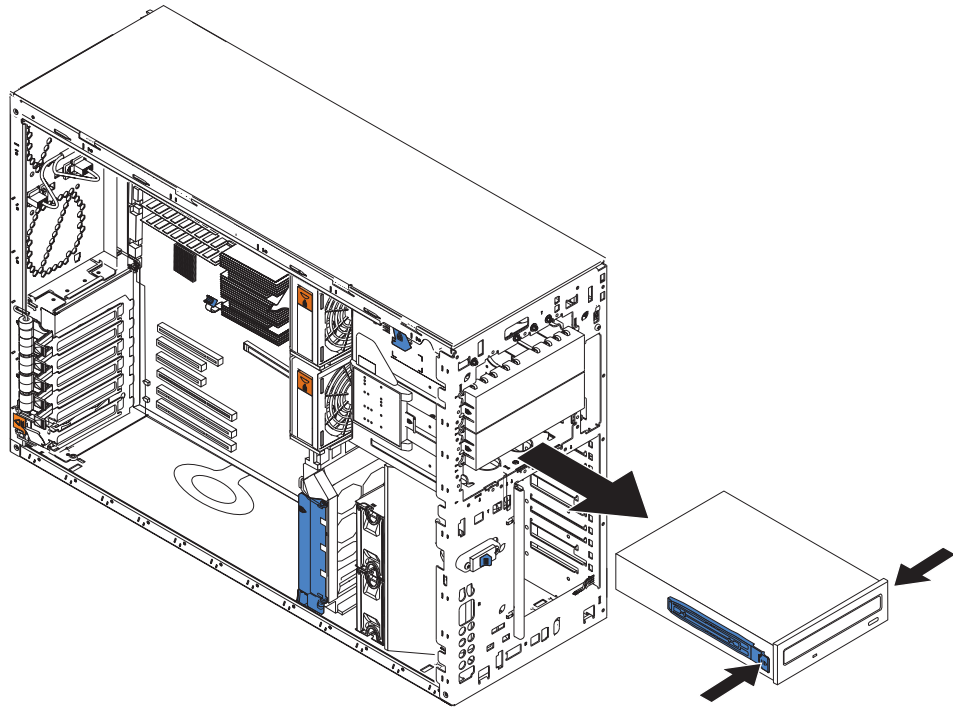
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## CD-ROM drive

Complete the following steps to remove the CD-ROM drive.

**Note:**

- Read “Installation guidelines” on page 27.
  - Read Appendix B, “Safety information,” on page 151.
  - Read “Handling static-sensitive devices” on page 28.
1. Turn off the server and all attached devices.
  2. Disconnect all external cables and power cords from the back of the server.
  3. Remove the server cover (see “Removing the left-side cover” on page 30).
  4. Remove the front bezel (see “Removing the bezel” on page 32).



5. Press in on the two blue CD-ROM drive release tabs until the drive is released from the chassis.
6. Carefully pull the drive away from the chassis until the cables at the rear of the drive are accessible.
7. Remove the two cables from the back of the drive and pull the drive out.

To replace the CD-ROM drive, reverse the previous steps.

**Note:** If you are replacing the drive, prepare the new drive for the server with the following procedure:

1. Remove the side rails from the drive by gently pulling them away from the drive until they detach.
2. Insert one pin of the rail into the notch near the rear of the drive.
3. Pushing the rail gently toward the rear of the drive, insert the other pin into the notch near the front of the drive.
4. Press in on the metal strip in the rail to secure the rail to the drive.

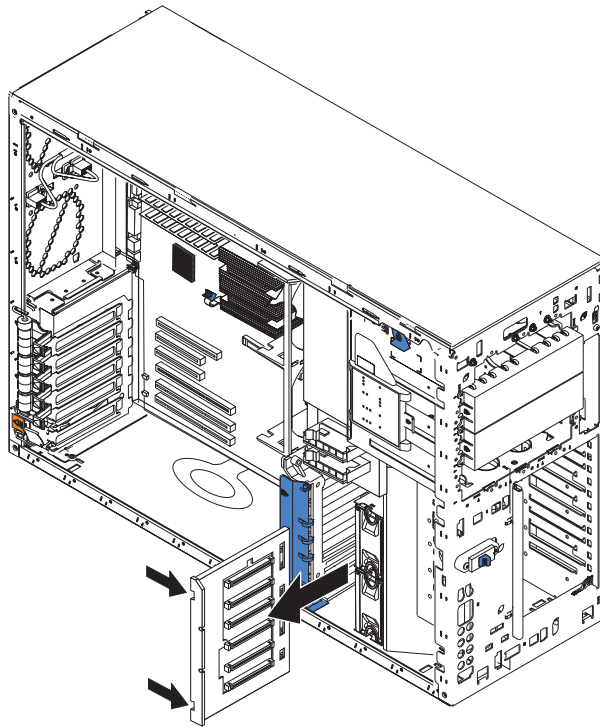
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## Hard disk drive backplane

Complete the following steps to remove the hard disk drive backplane.

**Note:**

- Read “Installation guidelines” on page 27.
  - Read Appendix B, “Safety information,” on page 151.
  - Read “Handling static-sensitive devices” on page 28.
1. Turn off the server.
  2. Disconnect all external cables and power cords from the back of the server.
  3. Pull out the hard drives.
  4. Remove the server cover (see “Removing the left-side cover” on page 30).
  5. Remove the two front fans (see “Replacing a front fan (1 or 2)” on page 34).
  6. Disconnect and remove adapters and spacers (see “Installing or replacing an adapter” on page 41).
  7. Remove the two central fans (see “Replacing a center fan (3 or 4)” on page 35).
  8. Remove the plastic baffle.
  9. Disconnect the hard disk drive backplane cable from the hard disk drive backplane.



10. Press the release latches and pull the backplane out of the server.

To replace the hard disk drive backplane, reverse the previous steps, making sure to place the backplane assembly over the two guide pins on the chassis floor.

---

## Power supply cage assembly

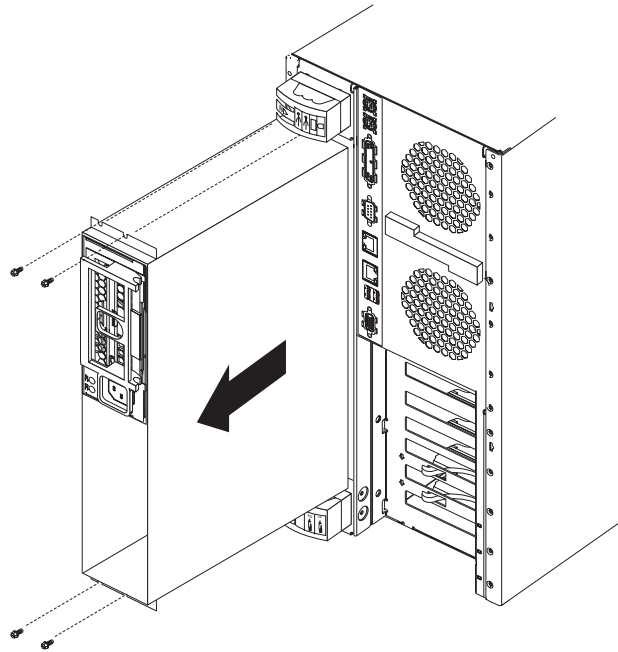
Complete the following steps to remove the power supply cage assembly.

**Note:**

- Read “Installation guidelines” on page 27.
  - Read Appendix B, “Safety information,” on page 151.
  - Read “Handling static-sensitive devices” on page 28.
1. Turn off the server.
  2. Disconnect all external cables and power cords from the back of the server.
  3. Remove the adapter-support bracket. See “Center-fan and adapter-support bracket” on page 83 for instructions.
  4. Disconnect all power-supply cable from the system board (J4), hard disk drive backplane, and other backplanes or devices.



5. From the rear of the server, remove the two screws at each side of the power supply cage.



6. Gently pull the power supply cage from the server, making sure the cables do not snag on the chassis or system board.

**Note:** You might need to insert the blade of a screwdriver behind one corner of the power supply cage to begin moving it.

---

## Center-fan and adapter-support bracket

**Note:**

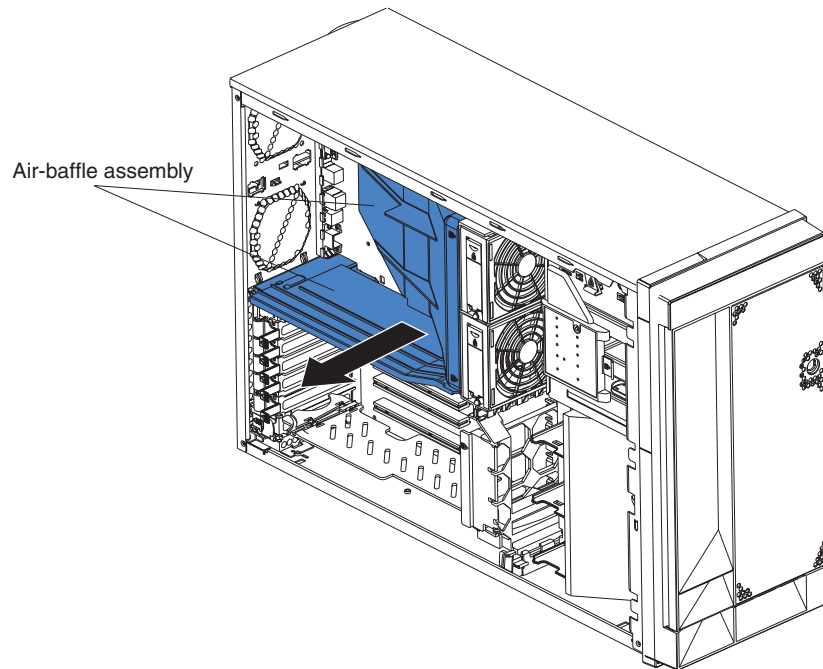
- Read “Installation guidelines” on page 27.
- Read Appendix B, “Safety information,” on page 151.
- Read “Handling static-sensitive devices” on page 28.

When working with some options, you must first remove the center-fan and or adapter-support bracket to access certain components or connectors on the system board.

**Note:** The adapter-support bracket is attached to the center-fan bracket. Both brackets can be removed and installed together as a single unit or individually. See “Center-fan support bracket (dual fan guide)” on page 85 or “Adapter-support bracket” on page 86 for instructions on how to remove these support brackets separately.

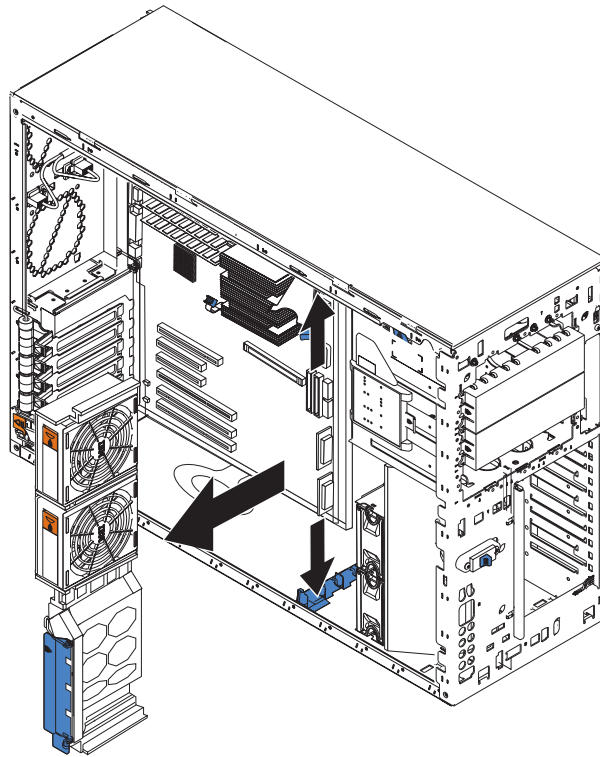
Complete the following steps to remove the center-fan and adapter-support brackets as a single unit:

1. Turn off the server and disconnect all power cords and external cables (“Turning off the server” on page 8); then, remove the server cover (see “Removing the left-side cover” on page 30).
2. Slide the air-baffle assembly out of the guides; then, remove it from the server.



3. Disconnect any cables that are connected to the full-length adapters.
4. Lift the adapter-retention clip on top of the adapter-support bracket (for the location of this clip, see the illustration at “Installing or replacing a hot-plug adapter (slot 6)” on page 44); then, remove the full-length adapters and plastic dividers.
5. Disconnect the end of the cable that is attached to the center-fans connector on the system board (see “System-board internal connectors” on page 94).

6. Remove the center-fan and adapter-support bracket.



- a. Press the release tab on each adapter-support bracket latch. There are two latches; one at each end of the adapter-support bracket.
- b. Slide the adapter-support bracket and fan-support bracket unit out of the guides; then, remove it from the server.

**Note:** To reinstall the adapter-support bracket and other components that you removed or disconnected, reverse the preceding steps. Remember to reroute the cables that you disconnected and to reconnect the center-fan cable to the system board (see “System-board internal connectors” on page 94).

## Center-fan support bracket (dual fan guide)

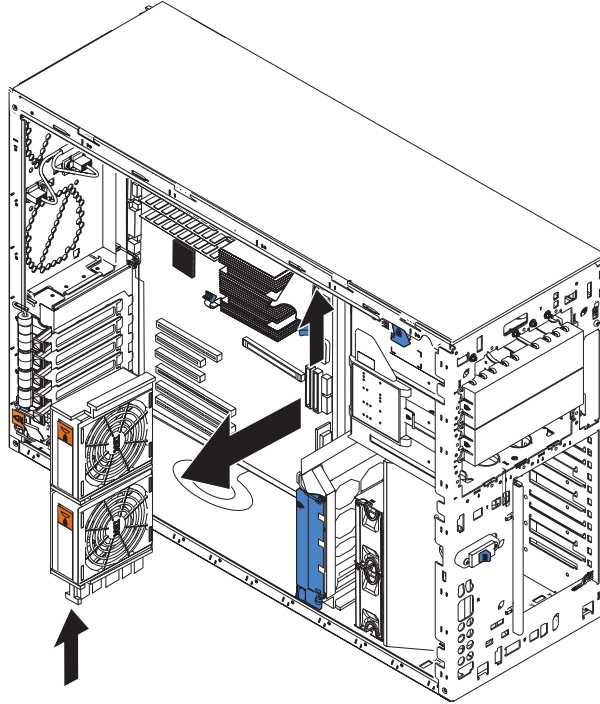
**Note:**

- Read “Installation guidelines” on page 27.
- Read Appendix B, “Safety information,” on page 151.
- Read “Handling static-sensitive devices” on page 28.

When working with some options, you must first remove the center-fan to access certain components or connectors on the system board.

Complete the following steps to remove the center-fan support bracket as a single unit:

1. Disconnect the cable that is attached to the center-fans connector on the system board (see “System-board internal connectors” on page 94).
2. Remove the center-fan support bracket.



- a. Press the release tab on each end of the center-fan support bracket. There are two latches; one at each end of the center-fan support bracket.
- b. Slide the center-fan support bracket unit out of the guides; then, remove it from the server.

**Note:** To reinstall the center-fan support bracket and other components that you removed or disconnected, reverse the preceding steps. Remember to reroute the cables that you disconnected and to reconnect the center-fan cable to the system board (see “System-board internal connectors” on page 94).

## Adapter-support bracket

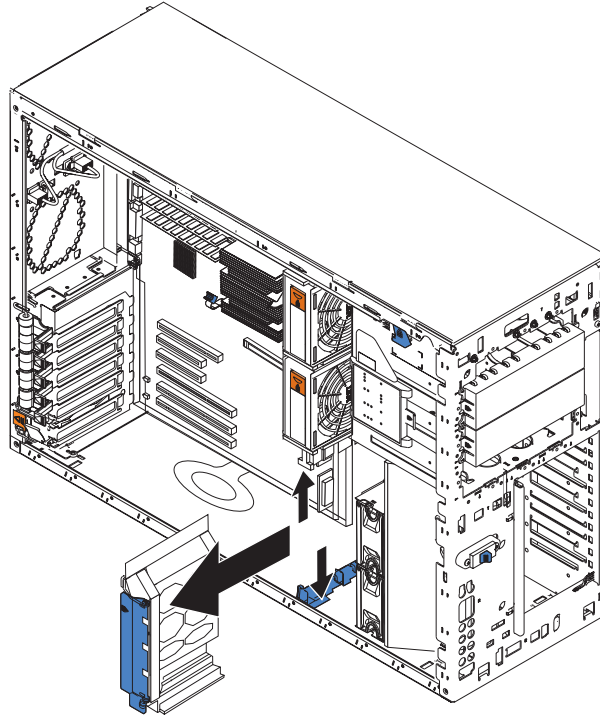
**Note:**

- Read “Installation guidelines” on page 27.
- Read Appendix B, “Safety information,” on page 151.
- Read “Handling static-sensitive devices” on page 28.

When working with some options, you must first remove the adapter-support bracket to access certain components or connectors on the system board.

Complete the following steps to remove the adapter-support bracket as a single unit:

1. Disconnect any cables that are connected to the full-length adapters.
2. Lift the adapter-retention clip on top of the adapter-support bracket (for the location of this clip, see the illustration at “Installing or replacing a hot-plug adapter (slot 6)” on page 44; then, remove the full-length adapters and plastic dividers.
3. Remove the adapter-support bracket.



- a. Press the release tab on each end of the adapter-support bracket. There are two latches; one at each end of the adapter-support bracket.
- b. Slide the adapter-support bracket out of the guides; then, remove it from the server.

**Note:** To reinstall the adapter-support bracket and other components that you removed or disconnected, reverse the preceding steps. Remember to reroute the cables that you disconnected and to reconnect the center-fan cable to the system board (see “System-board internal connectors” on page 94).

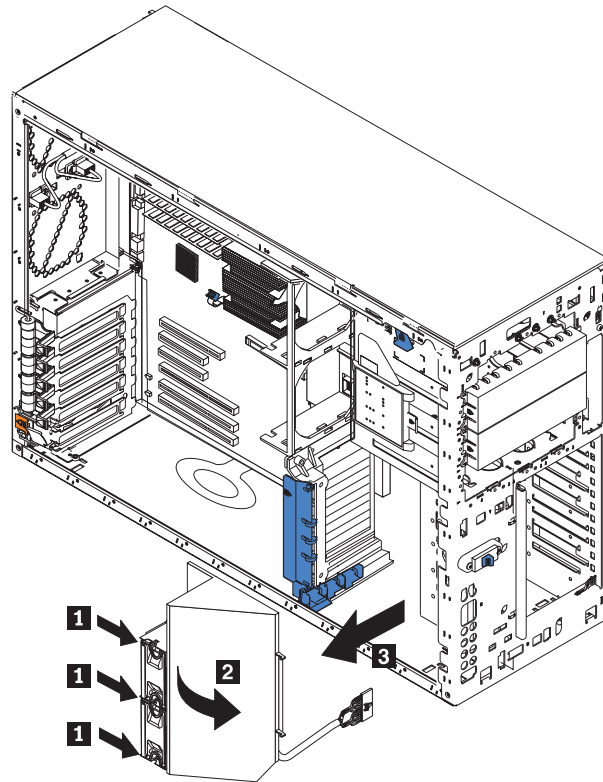
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## Front fan housing (PCI fan guide)

Complete the following steps to remove the blower housing.

**Note:**

- Read “Installation guidelines” on page 27.
  - Read Appendix B, “Safety information,” on page 151.
  - Read “Handling static-sensitive devices” on page 28.
1. Turn off the server.
  2. Disconnect all external cables and power cords from the back of the server.
  3. Remove the front bezel (see “Removing the bezel” on page 32).
  4. Remove the server cover (see “Removing the left-side cover” on page 30).
  5. Remove the two front fans (see “Replacing a front fan (1 or 2)” on page 34).
  6. Disconnect and remove adapter cards and spacers (see “Installing or replacing an adapter” on page 41).
  7. Remove the two central fans (see “Replacing a center fan (3 or 4)” on page 35).
  8. Remove the plastic baffle.
  9. Remove the hard disk drive backplane (see “Hard disk drive backplane” on page 81).
  10. Disconnect the fan cable from the system board.



11. Press in the tabs ( **1** ) with the tip of a flat-blade screwdriver until the housing releases and tilts up ( **2** ); then, pull the housing out of the two notches on the front of the chassis and lift ( **3** ) the housing out of the server.

To install the blower housing, reverse the previous steps, making sure that the two tabs are inserted into the notches on the front of the chassis.

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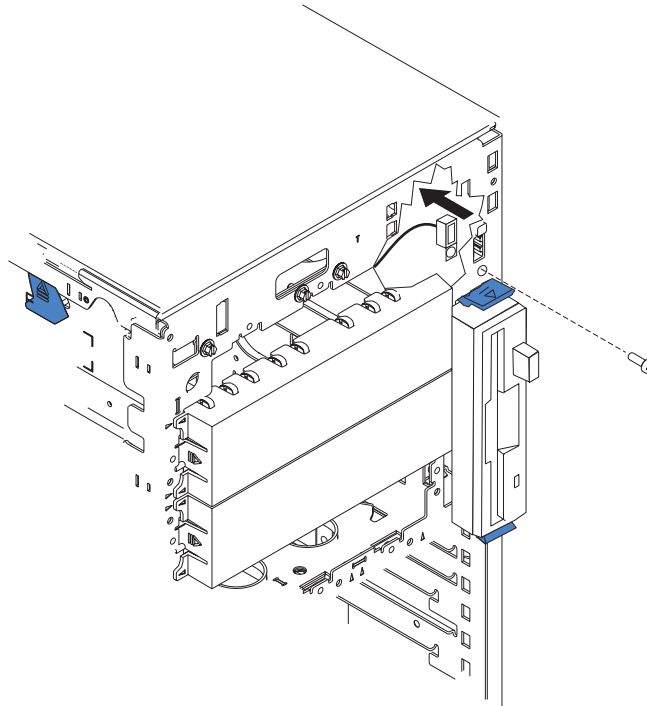
## Front USB connector assembly

Complete the following steps to remove the front USB connector.

**Note:**

- Read “Installation guidelines” on page 27 “Installation guidelines” on page 27.
  - Read Appendix B, “Safety information,” on page 151.
  - Read “Handling static-sensitive devices” on page 28.
1. Turn off the server.
  2. Disconnect all external cables and power cords from the back of the server.
  3. Remove the bezel (see “Removing the bezel” on page 32).
  4. Remove the server cover (see “Removing the left-side cover” on page 30).

5. Disconnect and remove adapters and spacers (see “Installing or replacing an adapter” on page 41).
6. Remove the central fan and adapter-support bracket (see “Center-fan and adapter-support bracket” on page 83).
7. Remove the air baffle.
8. Disconnect the front USB cable from the system board (J41).



9. Use a Phillips screwdriver to remove the mounting screw from the front of the server; then, remove the USB cable from the server.

To replace the front USB connector assembly, reverse the previous steps, threading the cable carefully.

---

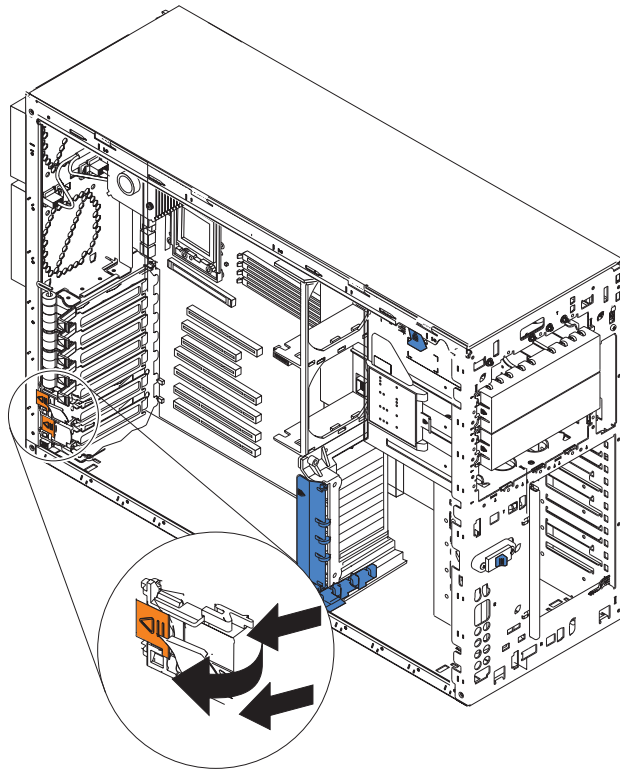
## Switch card assembly

Complete the following steps to remove the switch card assembly.

**Note:**

- Read “Installation guidelines” on page 27.
  - Read Appendix B, “Safety information,” on page 151.
  - Read “Handling static-sensitive devices” on page 28.
1. Turn off the server.
  2. Disconnect all external cables and power cords from the back of the server.
  3. Remove the server cover (see “Removing the left-side cover” on page 30).
  4. Remove all adapters and spacers (see “Installing or replacing an adapter” on page 41).
  5. Disconnect the switch card cable from the system board.





6. Press the two tabs on the switch card and remove it from the chassis.

**Note:** It might be easier to remove this component if the server is placed on its side.

To install the switch card assembly, line up the two tabs with the notches on the chassis and snap the assembly into place; then, connect the cable to the system board.

---

## System board

Complete the following steps to remove the system board.

**Note:**

- Read “Installation guidelines” on page 27.
- Read Appendix B, “Safety information,” on page 151.
- Read “Handling static-sensitive devices” on page 28.

1. Turn off the server and any attached devices.

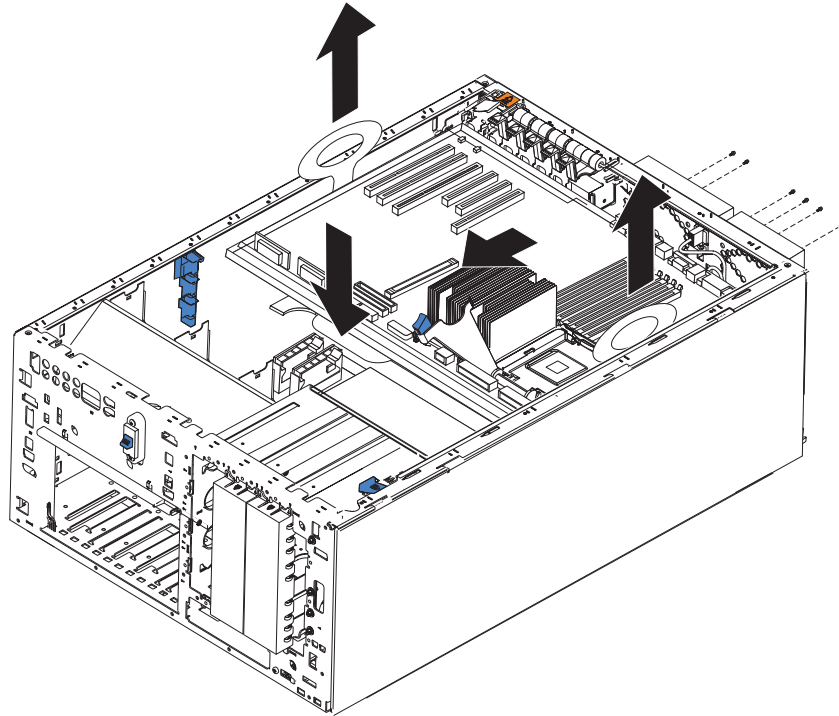
**Note:** When replacing the system board, you must either update the system with the latest firmware or restore the pre-existing firmware that the customer provides on a diskette or CD image.

2. Disconnect external cables and option cables from the back of the server.
3. Lay the server so that the cover is facing up.
4. Remove the left-side cover (see “Removing the left-side cover” on page 30).
5. Disconnect and remove adapters and spacers (see “Installing or replacing an adapter” on page 41).
6. Remove the center-fan and adapter support bracket (see “Center-fan and adapter-support bracket” on page 83).
7. Remove the air-baffle.
8. Disconnect all cables from the system board.

**Note:** Place all disconnected cables carefully to the side so that they do not come in contact with the center of the system board.

9. Remove all microprocessors and VRMs and set them aside on a static-protected surface for reinstallation (see “Microprocessor removal” on page 72).
10. Remove the memory modules and set them aside on a static-protected surface for reinstallation (see “Installing memory modules” on page 49).

**Note:** When you set the DIMMs aside, be sure to keep track of the slots they belong to; DIMMs must be installed in pairs of the same size, speed, type, and technology.



11. Push and hold the system-board release latch down; then, push the system board toward the front of the server.
12. Using the plastic handle on the system board, lift the right side (or PCI-X adapter side) of the system board partially out of the server.
13. Grasp the other plastic handle and carefully lift the system board out of the server.

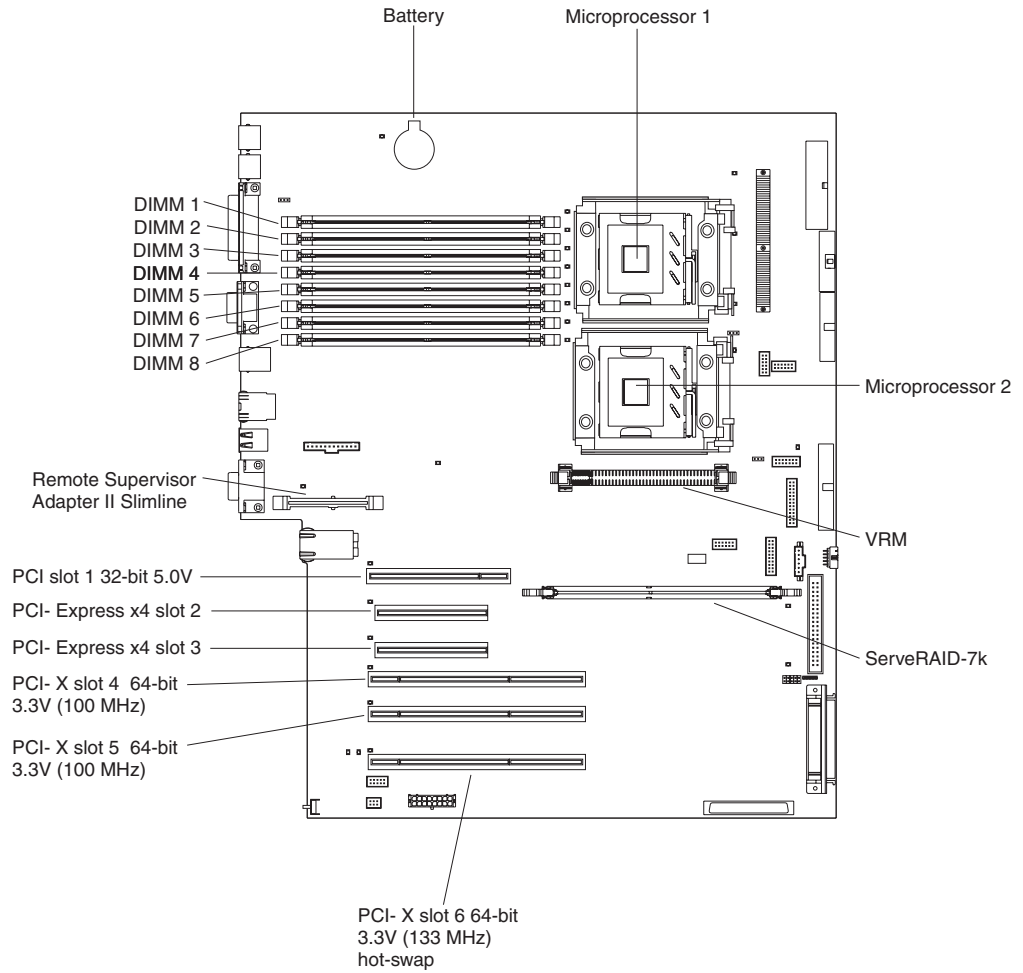
To reinstall the system board, complete the following steps:

1. Lower the left, or microprocessor, side of the system board into the server chassis first.; then, slide the system board to that side until it stops and lower the right or adapter side of the system board.
2. Slide the system board toward the rear of the server until it stops.
3. Reverse steps 5 on page 92 through 10 on page 92 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.

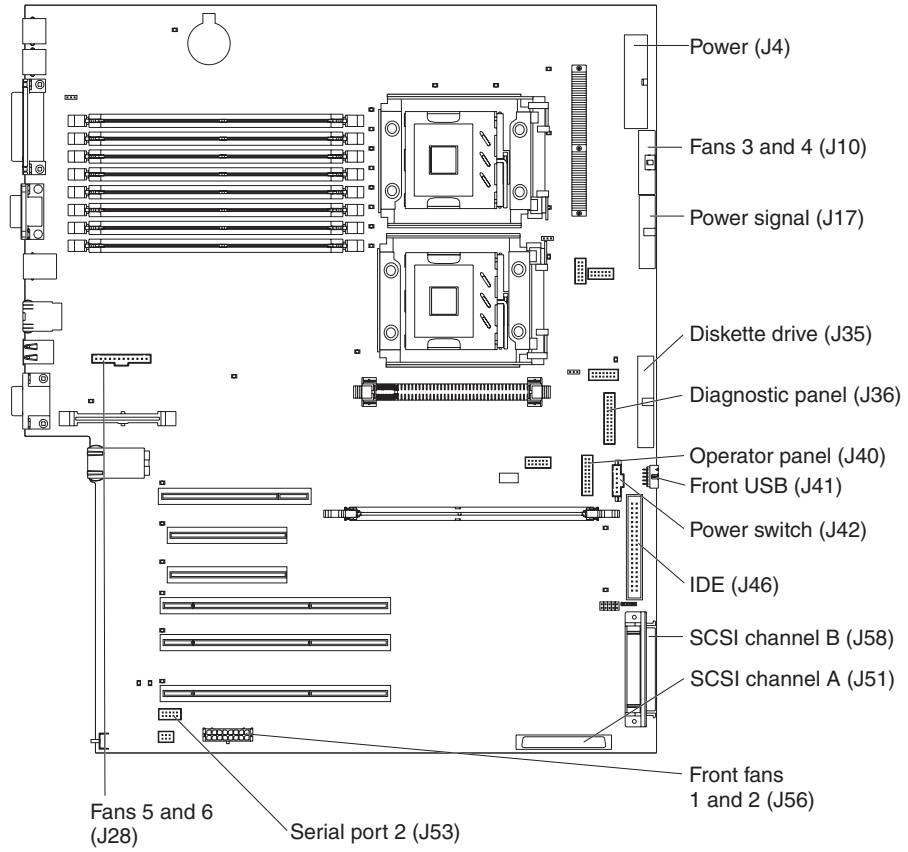
# System-board internal connectors

The following illustration shows the internal connectors on the system board.



# System-board internal cable connectors

The following illustration shows the internal connectors on the system board.



## System-board switches and jumpers

The following illustration shows the jumpers on the system board.

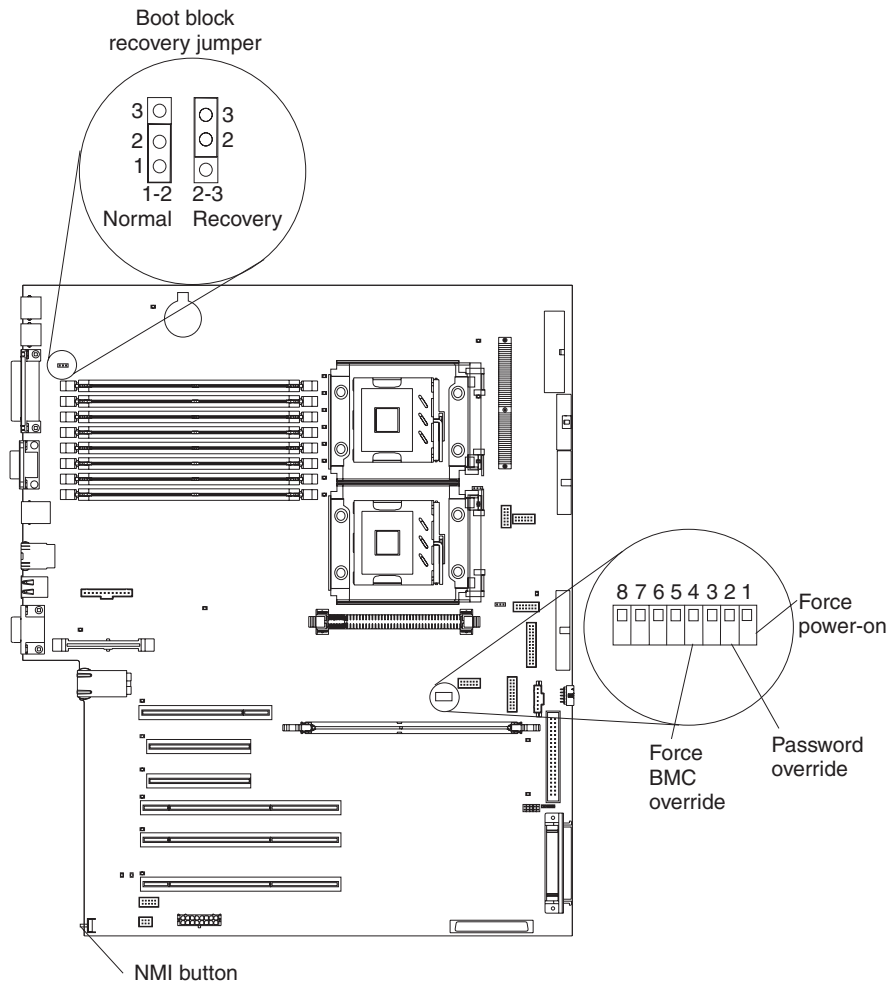


Table 5 describes the function of each switch on the switch block.

Table 5. Switches 1-8

Switch number	Default value	Switch description
8	Off	Reserved.
7	Off	Reserved.
6	Off	Reserved.
5	Off	Reserved.
4	Off	Force baseboard management controller (BMC) override.
3	Off	Reserved.

Table 5. Switches 1-8 (continued)

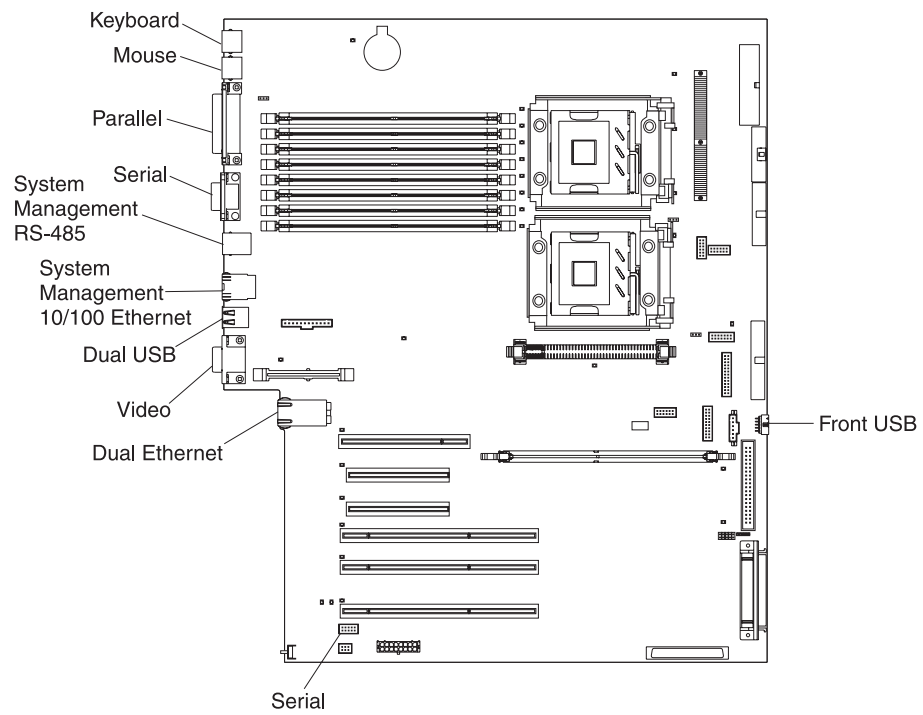
Switch number	Default value	Switch description
2	Off	<p>Power-on password override. Changing the position of this switch bypasses the power-on password check the next time the server is turned on and starts the Configuration/Setup Utility program so that you can change or delete the power-on password. Move the switch back to the default position after the password is overridden.</p> <p>Changing the position of this switch does not affect the administrator password check, if an administrator password is set.</p> <p>See the <i>User's Guide</i> on the IBM xSeries Documentation CD for additional information about the power-on password.</p>
1	Off	Force power-on. When toggled to On, this switch forces the server to turn on, overriding the power-on button.

**Notes:**

1. Before moving any jumpers, turn off the server; then, disconnect all power cords and external cables. (Review Appendix B, "Safety information," on page 151, "Installation guidelines" on page 27, and "Turning off the server" on page 8)
2. Any system-board switch or jumper blocks that are not shown in the illustrations in this document are reserved.

## System-board external connectors

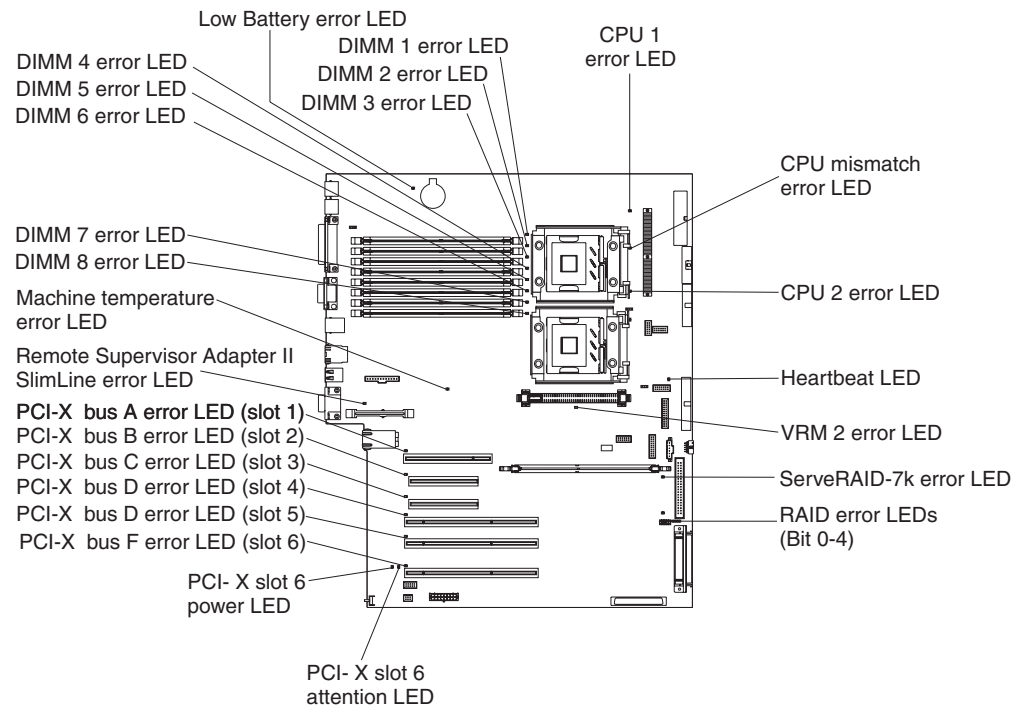
The following illustration shows the external input/output connectors on the system board.





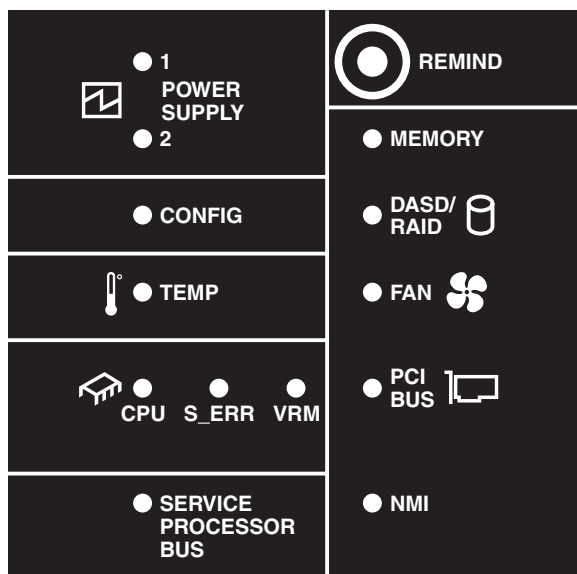
## System-board LEDs

The following illustration shows the light-emitting diodes (LEDs) on the system board.



## Light path diagnostics panel

The following illustration shows the remind button and the LEDs on the light path diagnostics panel. The light path diagnostics panel is inside the server under the left-side cover and the error LEDs are also visible through the left-side cover.



Use the remind button on the light path diagnostic panel to acknowledge that an error has occurred without taking further action. When you push the remind button, the system error LED will flash every 2 seconds until the error is fixed. If another error occurs, the system error LED will then stop flashing and return to a solid on state.

For more information about light path diagnostics, see “Light path diagnostics” on page 17.

The following table lists the light path diagnostics LEDs, the problems that they indicate, and actions to solve the problems.

LED	Problem	Action
POWER SUPPLY 1	Lit LED: Power supply 1 has failed.	<ol style="list-style-type: none"> <li>1. Remove ac power from the server.</li> <li>2. Replace the power supply; then, reconnect the server to ac power and restart the server.</li> </ol>
	Flashing LED: Power supply 1 was removed in a redundant power-supply configuration.	Install a new power supply in the PS1 location.
POWER SUPPLY 2	Lit LED: Power supply 2 has failed.	<ol style="list-style-type: none"> <li>1. Remove ac power from the server.</li> <li>2. Replace the power supply; then, reconnect the server to ac power and restart the server.</li> </ol>
	Flashing LED: Power supply 2 was removed in a redundant power supply configuration.	Install a new power supply in the PS2 location.
MEMORY	A memory error has occurred.	Replace the failing DIMM, indicated by the lit LED on the system board.
CONFIG	A configuration error has occurred.	Locate the second flashing LED and fix the configuration problem associated with the blinking LED.

LED	Problem	Action
DASD/RAID	A hard disk drive, integrated SCSI controller, or integrated RAID error has occurred. This LED will also be lit when a hard disk drive is removed from the server.	<ul style="list-style-type: none"> <li>• Check the LEDs on the hard disk drives and replace the indicated drive.</li> <li>• Check the LEDs on the system board and replace the indicated component.</li> <li>• If a hard disk drive LED remains lit after being replaced, call for service.</li> </ul>
TEMP	The system temperature has exceeded a threshold level.	<ul style="list-style-type: none"> <li>• Determine whether a fan has failed. If it has, replace it.</li> <li>• Make sure that the room temperature is not too high. See "Features and specifications" on page 5 of the <i>Installation Guide</i> for temperature information.</li> <li>• Make sure that the air vents are not blocked.</li> </ul> <p>If the problem remains, call for service.</p>
FAN	A fan has failed or is operating too slowly. A failing fan can also cause the TEMP LED to be lit.	Replace the failing fan, indicated by the lit LED.
CPU	A microprocessor has failed.	<p>If a lit LED on the system board indicates a problem with a microprocessor, make sure that the microprocessor is installed correctly.</p> <p>Replace the failing microprocessor.</p>
S_ERR	A soft error has occurred.	<ol style="list-style-type: none"> <li>1. Restart the server.</li> <li>2. Update the firmware and adapter drivers.</li> <li>3. Check the POST error log</li> </ol>
VRM	The VRM or integrated VRD has failed.	<ul style="list-style-type: none"> <li>• Remove ac power from the server, and then restart the server.</li> <li>• If the LED next to the VRM is lit, replace the pluggable VRM.</li> <li>• If the LED next to the integrated VRD is lit, replace the system board.</li> </ul>
PCI BUS	An error has occurred on a PCI bus.	<ul style="list-style-type: none"> <li>• Check the system error log for information about the error.</li> <li>• If you cannot isolate the failing adapter through the information in the system error log, remove one adapter at a time from the failing PCI bus, and restart the server after each adapter is removed.</li> </ul> <p>Replace the system board.</p>
SERVICE PROCESSOR BUS	The service processor has failed.	<p>Remove ac power from the server; then, reconnect the server to ac power and restart the server.</p> <p>Replace the failing service processor.</p>
NMI	A machine check error has occurred.	Check the error log to diagnose the condition.



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## Chapter 6. Symptom-to-FRU index

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This index supports xSeries 236 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 11.

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"> <li>• One beep</li> <li>• A pause (or break)</li> <li>• Two beeps</li> <li>• A pause (or break)</li> <li>• Three beeps</li> </ul>
4	Four continuous beeps

One beep after successfully completing POST indicates the system is functioning properly.

<b>Note:</b> See “System replaceable units” on page 142 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"> <li>1. <b>Optional microprocessor (if installed)</b></li> <li>2. Microprocessor</li> <li>3. System board</li> </ol>
1-1-3 (CMOS write/read test failed)	<ol style="list-style-type: none"> <li>1. <b>Battery</b></li> <li>2. System board</li> </ol>
1-1-4 (BIOS EEPROM checksum failed)	<ol style="list-style-type: none"> <li>1. <b>Recover BIOS</b></li> <li>2. System board</li> </ol>
1-2-1 (Programmable Interval Timer failed)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
1-2-2 (DMA initialization failed)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
1-2-3 (DMA page register write/read failed)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
1-2-4 (RAM refresh verification failed)	<ol style="list-style-type: none"> <li>1. <b>DIMM</b></li> <li>2. System board</li> </ol>
1-3-1 (first 64K RAM test failed)	<ul style="list-style-type: none"> <li>• <b>DIMM</b></li> </ul>
2-1-1 (Secondary DMA register failed)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
2-1-2 (Primary DMA register failed)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

<b>Beep/symptom</b>	<b>FRU/action</b>
<b>2-1-3</b> (Primary interrupt mask register failed)	• <b>System board</b>
<b>2-1-4</b> (Secondary interrupt mask register failed)	• <b>System board</b>
<b>2-2-1</b> (Interrupt vector loading failed)	• <b>System board</b>
<b>2-2-2</b> (Keyboard controller failed)	1. <b>System board</b> 2. Keyboard
<b>2-2-3</b> (CMOS power failure and checksum checks failed)	1. <b>Battery</b> 2. System board
<b>2-2-4</b> (CMOS configuration information validation failed)	1. <b>Battery</b> 2. System board
<b>2-3-1</b> (Screen initialization failed)	• <b>System board</b>
<b>2-3-2</b> (Screen memory failed)	• <b>System board</b>
<b>2-3-3</b> (Screen retrace failed)	• <b>System board</b>
<b>2-3-4</b> (Search for video ROM failed)	• <b>System board</b>
<b>2-4-1</b> (Video failed; system believed operable)	• <b>System board</b>
<b>3-1-1</b> (Timer tick interrupt failed)	• <b>System board</b>
<b>3-1-2</b> (Interval timer channel 2 failed)	• <b>System board</b>
<b>3-1-3</b> (RAM test failed above address OFFFFH)	1. <b>DIMM</b> 2. System board
<b>3-1-4</b> (Time-Of-Day clock failed)	1. <b>Battery</b> 2. System board
<b>3-2-1</b> (Serial port failed)	• <b>System board</b>
<b>3-2-2</b> (Parallel port failed)	• <b>System board</b>
<b>3-2-3</b> (Math coprocessor test failed)	1. <b>Microprocessor</b> 2. System board
<b>3-2-4</b> (Failure comparing CMOS memory size against actual)	1. <b>DIMM</b> 2. Battery

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Beep/symptom	FRU/action
<b>3-3-1</b> (Memory size mismatch occurred.)	<ol style="list-style-type: none"> <li><b>DIMM</b></li> <li>Battery</li> </ol>
<b>3-3-2</b> (Critical SMBUS error occurred)	<ol style="list-style-type: none"> <li><b>Disconnect the server power cord from outlet, wait 30 seconds and retry.</b></li> <li>System board.</li> <li>DIMMs.</li> <li>DASD backplane.</li> <li>Power supply.</li> <li>Power cage assembly, if installed.</li> <li>12C Cable.</li> </ol>
<b>3-3-3</b> (No operational memory in system) <b>Note:</b> 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 <b>Boot Fail Count</b> feature in the <b>Start Options</b> of the Configuration/Setup Utility is set to <b>Enabled</b> (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 <b>Disabled</b> to <b>Enabled</b> .	<ol style="list-style-type: none"> <li><b>Install or reseat the memory modules, and then do a 3 boot reset.</b></li> <li>DIMMs.</li> <li>System board.</li> </ol>
<b>4-4-4</b> (Optional system management adapter not installed in slot 1 or not functioning correctly)	<ol style="list-style-type: none"> <li><b>Verify that the adapter is installed in slot 1.</b></li> <li>Adapter.</li> <li>System board.</li> </ol>
<b>Two short beeps</b> (Information only, the configuration has changed)	<ol style="list-style-type: none"> <li><b>Run Diagnostics.</b></li> <li>Run the Configuration/Setup Utility program.</li> </ol>
<b>Three short beeps</b>	<ol style="list-style-type: none"> <li><b>DIMM</b></li> <li>System board</li> </ol>
<b>One continuous beep</b>	<ol style="list-style-type: none"> <li><b>Microprocessor</b></li> <li>Optional microprocessor (if installed)</li> <li>System board</li> </ol>
<b>Repeating short beeps</b>	<ol style="list-style-type: none"> <li><b>Keyboard</b></li> <li>System board</li> </ol>
<b>One long and one short beep</b>	<ol style="list-style-type: none"> <li><b>Video adapter (if installed)</b></li> <li>System board</li> </ol>
<b>One long and two short beeps</b>	<ol style="list-style-type: none"> <li><b>Video adapter (if installed)</b></li> <li>System board</li> </ol>
<b>One long and three short beeps</b>	<ol style="list-style-type: none"> <li><b>Monitor</b></li> <li>Video adapter, if installed</li> <li>System board</li> </ol>



**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Beep/symptom	FRU/action
Two long and two short beeps	<ul style="list-style-type: none"> <li>• Video adapter</li> </ul>

## No-beep symptoms

**Note:** See “System replaceable units” on page 142 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"> <li>1. Check speaker cables (if supported).</li> <li>2. Speaker (if supported).</li> <li>3. System board.</li> </ol>
No beeps occur after successfully completing POST (the power-on status is disabled)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program, and set the Start Options Power-On Status to Enable.</li> <li>2. Check the speaker connection (if supported).</li> <li>3. System board.</li> </ol>
No ac power (power supply ac LED is off)	<ol style="list-style-type: none"> <li>1. Check the power cord.</li> <li>2. Power supply. (If two are installed, swap them to determine if one is defective.)</li> <li>3. Power cage assembly.</li> <li>4. Hot-swap power ac inlet box.</li> </ol>
No beep and no video	<ul style="list-style-type: none"> <li>• See “Undetermined problems” on page 138.</li> </ul>
System will not start (power supply ac LED is on)	<ul style="list-style-type: none"> <li>• See “Power-supply LED errors” on page 115.</li> </ul>

## POST error codes

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

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>062</b> (Three consecutive startup failures using the default configuration.)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Battery.</li> <li>3. System board.</li> <li>4. Microprocessor.</li> </ol>
<b>101, 102</b> (System and processor error)	<ul style="list-style-type: none"> <li>• System board</li> </ul>
<b>106</b> (System and processor error)	<ul style="list-style-type: none"> <li>• System board</li> </ul>
<b>111</b> (Channel check error)	<ol style="list-style-type: none"> <li>1. Memory DIMM</li> <li>2. System board</li> </ol>
<b>114</b> (Adapter read-only memory error)	<ol style="list-style-type: none"> <li>1. Failing adapter.</li> <li>2. Run diagnostics.</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

<b>Error code/symptom</b>	<b>FRU/action</b>
<b>129</b> (Internal cache error)	<ol style="list-style-type: none"> <li>1. <b>Microprocessor</b></li> <li>2. Optional microprocessor (if installed)</li> </ol>
<b>151</b> (Real time clock error)	<ol style="list-style-type: none"> <li>1. <b>Battery</b></li> <li>2. System board</li> </ol>
<b>161</b> (Real time clock battery error)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. Battery.</li> <li>3. System board.</li> </ol>
<b>162</b> (Device configuration error) <b>Note:</b> Be sure to load the default settings and any additional desired settings; then, <i>save the configuration.</i>	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. Battery.</li> <li>3. Failing device.</li> <li>4. System board.</li> </ol>
<b>163</b> (Real-time clock error)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. Battery.</li> <li>3. System board.</li> </ol>
<b>164</b> (Memory configuration changed.)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. DIMM.</li> <li>3. System board.</li> </ol>
<b>175</b> (Hardware error)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
<b>176</b> (Computer cover or cable cover was removed without a key being used)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. System board.</li> </ol>
<b>177, 178</b> (Security hardware error)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. System board.</li> </ol>
<b>184</b> (Power-on password damaged)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. System board.</li> </ol>
<b>185</b> (Drive startup sequence information corrupted)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. System board.</li> </ol>
<b>186</b> (Security hardware control logic failed)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. System board.</li> </ol>
<b>187</b> (VPD serial number not set.)	<ol style="list-style-type: none"> <li>1. <b>Set serial number in the Configuration/Setup Utility program.</b></li> <li>2. System board.</li> </ol>
<b>188</b> (Bad EEPROM CRC #2)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. System board.</li> </ol>
<b>189</b> (An attempt was made to access the server with invalid passwords)	<ul style="list-style-type: none"> <li>• <b>Run the Configuration/Setup Utility program, and type the administrator password.</b></li> </ul>
<b>196, 198, 199</b> (Microprocessor mismatch)	<ol style="list-style-type: none"> <li>1. <b>Verify microprocessors are of same type and speed.</b></li> <li>2. Microprocessor.</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>201</b> (Memory test error.) If the server does not have the latest level of BIOS installed, update the BIOS to the latest level and run the diagnostic program again.	<ol style="list-style-type: none"> <li>1. <b>DIMM</b></li> <li>2. System board</li> </ol>
<b>229</b> (Cache error)	<ol style="list-style-type: none"> <li>1. <b>Microprocessor</b></li> <li>2. Optional microprocessor (if installed)</li> </ol>
<b>262</b> (DRAM parity configuration error)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. Battery.</li> <li>3. System board.</li> </ol>
<b>289</b> (DIMM disabled by POST or user)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program, if the DIMM was disabled by the user.</b></li> <li>2. Disabled DIMM, if not disabled by user.</li> </ol>
<b>301</b> (Keyboard or keyboard controller error)	<ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. System board</li> </ol>
<b>303</b> (Keyboard controller error)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
<b>602</b> (Invalid diskette boot record)	<ol style="list-style-type: none"> <li>1. <b>Diskette</b></li> <li>2. Diskette drive</li> <li>3. Cable</li> <li>4. System board</li> </ol>
<b>604</b> (Diskette drive error)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program and diagnostics.</b></li> <li>2. Diskette drive.</li> <li>3. Drive cable.</li> <li>4. System board.</li> </ol>
<b>605</b> (Unlock failure)	<ol style="list-style-type: none"> <li>1. <b>Diskette drive</b></li> <li>2. Drive cable</li> <li>3. System board</li> </ol>
<b>662</b> (Diskette drive configuration error)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program and diagnostics.</b></li> <li>2. Diskette drive.</li> <li>3. Drive cable.</li> <li>4. System board.</li> </ol>
<b>762</b> (Coprocessor configuration error)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. Battery.</li> <li>3. Microprocessor.</li> </ol>
<b>962</b> (Parallel port error)	<ol style="list-style-type: none"> <li>1. <b>Disconnect the external cable on the parallel port.</b></li> <li>2. Run the Configuration/Setup Utility program.</li> <li>3. System board.</li> </ol>
<b>11XX</b> (System board serial port 1 or 2 error)	<ol style="list-style-type: none"> <li>1. <b>Disconnect the external cable on the serial port.</b></li> <li>2. Run the Configuration/Setup Utility program.</li> <li>3. System board.</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>1301</b> (I <sup>2</sup> C cable to front panel not found)	<ol style="list-style-type: none"> <li>1. <b>Verify operator information panel cable is connected to J40 on system board.</b></li> <li>2. Cable.</li> <li>3. Front panel</li> <li>4. Power switch assembly</li> <li>5. System board</li> </ol>
<b>1302</b> (I <sup>2</sup> C cable from system board to power on and reset switches not found)	<ol style="list-style-type: none"> <li>1. <b>Verify power on and reset switch cable is connected to J42 on system board.</b></li> <li>2. Cable.</li> <li>3. Power switch assembly</li> <li>4. System board</li> </ol>
<b>1303</b> (I <sup>2</sup> C cable from system board to power backplane not found)	<ol style="list-style-type: none"> <li>1. <b>Cable</b></li> <li>2. Power cage assembly, if installed</li> <li>3. System board</li> </ol>
<b>1304</b> (I <sup>2</sup> C cable to diagnostic LED board not found)	<ol style="list-style-type: none"> <li>1. <b>Verify light path diagnostics panel cable is connected to J36 on system board.</b></li> <li>2. Power switch assembly.</li> <li>3. System board.</li> </ol>
<b>1600</b> (The system management processor is not functioning) Do the following before replacing a FRU: <ol style="list-style-type: none"> <li>1. Ensure that BMC reset switch is in the OFF position.</li> <li>2. Remove the ac power to the server, wait 20 seconds; then, reconnect the ac power. Wait 30 seconds; then, turn on the server.</li> </ol>	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
<b>1601</b> (The system is able to communicate to the system management processor, but the system management processor failed to respond at the start of POST.) Do the following before replacing a FRU: <ol style="list-style-type: none"> <li>1. Remove the ac power to the server, wait 20 seconds; then, reconnect the ac power. Wait 30 seconds; then, turn on the server.</li> <li>2. Flash update the system management processor.</li> </ol>	<ol style="list-style-type: none"> <li>1. <b>Remote Supervisor Adapter, if installed</b></li> <li>2. System board</li> </ol>
<b>1602</b> (Optional service processor not properly installed.)	Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry.

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>1762</b> (Hard disk configuration error)	<ol style="list-style-type: none"> <li>1. <b>Hard disk drive.</b></li> <li>2. Hard disk cables.</li> <li>3. Run the Configuration/Setup Utility program.</li> <li>4. Hard disk adapter.</li> <li>5. SCSI backplane.</li> <li>6. System board.</li> </ol>
<b>178X</b> (Fixed disk error)	<ol style="list-style-type: none"> <li>1. <b>Hard disk cables.</b></li> <li>2. Run diagnostics.</li> <li>3. Hard disk adapter.</li> <li>4. Hard disk drive.</li> <li>5. System board.</li> </ol>
<b>1800</b> (No more hardware interrupt available for PCI adapter)	<ol style="list-style-type: none"> <li>1. <b>Verify that all adapters are compatible.</b></li> <li>2. Run the Configuration/Setup Utility program.</li> <li>3. Failing adapter.</li> <li>4. System board.</li> </ol>
<b>1962</b> (Drive does not contain a valid boot sector)	<ol style="list-style-type: none"> <li>1. <b>Verify that a startable operating system is installed.</b></li> <li>2. Run diagnostics.</li> <li>3. Hard disk drive.</li> <li>4. SCSI backplane.</li> <li>5. Cable.</li> <li>6. System board.</li> </ol>
<b>2400</b> (Video controller test failure)	<ol style="list-style-type: none"> <li>1. <b>Video adapter (if installed)</b></li> <li>2. System board</li> </ol>
<b>2462</b> (Video memory configuration error)	<ol style="list-style-type: none"> <li>1. <b>Video adapter (if installed)</b></li> <li>2. System board</li> </ol>
<b>5962</b> (IDE CD-ROM drive configuration error)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. CD-ROM drive.</li> <li>3. CD-ROM power cable.</li> <li>4. IDE cable.</li> <li>5. System board.</li> <li>6. Battery.</li> </ol>
<b>8603</b> (Pointing-device error)	<ol style="list-style-type: none"> <li>1. <b>Pointing device</b></li> <li>2. If a KVM switch has been installed, make sure that it is pointing to the correct server and that it is functional.</li> <li>3. System board</li> </ol>
<b>0001200</b> (Machine check architecture error)	<ol style="list-style-type: none"> <li>1. <b>If possible, update BIOS code and service processor firmware.</b></li> <li>2. Microprocessor 1</li> <li>3. Optional microprocessor 2</li> </ol>
<b>00012000</b> (Microprocessor machine check)	<ol style="list-style-type: none"> <li>1. <b>If possible, update BIOS code and service processor firmware.</b></li> <li>2. Microprocessor</li> <li>3. System board</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>00019501</b> (Microprocessor 1 is not functioning - check VRM and microprocessor LEDs)	<ol style="list-style-type: none"> <li>1. <b>If possible, update BIOS code and service processor firmware.</b></li> <li>2. VRM 1</li> <li>3. Microprocessor 1</li> <li>4. System board</li> </ol>
<b>00019502</b> (Microprocessor 2 is not functioning - check VRM and microprocessor LEDs)	<ol style="list-style-type: none"> <li>1. <b>If possible, update BIOS code and service processor firmware.</b></li> <li>2. VRM 2</li> <li>3. Microprocessor 2</li> </ol>
<b>00019701</b> (Microprocessor 1 failed)	<ol style="list-style-type: none"> <li>1. <b>If possible, update BIOS code and service processor firmware.</b></li> <li>2. Microprocessor 1</li> <li>3. System board</li> </ol>
<b>00019702</b> (Microprocessor 2 failed)	<ol style="list-style-type: none"> <li>1. <b>If possible, update BIOS code and service processor firmware.</b></li> <li>2. Microprocessor 2</li> <li>3. System board</li> </ol>
<b>00180100</b> (A PCI adapter has requested memory resources that are not available.)	<ol style="list-style-type: none"> <li>1. <b>Reorder the adapters in the PCI slots. It is important that your startup device is positioned early in the startup-device order so that it is run by POST.</b></li> <li>2. Ensure that the PCI adapter and all other adapters are set correctly in the Configuration/Setup Utility program Utility program. If the memory resource settings are not correct, change the settings.</li> <li>3. If all memory resources are being used, you might need to remove an adapter to make memory available to the PCI adapter. Disabling the adapter BIOS on the adapter might correct the error. (See the documentation provided with the adapter.)</li> </ol>
<b>00180200</b> (No more I/O space available for PCI adapter)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. Failing adapter.</li> <li>3. System board.</li> </ol>
<b>00180300</b> (No more memory (above 1MB for PCI adapter))	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. Failing adapter.</li> <li>3. System board.</li> </ol>
<b>00180400</b> (No more memory (below 1MB for PCI adapter))	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. Move the failing adapter to slot 1.</li> <li>3. Failing adapter.</li> <li>4. System board.</li> </ol>
<b>00180500</b> (PCI option ROM checksum error)	<ol style="list-style-type: none"> <li>1. <b>Remove failing PCI card.</b></li> <li>2. System board.</li> </ol>
<b>00180600</b> (PCI to PCI bridge error)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program.</b></li> <li>2. Move the failing adapter to slot 1.</li> <li>3. Failing adapter.</li> <li>4. System board</li> </ol>
<b>00180700, 00180800</b> (General PCI error)	<ol style="list-style-type: none"> <li>1. <b>System board</b></li> <li>2. PCI card</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

<b>Error code/symptom</b>	<b>FRU/action</b>
<b>00181000</b> (PCI error)	<ul style="list-style-type: none"> <li>• <b>Adapter</b></li> <li>• System board</li> </ul>
<b>01295085</b> (ECC checking hardware test error)	<ol style="list-style-type: none"> <li>1. <b>System board</b></li> <li>2. Microprocessor</li> </ol>
<b>01298001</b> (System BIOS installed on this server does not support level of processor)	<ol style="list-style-type: none"> <li>1. <b>Ensure all microprocessors have the same cache size.</b></li> <li>2. Microprocessor 1.</li> </ol>
<b>01298002</b> (System BIOS installed on this server does not support level of processor)	<ol style="list-style-type: none"> <li>1. <b>Ensure all microprocessors have the same cache size.</b></li> <li>2. Microprocessor 2.</li> </ol>
<b>01298101</b> (System BIOS installed on this server does not support level of processor)	<ol style="list-style-type: none"> <li>1. <b>Ensure all microprocessors have the same cache size.</b></li> <li>2. Microprocessor 1.</li> </ol>
<b>01298102</b> (System BIOS installed on this server does not support level of processor)	<ol style="list-style-type: none"> <li>1. <b>Ensure all microprocessors have the same cache size.</b></li> <li>2. Microprocessor 2.</li> </ol>
<b>I9990301</b> (Hard disk sector error)	<ol style="list-style-type: none"> <li>1. <b>Hard disk drive</b></li> <li>2. SCSI backplane</li> <li>3. Cable</li> <li>4. System board</li> </ol>
<b>I9990305</b> (Hard disk sector error, no operating system installed)	<ol style="list-style-type: none"> <li>1. <b>Install operating system to hard disk.</b></li> </ol>
<b>I9990650</b> (AC power has been restored)	<ol style="list-style-type: none"> <li>1. <b>Check cable.</b></li> <li>2. Check for interruption of power.</li> <li>3. Power cable.</li> </ol>

## Light path diagnostic errors

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

<b>Diagnostics panel lit LED</b>	<b>FRU/action</b>
<b>PS 1</b> (power supply 1 failure or removal) <b>Note:</b> If this LED is blinking it indicates that power supply 1 has been removed in a redundant power supply configuration.	<ol style="list-style-type: none"> <li>1. <b>Power supply 1</b></li> <li>2. System board</li> </ol>
<b>PS 2</b> (power supply 2 failure or removal) <b>Note:</b> If this LED is blinking it indicates that power supply 2 has been removed in a redundant power supply configuration.	<ol style="list-style-type: none"> <li>1. <b>Power supply 2</b></li> <li>2. System board</li> </ol>
<b>CONFIG</b> (invalid configuration exists) <b>Note:</b> Check the panel for other lit LEDs.	<ol style="list-style-type: none"> <li>1. Run Configuration/Setup Utility program and make sure microprocessors and memory are configured correctly.</li> <li>2. Follow FRU/action for other lit LEDs or system-log errors.</li> <li>3. System board.</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Diagnostics panel lit LED	FRU/action
<b>NMI</b> (non-maskable interrupt occurred)	<ul style="list-style-type: none"> <li>• Check the system-error log and the BMC log for information about the error.</li> </ul>
<b>S_ERR</b> (soft error)	<ol style="list-style-type: none"> <li>1. Restart the server.</li> <li>2. Update firmware and adapter drivers.</li> <li>3. Check the POST error log for information.</li> <li>4. System board.</li> </ol>
<b>TEMP</b> (temperature exceeded a threshold level) <b>Note:</b> The FAN LED might also be lit.	<ol style="list-style-type: none"> <li>1. <b>Make sure that all fans are operating correctly.</b></li> <li>2. Ambient temperature must be within normal operating specifications; see “Features and specifications” on page 3.</li> <li>3. System board.</li> </ol>
<b>FAN</b> (a fan failed or is operating slowly) <b>Note:</b> The TEMP LED might also be lit.	<ol style="list-style-type: none"> <li>1. <b>Check individual fan LEDs.</b></li> <li>2. Failing fan.</li> <li>3. System board.</li> </ol>
<b>MEM</b> (memory failure (LED next to the failing DIMM is on))	<ol style="list-style-type: none"> <li>1. <b>Run Configuration/Setup Utility program and make sure DIMMs are correctly configured.</b></li> <li>2. Failing DIMM.</li> <li>3. System board</li> </ol>
<b>CPU</b> (microprocessor failure (LED next to the failing microprocessor is on))	<ol style="list-style-type: none"> <li>1. <b>Failing microprocessor</b></li> <li>2. System board</li> </ol>
<b>PCI</b> (PCI error; LED on system board at failing adapter will also be lit)	<ol style="list-style-type: none"> <li>1. <b>Failing adapter.</b></li> <li>2. System board.</li> </ol>
<b>VRM</b> (VRM or integrated VRD failed (LED next to the failing VRM is on))	<ol style="list-style-type: none"> <li>1. <b>Remove ac power from the server for 20 seconds, then reconnect power and restart the server.</b></li> <li>2. If LED next to VRM is lit, replace pluggable VRM.</li> <li>3. If LED next to integrated VRD is lit, replace the system board.</li> </ol>
<b>DASD /RAID</b> (hard disk drive failure (check drive LED) or RAID failure (check LEDs) <b>Note:</b> This LED will also be lit when a hard disk drive is removed from the server.	<ol style="list-style-type: none"> <li>1. <b>Be sure the fans are operating correctly and the airflow is good so that the drive is not overheating.</b></li> <li>2. Hard disk drive.</li> <li>3. SCSI backplane.</li> <li>4. System board.</li> </ol>
<b>SERVICE PROCESSOR BUS</b> (service processor error)	<ol style="list-style-type: none"> <li>1. <b>Remove ac power from the server for 20 seconds, then reconnect power and restart the server.</b></li> <li>2. System board.</li> </ol>
<b>EVENT LOG</b> (system warning has occurred)	<ul style="list-style-type: none"> <li>• <b>Check system-error log and BMC log for information about the error.</b></li> </ul>
<b>CPU/VRM mismatch</b> (microprocessor does not match VRM or VRD)	<ol style="list-style-type: none"> <li>1. <b>Install a matched microprocessor and VRM.</b></li> <li>2. System board</li> </ol>



## Power-supply LED errors

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

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

- Power supply
- Power cage assembly, if installed.
- System board (set switch 1 of SW1 to ON to bypass the power switch; see “System-board switches and jumpers” on page 96)

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

AC power LED	DC power LED	Description	FRU/action
Off	Off	No power to system or ac problem.	<ol style="list-style-type: none"> <li>1. <b>Check ac power to the system.</b></li> <li>2. Power supply.</li> </ol>
On	Off	Standby mode or dc problem.	<ol style="list-style-type: none"> <li>1. <b>Check system board power connector J4.</b> Move the Force power on switch (switch 1 on SW1) to ON to bypass power control. If the dc power LED is lit, press Ctrl+Alt+Delete. Watch the screen for any POST errors. Check the system-error log and BMC log for any listed problems. If the system starts with no errors:               <ol style="list-style-type: none"> <li>a. Power switch assembly</li> <li>b. System board</li> </ol> </li> <li>2. Remove the adapters and disconnect the cables and power connectors to all internal and external devices. Turn on the system. If the dc power LED is lit, replace the adapters and devices one at a time until you isolate the problem.</li> <li>3. Power supply.</li> <li>4. System board.</li> </ol>
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 142 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>001-250-000</b> (Failed processor board ECC)	<ul style="list-style-type: none"> <li>• <b>Microprocessor board</b></li> </ul>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

<b>Error code/symptom</b>	<b>FRU/action</b>
<b>001-292-000</b> (Core system: failed/CMOS checksum failed)	<ul style="list-style-type: none"> <li>• <b>Load BIOS defaults and rerun test.</b></li> </ul>
<b>001-XXX-000</b> (Failed core tests)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
<b>001-XXX-001</b> (Failed core tests)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
<b>005-XXX-000</b> (Failed video test)	<ol style="list-style-type: none"> <li>1. <b>Video adapter (if installed)</b></li> <li>2. System board</li> </ol>
<b>011-XXX-000</b> (Failed COM1 serial port test)	<ul style="list-style-type: none"> <li>• <b>Check loopback plug connected to externalized serial port.</b></li> <li>• Check cable from externalized port to system board.</li> </ul>
<b>011-XXX-001</b> (Failed COM2 serial port test)	<ul style="list-style-type: none"> <li>• <b>Check loopback plug connected to externalized serial port.</b></li> <li>• Check cable from externalized port to system board.</li> </ul>
<b>014-XXX-000</b> (Failed parallel port test)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
<b>015-XXX-001</b> (USB interface not found, board damaged)	<ol style="list-style-type: none"> <li>1. <b>System board</b></li> </ol>
<b>015-XXX-015</b> (Failed USB external loopback test)	<ol style="list-style-type: none"> <li>1. <b>Make sure the parallel port is not disabled.</b></li> <li>2. Run the USB external loopback test again.</li> <li>3. System board.</li> </ol>
<b>015-XXX-198</b> (Remote Supervisor Adapter II SlimLine installed) <i>or</i> (USB device connected during USB test)	<ol style="list-style-type: none"> <li>1. <b>If Remote Supervisor Adapter II SlimLine is installed as an option, remove it and rerun test.</b> <b>Note:</b> If Remote Supervisor Adapter II SlimLine is present as a standard installation, do not remove it; the test cannot be run.</li> <li>2. Remove USB devices and rerun test.</li> <li>3. System board.</li> </ol>
<b>020-XXX-000</b> (Failed PCI interface test)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
<b>020-XXX-001</b> (Failed hot-swap slot 1 PCI latch test)	<ol style="list-style-type: none"> <li>1. <b>PCI hot-swap latch assembly</b></li> <li>2. System board</li> </ol>
<b>020-XXX-002</b> (Failed Hot-swap slot 2 PCI latch test)	<ol style="list-style-type: none"> <li>1. <b>PCI hot-swap latch assembly</b></li> <li>2. System board</li> </ol>
<b>020-XXX-003</b> (Failed hot-swap slot 3 PCI latch test)	<ol style="list-style-type: none"> <li>1. <b>PCI hot-swap latch assembly</b></li> <li>2. System board</li> </ol>
<b>020-XXX-004</b> (Failed hot-swap slot 4 PCI latch test)	<ol style="list-style-type: none"> <li>1. <b>PCI hot-swap latch assembly</b></li> <li>2. System board</li> </ol>
<b>020-XXX-005</b> (Failed hot-swap slot 5 PCI latch test)	<ol style="list-style-type: none"> <li>1. <b>PCI hot-swap latch assembly</b></li> <li>2. System board</li> </ol>
<b>020-XXX-006</b> (Failed hot-swap slot 6 PCI latch test)	<ol style="list-style-type: none"> <li>1. <b>PCI hot-swap latch assembly</b></li> <li>2. System board</li> </ol>
<b>030-XXX-000</b> (Failed internal SCSI interface test)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>035-253-s99</b> (RAID adapter initialization failure)	<ol style="list-style-type: none"> <li>1. <b>ServeRAID adapter in slot s is not configured properly.</b> Obtain the basic and extended configuration status and see the <i>ServeRAID Hardware Maintenance Manual</i> for more information.</li> <li>2. Cable.</li> <li>3. SCSI backplane.</li> <li>4. Adapter.</li> </ol>
<b>035-XXX-099</b>	<ol style="list-style-type: none"> <li>1. <b>No adapters were found.</b></li> <li>2. If adapter is installed re-check connection.</li> </ol>
<b>035-XXX-s99</b> (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"> <li>1. <b>RAID adapter</b></li> <li>2. SCSI backplane</li> <li>3. Cable</li> </ol>
<b>035-XXX-snn</b> (Check System Error Log before replacing a FRU. s = number of failing PCI slot, nn = SCSI ID of failing fixed disk.)	<ul style="list-style-type: none"> <li>• <b>Hard disk drive with SCSI ID nn on RAID adapter in PCI slot s.</b></li> </ul>
<b>075-XXX-000</b> (Failed power supply test)	<ul style="list-style-type: none"> <li>• <b>Power supply</b></li> </ul>
<b>089-XXX-001</b> (Failed microprocessor test)	<ol style="list-style-type: none"> <li>1. <b>Microprocessor 1</b></li> <li>2. System board</li> </ol>
<b>089-XXX-002</b> (Failed optional microprocessor test)	<ol style="list-style-type: none"> <li>1. Optional microprocessor 2</li> <li>2. System board</li> </ol>
<b>166-051-000</b> System Management: Failed (Unable to communicate with RSA. It may be busy. Run the test again.)	<ol style="list-style-type: none"> <li>1. Flash latest levels of firmware (BIOS, service processor, diagnostics)</li> <li>2. Rerun diagnostic test.</li> <li>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.</li> <li>4. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry.</li> <li>5. Remote Supervisor Adapter II SlimLine.</li> </ol>
<b>166-060-000</b> System Management: Failed (Unable to communicate with RSA. It may be busy. Run the test again.)	<ol style="list-style-type: none"> <li>1. Flash latest levels of firmware (BIOS, service processor, diagnostics)</li> <li>2. Rerun diagnostic test.</li> <li>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.</li> <li>4. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry.</li> <li>5. Remote Supervisor Adapter II SlimLine.</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<p><b>166-070-000 System Management: Failed</b> (Unable to communicate with RSA. It may be busy. Run the test again.)</p>	<ol style="list-style-type: none"> <li>1. Flash latest levels of firmware (BIOS, service processor, diagnostics)</li> <li>2. Rerun diagnostic test.</li> <li>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.</li> <li>4. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry.</li> <li>5. Remote Supervisor Adapter II SlimLine.</li> </ol>
<p><b>166-198-000 System Management: Aborted</b> (Unable to communicate with RSA. It may be busy. Run the test again.)</p>	<ol style="list-style-type: none"> <li>1. <b>Run the diagnostic test again.</b></li> <li>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.</li> <li>3. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry.</li> <li>4. Remote Supervisor Adapter II SlimLine, if installed.</li> <li>5. System board.</li> </ol>
<p><b>166-260-000 System Management: Failed</b> (Restart RSA error. After restarting, RSA communication was lost. Unplug and cold boot to reset RSA.)</p>	<ol style="list-style-type: none"> <li>1. <b>Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry.</b></li> <li>2. Reseat the Remote Supervisor Adapter II SlimLine.</li> <li>3. Remote Supervisor Adapter II SlimLine.</li> </ol>
<p><b>166-342-000 System Management: Failed</b> (RSA adapter BIST indicate failed tests.)</p>	<ol style="list-style-type: none"> <li>1. <b>Ensure the latest firmware levels for Remote Supervisor Adapter II SlimLine and BIOS are installed.</b></li> <li>2. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry.</li> <li>3. Remote Supervisor Adapter II SlimLine.</li> </ol>
<p><b>166-400-000 System Management: Failed</b> (BMC self test result failed tests: x where x = Flash, RAM, or ROM.)</p>	<ol style="list-style-type: none"> <li>1. <b>Reflash or update firmware for BMC.</b></li> <li>2. System board.</li> </ol>
<p><b>166-404-001 System Management: Failed</b> (BMC indicates failure in I2C bus test.)</p>	<ol style="list-style-type: none"> <li>1. <b>Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry.</b></li> <li>2. Reflash or update firmware for BMC.</li> <li>3. Power backplane</li> <li>4. System board.</li> </ol>
<p><b>166-406-001 System Management: Failed</b> (BMC indicates failure in I2C bus test.)</p>	<ol style="list-style-type: none"> <li>1. <b>Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry.</b></li> <li>2. Reflash or update firmware for BMC.</li> <li>3. SCSI cable.</li> <li>4. SCSI backplane.</li> <li>5. System board.</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>166-407-001 System Management: Failed</b> (BMC indicates failure in I2C bus test.)	<ol style="list-style-type: none"> <li>1. <b>Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry.</b></li> <li>2. Reflash or update firmware for BMC.</li> <li>3. Operator information panel cable.</li> <li>4. Operator information panel.</li> <li>5. System board.</li> </ol>
<b>166-NNN-001 System Management: Failed</b> (BMC indicates failure in self test where NNN=300 to 320.)	<ol style="list-style-type: none"> <li>1. <b>Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry.</b></li> <li>2. Reflash or update firmware for BMC.</li> <li>3. System board.</li> </ol>
<b>166-NNN-001 System Management: Failed</b> (BMC indicates failure in I2C bus test where NNN=400 to 420 (excluding 412, 414, and 415).)	<ol style="list-style-type: none"> <li>1. <b>Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry.</b></li> <li>2. Reflash or update firmware for BMC.</li> <li>3. System board.</li> </ol>
<b>180-197-000</b> (SCSI ASPI driver not installed)	<ol style="list-style-type: none"> <li>1. <b>Remove RAID adapter, if installed, and rerun test.</b></li> <li>2. System board.</li> </ol>
<b>180-361-003</b> (Failed fan LED test)	<ol style="list-style-type: none"> <li>1. <b>Fan</b></li> <li>2. System board</li> </ol>
<b>180-XXX-000</b> (Diagnostics LED failure)	<ul style="list-style-type: none"> <li>• <b>Run diagnostics panel LED test for the failing LED.</b></li> </ul>
<b>180-XXX-001</b> (Failed front LED panel test)	<ol style="list-style-type: none"> <li>1. <b>Operator information card</b></li> <li>2. System board</li> </ol>
<b>180-XXX-002</b> (Failed diagnostics LED panel test)	<ol style="list-style-type: none"> <li>1. <b>Operator information card</b></li> <li>2. System board</li> </ol>
<b>180-XXX-003</b> (Failed system board LED test)	<ul style="list-style-type: none"> <li>• <b>System board</b></li> </ul>
<b>180-XXX-005</b> (Failed SCSI backplane LED test)	<ol style="list-style-type: none"> <li>1. <b>SCSI backplane</b></li> <li>2. SCSI backplane cable</li> <li>3. System board</li> </ol>
<b>201-XXX-0nn</b> (Failed memory test) <b>Note:</b> nn = slot number of failing DIMM; see “System-board internal connectors” on page 94.	<ol style="list-style-type: none"> <li>1. <b>DIMM nn</b></li> <li>2. System board</li> </ol>
<b>201-XXX-n99</b> (Multiple DIMM failure, see error text) <b>Note:</b> n = slot number of failing DIMM pair; see Table 2 on page 49.	<ol style="list-style-type: none"> <li>1. <b>See error text for failing DIMMs.</b></li> <li>2. System board.</li> </ol>
<b>202-XXX-001</b> (Failed system cache test)	<ol style="list-style-type: none"> <li>1. <b>Microprocessor 1</b></li> <li>2. System board</li> </ol>
<b>202-XXX-002</b> (Failed system cache test)	<ol style="list-style-type: none"> <li>1. <b>Microprocessor 2</b></li> <li>2. System board</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>206-XXX-000</b> (Failed diskette drive test)	<ol style="list-style-type: none"> <li>1. <b>Rerun the test with a different diskette.</b></li> <li>2. Make sure that the distance between monitors and diskette drives is at least 76 mm (3 in.).</li> <li>3. Diskette drive cables.</li> <li>4. Diskette drive.</li> <li>5. System board.</li> </ol>
<b>215-XXX-000</b> (Failed IDE CD-ROM drive test)	<ol style="list-style-type: none"> <li>1. <b>Rerun the test with a different CD-ROM.</b></li> <li>2. CD-ROM drive cables.</li> <li>3. CD-ROM drive.</li> <li>4. System board.</li> </ol>
<b>217-198-XXX</b> (Could not establish drive parameters)	<ol style="list-style-type: none"> <li>1. <b>Check cable and termination.</b></li> <li>2. Hard disk drive backplane.</li> <li>3. Hard disk drive.</li> </ol>
<b>217-XXX-000</b> (Failed hard disk drive test) <b>Note:</b> If RAID is configured, the hard disk drive number refers to the RAID logical array.	<ul style="list-style-type: none"> <li>• <b>Hard disk drive 1</b></li> </ul>
<b>217-XXX-001</b> (Failed hard disk test) <b>Note:</b> If RAID is configured, the hard disk number refers to the RAID logical array.	<ul style="list-style-type: none"> <li>• <b>Hard disk drive 2</b></li> </ul>
<b>217-XXX-002</b> (Failed hard disk test) <b>Note:</b> If RAID is configured, the hard disk number refers to the RAID logical array.	<ul style="list-style-type: none"> <li>• <b>Hard disk drive 3</b></li> </ul>
<b>217-XXX-003</b> (Failed hard disk test) <b>Note:</b> If RAID is configured, the hard disk number refers to the RAID logical array.	<ul style="list-style-type: none"> <li>• <b>Hard disk drive 4</b></li> </ul>
<b>217-XXX-004</b> (Failed hard disk test) <b>Note:</b> If RAID is configured, the hard disk number refers to the RAID logical array.	<ul style="list-style-type: none"> <li>• <b>Hard disk drive 5</b></li> </ul>
<b>217-XXX-005</b> (Failed hard disk test) <b>Note:</b> If RAID is configured, the hard disk number refers to the RAID logical array.	<ul style="list-style-type: none"> <li>• <b>Hard disk drive 6</b></li> </ul>
<b>264-XXX-0NN</b> (Failed tape drive test)	<ol style="list-style-type: none"> <li>1. <b>Tape cartridge, if user executed the Read/Write Tape Drive test (failure code of xxx = 256)</b></li> <li>2. SCSI or power cable connected to tape drive with SCSI ID <i>nn</i></li> <li>3. Tape drive with SCSI ID <i>nn</i> (refer to the Help and Service Information appendix of the tape drive’s User Guide)</li> <li>4. System board or SCSI controller (run SCSI controller diagnostic to determine if the SCSI bus is functioning properly.)</li> </ol>

<b>Note:</b> See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.	
<b>Error code/symptom</b>	<b>FRU/action</b>
<b>264-XXX-999</b> (Errors on multiple tape drives, see error text for more info)	<ul style="list-style-type: none"> <li>• <b>See error messages/text in the PC Doctor error log for detailed information on each individual tape drive error.</b></li> </ul>
<b>301-XXX-000</b> (Failed keyboard test)	<ul style="list-style-type: none"> <li>• <b>Keyboard</b></li> <li>• System board.</li> </ul>
<b>405-XXX-000</b> (Failed Ethernet test on controller on the system board)	<ol style="list-style-type: none"> <li>1. <b>Verify that Ethernet is not disabled in BIOS.</b></li> <li>2. System board.</li> </ol>
<b>405-XXX-00n</b> (Failed Ethernet test on adapter in PCI slot <i>n</i> )	<ol style="list-style-type: none"> <li>1. <b>Adapter in PCI slot <i>n</i></b></li> <li>2. System board</li> </ol>
<b>415-XXX-000</b> (Failed Modem test)	<ol style="list-style-type: none"> <li>1. <b>Cable</b> <b>Note:</b> Ensure modem is present and attached to server.</li> <li>2. Modem</li> <li>3. System board</li> </ol>

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## 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:

1. Remove the software or device that you just added.
2. Run the diagnostic tests to determine whether the server is running correctly.
3. 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

<b>Note:</b> See “System replaceable units” on page 142 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"> <li><b>Verify that:</b> <ul style="list-style-type: none"> <li>The IDE channel to which the CD-ROM drive is attached (primary or secondary) is enabled in the Configuration/Setup Utility program.</li> <li>All cables and jumpers are installed correctly.</li> <li>The correct device driver is installed for the CD-ROM drive.</li> </ul> </li> <li>Run CD-ROM drive diagnostics.</li> <li>CD-ROM drive.</li> </ol>
CD is not working properly.	<ol style="list-style-type: none"> <li><b>Clean the CD.</b></li> <li>Run CD-ROM diagnostics.</li> <li>CD-ROM drive.</li> </ol>
CD-ROM drive tray is not working. (The server must be powered on.)	<ol style="list-style-type: none"> <li><b>Insert the end of a paper clip into the manual tray-release opening.</b></li> <li>Run CD-ROM diagnostics.</li> <li>CD-ROM drive.</li> </ol>

## Diskette drive error symptoms

<b>Note:</b> See “System replaceable units” on page 142 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"> <li><b>If there is a diskette in the drive, verify that:</b> <ul style="list-style-type: none"> <li>The diskette drive is enabled in the Configuration/Setup utility program.</li> <li>The diskette is good and not damaged. (Try another diskette if you have one.)</li> <li>The diskette is inserted correctly in the drive.</li> <li>The diskette contains the necessary files to start the server.</li> <li>The software program is working properly.</li> <li>The cable is installed correctly (in the proper orientation).</li> </ul> </li> <li>To prevent diskette drive read/write errors, make sure that the distance between monitors and diskette drives is at least 76 mm (3 in.).</li> <li>Run diskette drive diagnostics.</li> <li>Cable.</li> <li>Diskette drive.</li> <li>System board.</li> </ol>

## General error symptoms

<b>Note:</b> See “System replaceable units” on page 142 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"> <li><b>Broken CRU/FRU</b></li> </ul>



## Hard disk drive error symptoms

<b>Note:</b> See “System replaceable units” on page 142 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"> <li>1. <b>Remove the first drive not recognized and try the hard disk drive diagnostic test again.</b></li> <li>2. If the remaining drives are recognized, replace the drive you removed with a new one.</li> </ol>
System stops responding during hard disk drive diagnostic test.	<ol style="list-style-type: none"> <li>1. <b>Remove the hard disk drive being tested when the server stopped responding and try the diagnostic test again.</b></li> <li>2. If the hard disk drive diagnostic test runs successfully, replace the drive you removed with a new one.</li> </ol>

## Intermittent error symptoms

<b>Note:</b> See “System replaceable units” on page 142 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"> <li>1. <b>Verify that:</b> <ul style="list-style-type: none"> <li>• All cables and cords are connected securely to the rear of the server and attached options.</li> <li>• 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.</li> <li>• Ensure that the SCSI bus and devices are configured correctly and that the last external device in each SCSI chain is terminated correctly.</li> </ul> </li> <li>2. Check the system-error log and BMC log.</li> </ol>

## Keyboard, mouse, or pointing device error symptoms

<b>Note:</b> See “System replaceable units” on page 142 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"> <li>1. <b>Verify that:</b> <ul style="list-style-type: none"> <li>• The keyboard cable is securely connected to the system, and the keyboard and mouse cables are not reversed.</li> <li>• The server and the monitor are turned on.</li> </ul> </li> <li>2. If a KVM switch is present, make sure that it is switched to this server.</li> <li>3. Keyboard.</li> <li>4. System board.</li> </ol>
The mouse or pointing device does not work.	<ol style="list-style-type: none"> <li>1. <b>Verify that:</b> <ul style="list-style-type: none"> <li>• The mouse or pointing-device cable is securely connected, and that the keyboard and mouse cables are not reversed.</li> <li>• The mouse device drivers are installed correctly.</li> </ul> </li> <li>2. If a KVM switch is present, make sure that it is switched to this server.</li> <li>3. Mouse or pointing device.</li> <li>4. System board.</li> </ol>

## Memory error symptoms

**Note:** See “System replaceable units” on page 142 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"> <li>1. <b>Verify that:</b> <ul style="list-style-type: none"> <li>• The memory modules are seated properly.</li> <li>• You have installed the correct type of memory.</li> <li>• If you changed the memory, you updated the memory configuration with the Configuration/Setup Utility program.</li> <li>• 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.</li> </ul> </li> <li>2. Check POST error log for error message 289:           <ul style="list-style-type: none"> <li>• If the DIMM was disabled by a system-management interrupt (SMI), replace the DIMM.</li> <li>• If the DIMM was disabled by the user or by POST:               <ol style="list-style-type: none"> <li>a. Start the Configuration/Setup Utility program.</li> <li>b. Enable the DIMM.</li> <li>c. Save the configuration and restart the server.</li> </ol> </li> </ul> </li> <li>3. DIMM.</li> <li>4. System board.</li> </ol>

## Microprocessor error symptoms

**Note:** See “System replaceable units” on page 142 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"> <li>1. <b>Verify that the startup microprocessor is seated properly.</b></li> <li>2. Startup microprocessor.</li> </ol>

## Monitor error symptoms

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
Monitor problems (general).	<p><b>Some IBM monitors have their own self-tests.</b> 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"> <li>1. Monitor.</li> <li>2. Run video diagnostics. If diagnostics pass, the problem may be a video driver.</li> <li>3. Display adapter / system board.</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
The screen is blank.	<p>1. <b>Verify that:</b></p> <ul style="list-style-type: none"> <li>• The server power cord is connected to the server and a working electrical outlet.</li> <li>• The monitor cables are connected properly.</li> <li>• The monitor is turned on and the brightness and contrast controls are adjusted correctly.</li> <li>• If the servers are C2T chained together, verify that: <ul style="list-style-type: none"> <li>– The C2T chain cables are securely connected to the servers.</li> <li>– The C2T breakout cable is connected properly.</li> <li>– A server that is turned on is selected.</li> </ul> </li> </ul> <p><b>Important:</b> 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 <b>Boot Fail Count</b> feature in the Start Options of the Configuration/Setup Utility program is set to <b>Enabled</b> (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 SlimLine in the server, make sure that the video cable is connected to the Remote Supervisor Adapter II SlimLine.</p> <p>2. Verify that the memory is installed (see “Installing memory modules” on page 49) and configured (see “Starting the Configuration/Setup Utility program” on page 9) correctly.</p> <p>3. Make sure that damaged BIOS code is not affecting the video; see “Recovering the BIOS code” on page 21.</p> <p>4. If you have verified these items and the screen remains blank, replace:</p> <ol style="list-style-type: none"> <li>a. Monitor</li> <li>b. Video adapter, if installed</li> <li>c. System board</li> </ol>
Only the cursor appears.	<ul style="list-style-type: none"> <li>• <b>See “Undetermined problems” on page 138</b></li> </ul>
The monitor works when you turn on the server but goes blank when you start some application programs.	<p>1. <b>Verify that:</b></p> <ul style="list-style-type: none"> <li>• The application program is not setting a display mode higher than the capability of the monitor.</li> <li>• The primary monitor cable is connected to the C2T device breakout cable.</li> <li>• You installed the necessary device drivers for the applications.</li> </ul> <p>2. If you have verified these items and the screen remains blank, replace the monitor.</p>

<b>Note:</b> See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.	
Symptom	FRU/action
The screen is wavy, unreadable, rolling, distorted, or has screen jitter.	<ol style="list-style-type: none"> <li><b>If the monitor self-tests show the monitor is working properly, consider the location of the monitor.</b> 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.  <b>Notes:</b> <ol style="list-style-type: none"> <li>To prevent diskette drive read/write errors, make sure that the distance between monitors and diskette drives is at least 76 mm (3 in.).</li> <li>Non-IBM monitor cables might cause unpredictable problems.</li> <li>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.</li> </ol> </li> <li>Video adapter, if installed.</li> <li>System board.</li> </ol>
Wrong characters appear on the screen.	<ol style="list-style-type: none"> <li><b>If the wrong language is displayed, update the BIOS code with the correct language.</b></li> <li>Video adapter, if installed.</li> <li>System board.</li> </ol>
No video.	<b>Make sure that all cables are connected correctly and securely.</b> If you have installed a Remote Supervisor Adapter II SlimLine in the server, make sure that the video cable is connected to the Remote Supervisor Adapter II SlimLine.

## Option error symptoms

<b>Note:</b> See “System replaceable units” on page 142 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"> <li><b>Verify that:</b> <ul style="list-style-type: none"> <li>The option is designed for the server (see the ServerProven® list at <a href="http://www.ibm.com/pc/compat/">http://www.ibm.com/pc/compat/</a>).</li> <li>You followed the installation instructions that came with the option.</li> <li>The option is installed correctly.</li> <li>You have not loosened any other installed options or cables.</li> <li>You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration.</li> </ul> </li> <li>Option you just installed.</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
An IBM option that used to work does not work now.	<ol style="list-style-type: none"> <li>1. <b>Verify that all of the option hardware and cable connections are secure.</b></li> <li>2. If the option comes with its own test instructions, use those instructions to test the option.</li> <li>3. If the failing option is a SCSI option, verify that:               <ul style="list-style-type: none"> <li>• The cables for all external SCSI options are connected correctly.</li> <li>• The last option in each SCSI chain, or the end of the SCSI cable, is terminated correctly.</li> <li>• Any external SCSI option is turned on. You must turn on an external SCSI option before turning on the server.</li> </ul> </li> <li>4. Failing option.</li> </ol>

## Power error symptoms

**Note:** See “System replaceable units” on page 142 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"> <li>1. <b>Reseat the connector.</b></li> <li>2. Power switch card.</li> <li>3. System board.</li> </ol>
The server does not turn on.	<ol style="list-style-type: none"> <li>1. <b>Verify that:</b> <ul style="list-style-type: none"> <li>• The power cables are properly connected to the server.</li> <li>• The power supply LEDs indicate correct operation (see “Power-supply LED errors” on page 115).</li> <li>• The electrical outlet functions properly.</li> <li>• The type of memory installed is supported by the server, and that functional DIMMs are installed in slots 1 and 2.</li> <li>• 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.</li> </ul> </li> <li>2. If LEDs for microprocessors or VRMs are on, verify that:               <ol style="list-style-type: none"> <li>a. A VRM is installed if a second microprocessor is present.</li> <li>b. All microprocessors have the same speed.</li> </ol> </li> <li>3. Override front panel power button:               <ol style="list-style-type: none"> <li>a. Disconnect server power cords.</li> <li>b. Move the force power-on password switch (SW1) from its upward position to its lower position.</li> <li>c. Reconnect power cords.</li> </ol> <p>If server turns on:</p> <ol style="list-style-type: none"> <li>a. Service processor (baseboard management controller) error.</li> <li>b. Operator information card.</li> </ol> <p>If server does not turn on:</p> <ul style="list-style-type: none"> <li>• System board</li> </ul> </li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
The server does not turn off.	<ol style="list-style-type: none"> <li>1. <b>Verify whether you are using an ACPI or non-ACPI operating system.</b> If you are using a non-ACPI operating system:               <ol style="list-style-type: none"> <li>a. Press Ctrl+Alt+Delete.</li> <li>b. Turn off the system by holding the power-control button for 4 seconds.</li> <li>c. If server fails during BIOS POST and power-control button does not work, remove the AC power cord.</li> </ol> </li> <li>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-click on the HAL.dll file name → choose <b>Properties</b> → select <b>Version</b> tab → click <b>Internal Name</b>.</li> </ol>

## Serial port error symptoms

**Note:** See “System replaceable units” on page 142 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"> <li>1. <b>Verify that:</b> <ul style="list-style-type: none"> <li>• Each port is assigned a unique address by the Configuration/Setup Utility program and none of the serial ports is disabled.</li> <li>• The serial-port adapter, if you installed one, is seated properly.</li> </ul> </li> <li>2. Failing serial port adapter.</li> </ol>
A serial device does not work.	<ol style="list-style-type: none"> <li>1. <b>Verify that:</b> <ul style="list-style-type: none"> <li>• The device is compatible with the server.</li> <li>• The serial port is enabled and is assigned a unique address.</li> <li>• The device is connected to the correct port (see “Input/output connectors” on page 67).</li> </ul> </li> <li>2. Failing serial device.</li> <li>3. Serial adapter, if installed.</li> <li>4. System board.</li> </ol>

## ServerGuide error symptoms

For the latest version of ServerGuide, go to <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-4ZKPPT>.

<b>Note:</b> See “System replaceable units” on page 142 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"> <li>• <b>Verify that the server is supported and has a startable (bootable) CD-ROM drive.</b></li> <li>• If the startup (boot) sequence settings have been altered, ensure that the CD-ROM drive is first in the startup sequence.</li> <li>• 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.</li> </ul>
The SCSI RAID program cannot view all installed drives, or the NOS cannot be installed.	<ul style="list-style-type: none"> <li>• <b>Verify that there are no duplicate SCSI IDs or IRQ assignments.</b></li> <li>• Verify that the hard disk drive is connected properly.</li> </ul>
The operating system installation program continuously loops.	<ul style="list-style-type: none"> <li>• <b>Make more space available on the hard disk.</b></li> </ul>
The ServerGuide program will not start the operating-system CD.	<ul style="list-style-type: none"> <li>• <b>Verify that the operating-system CD you have is supported by the ServerGuide program.</b> See the <i>ServerGuide Setup and Installation</i> CD label for a list of supported operating system versions.</li> </ul>
The operating system cannot be installed; the option is not available.	<ul style="list-style-type: none"> <li>• <b>Verify that the operating system is supported on the server.</b> 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.</li> </ul>

## Software error symptoms

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Symptom	FRU/action
Suspected software problem.	<ol style="list-style-type: none"> <li> <b>To determine if problems are caused by the software, verify that:</b> <ul style="list-style-type: none"> <li>The server has the minimum memory needed to use the software. For memory requirements, see the information that comes with the software.                             <b>Note:</b> If you have just installed an adapter or memory, you might have a memory address conflict.</li> <li>The software is designed to operate on the server.</li> <li>Other software works on the server.</li> <li>The software that you are using works on another system.</li> </ul> <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> </li> <li>If you have verified these items and the problem remains, contact the place of purchase.</li> </ol>

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## 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 “Viewing error logs from the diagnostic programs” on page 14.

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## SCSI error codes

Error code	FRU/action
<p><b>All SCSI Errors</b> One or more of the following might be causing the problem:</p> <ul style="list-style-type: none"> <li>A failing SCSI device (adapter, drive, controller)</li> <li>An improper SCSI configuration or SCSI termination jumper setting</li> <li>Duplicate SCSI IDs in the same SCSI chain</li> <li>A missing or improperly installed SCSI terminator</li> <li>A defective SCSI terminator</li> <li>An improperly installed cable</li> <li>A defective cable</li> </ul>	<ol style="list-style-type: none"> <li><b>External SCSI devices must be turned on before you turn on the server.</b></li> <li>Make sure that the cables for all external SCSI devices are connected correctly.</li> <li>If you have attached an external SCSI device to the server, make sure the external SCSI termination is set to automatic.</li> <li>Make sure that the last device in each SCSI chain is terminated correctly.</li> <li>Make sure that the SCSI devices are configured correctly.</li> </ol>



## ServeRAID error codes

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

For more information about ServeRAID errors, see the *IBM ServeRAID: User's Reference*.

<b>Note:</b> See "System replaceable units" on page 142 to determine which components should be replaced by a field service technician.	
<b>Error code/symptom</b>	<b>FRU/action</b>
1xxx to 7xxx (POST detected an internal error)	<ol style="list-style-type: none"> <li>1. Install download jumpers, flash latest level BIOS and firmware for controller, then remove jumpers.</li> <li>2. ServeRAID controller.</li> </ol>
2601 to 260B (POST detected an error with the ServeRAID subsystem)	<ol style="list-style-type: none"> <li>1. Install download jumpers, flash latest level BIOS and firmware for controller, then remove jumpers.</li> <li>2. ServeRAID controller.</li> </ol>
2610 (POST detected an error with the ServeRAID controller hardware)	<ol style="list-style-type: none"> <li>1. Install download jumpers, flash latest level BIOS and firmware for controller, then remove jumpers.</li> <li>2. ServeRAID controller.</li> </ol>
2620 (POST detected that a ServeRAID configuration or hard disk error occurred)	<ol style="list-style-type: none"> <li>1. Start the IBM ServeRAID Support CD and view the existing device and configuration information for your ServeRAID subsystem.</li> <li>2. Install download jumpers, flash latest level BIOS and firmware for controller, then remove jumpers.</li> <li>3. ServeRAID controller.</li> </ol>
3E20H (POST detected that the ServeRAID controller is in the wrong PCI expansion slot)	<ol style="list-style-type: none"> <li>1. Install the ServeRAID controller in the correct PCI expansion slot; see the documentation that came with your server for more information.</li> <li>2. Install download jumpers, flash latest level BIOS and firmware for controller, then remove jumpers.</li> <li>3. ServeRAID controller.</li> </ol>
3E21H (POST detected that the ServeRAID controller did not find the integrated SCSI controller)	<ol style="list-style-type: none"> <li>1. Make sure the ServeRAID controller is in the correct PCI expansion slot; see the documentation that came with the server for more information.</li> <li>2. Install download jumpers, flash latest level BIOS and firmware for controller, then remove jumpers.</li> <li>3. ServeRAID controller.</li> </ol>
3E2xH (POST detected an error with the integrated SCSI controller: either the wrong controller was found or some other SCSI controller error occurred)	<ol style="list-style-type: none"> <li>1. Install download jumpers, flash latest level BIOS and firmware for controller, then remove jumpers.</li> <li>2. ServeRAID controller.</li> </ol>
8xxx to Bxxx (POST detected an error with the SCSI interface)	<ol style="list-style-type: none"> <li>1. Verify that the SCSI cables are correctly connected and the SCSI termination is set properly for each installed SCSI device.</li> <li>2. Install download jumpers, flash latest level BIOS and firmware for controller, then remove jumpers.</li> <li>3. ServeRAID controller.</li> </ol>

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## 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 131.

**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 are not supported on this server.

Table 6. SCSI identifier

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

Table 6. SCSI identifier (continued)

SCSI Channel Code (z)	Descriptions
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 132 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 132.
- f. Disconnect one drive at a time attached to the channel identified in step 2a on page 132; 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 and reboot each time to determine which drive is causing the problem.
- d. Replace SCSI cable attached to channel identified in step 2a.
- e. Replace backplane attached to channel identified in step 2a.
3. If original ISPR code is still present after disconnecting all SCSI cables and rebooting, perform the following actions until the error is no longer present:
  - Reseat the controller
  - Replace the controller

## Temperature error messages

<b>Note:</b> See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.	
Message	Action
<b>DASD Over Temperature</b> (level-critical; direct access storage device bay x was over temperature)	<ul style="list-style-type: none"> <li>• <b>Ensure that the system is being properly cooled;</b> see “System reliability guidelines” on page 27</li> </ul>
<b>DASD Over recommended Temperature (sensor x)</b> (level-warning; DASD bay x had over temperature condition)	<ul style="list-style-type: none"> <li>• <b>Ensure that the system is being properly cooled;</b> see “System reliability guidelines” on page 27</li> </ul>
<b>DASD under recommended temperature (sensor x)</b> (level-warning; direct access storage device bay x had under temperature condition)	<ul style="list-style-type: none"> <li>• <b>Ambient temperature must be within normal operating specifications;</b> see “Features and specifications” on page 3.</li> </ul>
<b>DASD Over Temperature</b> (level-critical; sensor for DASD1 reported temperature over recommended range)	<ul style="list-style-type: none"> <li>• <b>Ensure system is being properly cooled;</b> see “System reliability guidelines” on page 27</li> </ul>
<b>Power supply x Temperature Fault</b> (level-critical; power supply x had over temperature condition)	<ol style="list-style-type: none"> <li>1. <b>Ensure system is being properly cooled;</b> see “System reliability guidelines” on page 27</li> <li>2. Replace power supply x</li> </ol>
<b>System board is over recommended temperature</b> (level-warning; system board is over recommended temperature)	<ol style="list-style-type: none"> <li>1. <b>Ensure system is being properly cooled;</b> see “System reliability guidelines” on page 27</li> <li>2. Replace the system board.</li> </ol>
<b>System board is under recommended temperature</b> (level-warning; system board is under recommended temperature)	<ul style="list-style-type: none"> <li>• <b>Ambient temperature must be within normal operating specifications;</b> see “Features and specifications” on page 3.</li> </ul>
<b>System over temperature for CPU x</b> (level-warning; CPU x reporting over temperature condition)	<ul style="list-style-type: none"> <li>• <b>Ensure system is being properly cooled;</b> see “System reliability guidelines” on page 27</li> </ul>
<b>System under recommended CPU x temperature</b> (level-warning; CPU x reporting under temperature condition)	<ul style="list-style-type: none"> <li>• <b>Ambient temperature must be within normal operating specifications;</b> see “Features and specifications” on page 3.</li> </ul>

## Fan error messages

<b>Note:</b> See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.	
Message	Action
<b>Fan x failure</b> (level-critical; fan x had a failure)	<ol style="list-style-type: none"> <li>1. <b>Check connections to fan x.</b></li> <li>2. Replace fan x.</li> </ol>
<b>Fan x fault</b> (level-critical; fan x beyond recommended RPM range)	<ol style="list-style-type: none"> <li>1. <b>Check connections to fan x.</b></li> <li>2. Replace fan x.</li> </ol>
<b>Fan x outside recommended speed action</b>	<ol style="list-style-type: none"> <li>1. <b>Replace fan x.</b></li> </ol>

## Power error messages

<b>Note:</b> See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.	
Message	Action
<b>Power supply x current share fault</b> (level-critical; excessive current demand on power supply x)	<ul style="list-style-type: none"> <li>• <b>Replace power supply x.</b></li> </ul>
<b>Power supply x DC good fault</b> (level-critical; power good signal not detected for power supply x)	<ul style="list-style-type: none"> <li>• <b>Replace power supply x.</b></li> </ul>
<b>Power supply x temperature fault</b>	<ul style="list-style-type: none"> <li>• <b>Replace power supply x.</b></li> </ul>
<b>Power supply x removed</b>	<ul style="list-style-type: none"> <li>• <b>No action required - information only.</b></li> </ul>
<b>Power supply x fan fault</b> (level-critical; fan fault in power supply x)	<ul style="list-style-type: none"> <li>• <b>Replace power supply x.</b></li> </ul>
<b>Power supply x 12 V fault</b> (level-critical; overcurrent condition detected)	<ul style="list-style-type: none"> <li>• <b>See “Power checkout” on page 24.</b></li> </ul>
<b>Power supply x 3.3 V fault</b> (level-critical; 3.3 V power supply x had an error)	<ul style="list-style-type: none"> <li>• <b>See “Power checkout” on page 24.</b></li> </ul>
<b>Power supply x 5 V fault</b> (level-critical; 5 V power supply x had an error)	<ul style="list-style-type: none"> <li>• <b>See “Power checkout” on page 24.</b></li> </ul>
<b>System running non-redundant power</b> (level-noncritical; system does not have redundant power)	<ol style="list-style-type: none"> <li>1. <b>Add another power supply.</b></li> <li>2. Remove options from system.</li> <li>3. System can continue to operate without redundancy protection if steps 1 and 2 are not followed.</li> </ol>
<b>System under recommended voltage for x</b> (level-warning; indicated voltage supply under nominal value; value for x can be +12, -12, or +5)	<ol style="list-style-type: none"> <li>1. <b>Check connections to the power subsystem.</b></li> <li>2. Power supply.</li> <li>3. Power cage assembly, if installed.</li> </ol>

## System shutdown

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

### Voltage related system shutdown

<b>Note:</b> See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.	
Message	Action
<b>System shutoff due to x current over max value</b> (level-critical; system drawing too much current on voltage x bus)	<ul style="list-style-type: none"> <li>• <b>See “Power checkout” on page 24.</b></li> </ul>
<b>System shutoff due to x V over voltage</b> (level-critical; system shutoff due to x supply over voltage)	<ol style="list-style-type: none"> <li>1. <b>Check the power-supply connectors</b></li> <li>2. Power supply.</li> <li>3. Power cage assembly, if installed.</li> </ol>

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Message	Action
<b>System shutoff due to x V under voltage</b> (level-critical; system shutoff due to x supply under voltage)	<ol style="list-style-type: none"> <li>1. <b>Check the power-supply connectors</b></li> <li>2. Power supply.</li> <li>3. Power cage assembly, if installed.</li> </ol>
<b>System shutoff due to VRM x over voltage</b>	<ul style="list-style-type: none"> <li>• <b>Replace VRM x.</b></li> </ul>
<b>System shutoff due to excessive (&lt; 240 VA) loading</b>	<ol style="list-style-type: none"> <li>1. <b>See “Power checkout” on page 24.</b></li> <li>2. Cycle ac on/off.</li> </ol>

## Temperature related system shutdown

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Message	Action
<b>System shutoff due to board over temperature</b> (level-critical; board is over temperature)	<ol style="list-style-type: none"> <li>1. <b>Ensure that the system is being properly cooled;</b> see “System reliability guidelines” on page 27.</li> <li>2. Replace board.</li> </ol>
<b>System shutoff due to CPU x over temperature</b> (level-critical; CPU x is over temperature)	<ol style="list-style-type: none"> <li>1. <b>Ensure that the system is being properly cooled;</b> see “System reliability guidelines” on page 27</li> <li>2. Replace CPU x.</li> </ol>
<b>System shutoff due to CPU x under temperature</b> (level-critical; CPU x is under temperature)	<ul style="list-style-type: none"> <li>• <b>Ambient temperature must be within normal operating specifications;</b> see “Features and specifications” on page 3.</li> </ul>
<b>System shutoff due to DASD temperature (sensor x)</b> (level-critical; DASD area reported temperature outside recommended operating range)	<ul style="list-style-type: none"> <li>• <b>Ensure that the system is being properly cooled;</b> see “System reliability guidelines” on page 27</li> </ul>
<b>System shutoff due to high ambient temperature</b> (level-critical; high ambient temperature)	<ul style="list-style-type: none"> <li>• <b>Ambient temperature must be within normal operating specifications;</b> see “Features and specifications” on page 3.</li> </ul>
<b>System shutoff due to system board under temperature</b> (level-critical; system board is under temperature)	<ul style="list-style-type: none"> <li>• <b>Ambient temperature must be within normal operating specifications;</b> see “Features and specifications” on page 3.</li> </ul>

## DASD checkout

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

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

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## Host built-in self test (BIST)

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

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

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## Bus fault messages

**Note:** See “System replaceable units” on page 142 to determine which components should be replaced by a field service technician.

Bus fault messages	Action
<b>Failure reading I2C device.</b> Check devices on bus 0.	<ol style="list-style-type: none"><li>1. <b>If installed, reseat the I2C cable between Remote Supervisor Adapter and system board.</b></li><li>2. Memory DIMMs.</li><li>3. System board.</li></ol>
<b>Failure reading I2C device.</b> Check devices on bus 1.	<ol style="list-style-type: none"><li>1. <b>Reseat the I2C cable between the operator information panel and system board.</b></li><li>2. Operator information panel.</li><li>3. System board.</li></ol>
<b>Failure reading I2C device.</b> Check devices on bus 2.	<ol style="list-style-type: none"><li>1. <b>Reseat the cable between system board and the power supply (power cage assembly, if installed).</b></li><li>2. Power cage assembly, if installed.</li><li>3. Power supply.</li><li>4. System board.</li></ol>
<b>Failure reading I2C device.</b> Check devices on bus 3.	<ol style="list-style-type: none"><li>1. <b>Reseat the cable between the DASD backplane and connector of system board.</b></li><li>2. DASD backplane.</li><li>3. System board.</li></ol>
<b>Failure reading I2C device.</b> Check device on bus 4.	<ul style="list-style-type: none"><li>• <b>System board</b></li></ul>

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## 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 override switch to override the power-on password and clear the CMOS memory; see “Erasing a lost or forgotten password (clearing CMOS memory)” on page 23. If you suspect that the BIOS code is damaged, see “Recovering the BIOS code” on page 21.

Check the LEDs on all the power supplies. 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. One power supply
  - b. System board with functioning integrated VRD
  - c. One microprocessor
  - d. Memory module (with a minimum of two 256 MB DIMMs)
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.



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## 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.



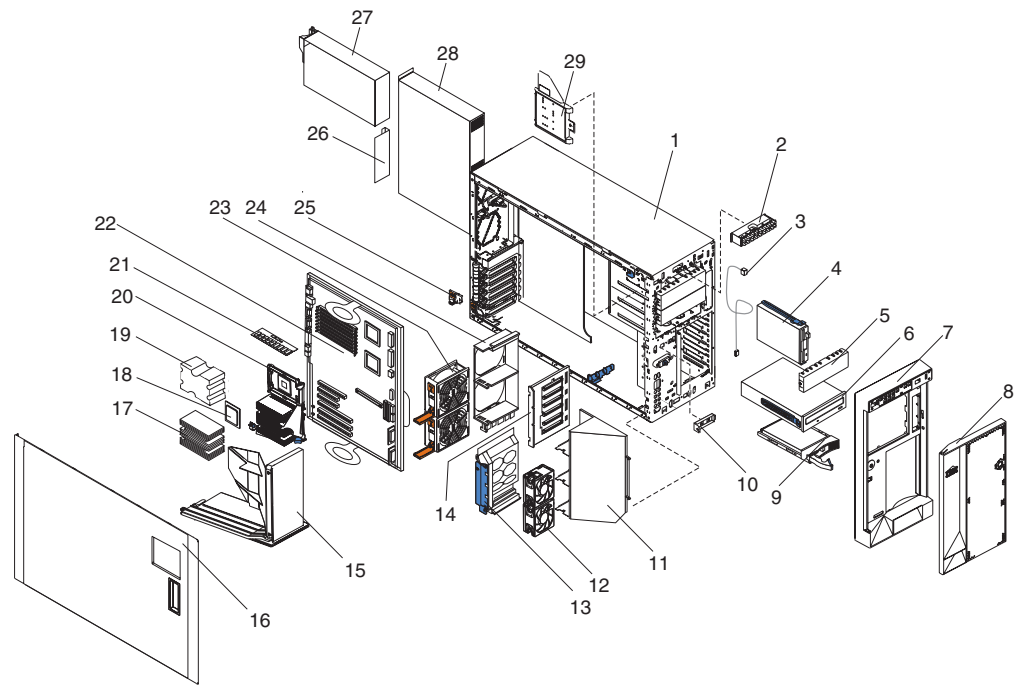
## Chapter 7. Parts listing Type 8841

This parts listing supports the xSeries 236 Type 8841 server. 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 8872 or 8874 and click **Search**.
3. Under Document type, select **Parts information** and click **Go**.

### System

The major components of the xSeries 236 Type 8841 are shown in the following illustration.



## System replaceable units

**Note:**

- 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 236 (Type 8841)	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
1	Chassis (models 01x, 05x, 11x, 21x, 31x, 41x, 15x, 25x, 35x, 45x, 55x)			13N0950
1	Chassis (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)			41Y7689
2	Front panel LED (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)		13M7242	
2	Front panel LED (models 0Rx 1Rx 2Rx 3Rx 4Rx 5Rx)		39Y7131	
3	USB connector cable, single (models 01x, 05x, 11x, 21x, 31x, 41x, 15x, 25x, 35x, 45x, 55x)			21P9687
3	USB connector cable, single (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)			41Y7667
4	Diskette drive (primary, all models)		39M0101	
4	Diskette drive (alternate, models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)		76H4091	
5	Filler panel, hard disk drive (all models)	06P6245		
6	CD-ROM drive, 48X (primary, models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)		71P7375	
6	CD-ROM drive, 48X (primary, models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)		39M3511	
6	CD-ROM drive, 48X (alternate, models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)		71P7385	
6	CD-ROM drive, 48X (optional)		26K5449	
6	Combo drive (optional)		26K5379	
6	CD-RW/DVD drive (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)		39M3539	
6	CD-RW/DVD-RW drive (optional)		26K5383	
6	DVD drive (optional)		39M3515	
6	Multi-burner drive (optional)		39M3519	
7	Bezel, front (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	13N0943		
7	Bezel, front (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	41Y7675		
8	Door (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	13N0941		
8	Door (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	41Y7674		
9	36 GB hard disk drive (optional)	90P1308		
9	36.4 GB hard disk drive (optional)	90P1321		
9	73.4 GB hard disk drive (optional)	90P1309		
9	73.4 GB hard disk drive (optional)	90P1322		

Index	System xSeries 236 (Type 8841)	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
9	146.8 GB hard disk drive (optional)	90P1310		
10	Power reset card (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)			25P3306
10	Power reset card (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)			39Y7128
11	Fan guide, PCI (models 01x, 05x, 11x, 21x, 31x, 41x, 15x, 25x, 35x, 45x, 55x)	13N0944		
12	Fan assembly, 60x60 (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	26K4768		
12	Fan assembly, 60x60 (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	40K6481		
13	Card guide, PCI (all models)	13N0938		
14	Hard drive backplane with carrier assembly (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)		02R1872	
14	Hard drive backplane with carrier assembly (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)		41Y7687	
15	Baffle (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	13N0942		
15	Baffle (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	41Y7676		
16	Cover (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	13N0939		
16	Cover (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	41Y7677		
17	Heat sink (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)		13N1625	
18	Microprocessor, 2.8-1 M (model 01x)		13N1618	
18	Microprocessor, 2.8 GHz (models 05x, 0Rx)		39R7569	
18	Microprocessor, 3.0-1M (model 11x)		90P1033	
18	Microprocessor, 3.0-2M (models 15x, 1Rx)		13M8293	
18	Microprocessor, 3.2-1M (model 21x)		90P1210	
18	Microprocessor, 3.2-2M (models 25x, 2Rx)		13M8294	
18	Microprocessor, 3.4-1M (model 31x)		90P1227	
18	Microprocessor, 3.4-2M (models 35x, 3Rx)		13M8295	
18	Microprocessor, 3.6-1M (model 41x)		90P1229	
18	Microprocessor, 3.6-2M (models 45x, 4Rx)		13M8296	
18	Microprocessor, 3.8 GHz (models 55x, 5Rx)		39R7571	
19	Heat sink, dummy (models 01x, 05x, 11x, 21x, 31x, 41x, 15x, 25x, 35x, 45x, 55x)	26K6065		
19	Heat sink, dummy (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	41Y7693		
20	Retention module (all models)			26K6147
21	Memory, 256 MB (model 01x)	90P1123		
21	Memory, 512 MB (models 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	13N1424		
21	Memory, 512 MB (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	39M5817		
22	System board (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)			32R1953

Index	System xSeries 236 (Type 8841)	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
22	System board (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)			39Y7118
23	Fan assembly, 92 mm (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	48P9687		
23	Fan assembly, 92 mm (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	39M2694		
24	Fan guide, microprocessor (all models)	13N0937		
25	Switch assembly (all models)			13N0940
26	Power supply filler (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	13N0949		
26	Power supply filler (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	39Y7348		
27	Power supply, 670 watt (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	74P4456		
27	Power supply, 670 watt (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	39Y7344		
28	Power cage assembly (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)			74P4458
28	Power cage assembly (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)			39Y7346
29	Diagnostic panel (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)			13N0945
29	Diagnostic panel (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)			39Y7125
	Bezel, rack (models 01x, 05x, 11x, 21x, 31x, 41x, 15x, 25x, 35x, 45x, 55x)	13N0968		
	Battery, 3.0 volt (all models)	33F8354		
	Bracket, tape backup (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)		12J5681	
	Bracket, tape backup (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)		41Y7711	
	Bracket, Remote Supervisory Adapter-2 mounting (optional)		13N0946	
	Cable, CD switch (models 01x, 05x, 11x, 21x, 31x, 41x, 15x, 25x, 35x, 45x, 55x)		21P9685	
	Cable, diskette drive (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)		24P5069	
	Cable, diskette drive (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)		41Y7669	
	Cable, 92 mm fan (models 01x, 05x, 11x, 21x, 31x, 41x, 15x, 25x, 35x, 45x, 55x)		13N0936	
	Cable, 60 mm fan (models 01x, 05x, 11x, 21x, 31x, 41x, 15x, 25x, 35x, 45x, 55x)			13N0947
	Cable, IDE 2-drop (models 01x, 05x, 11x, 21x, 31x, 41x, 15x, 25x, 35x, 45x, 55x)		02R9317	
	Cable, PCI power (all models)		41Y7666	
	Cable, PCI switch (all models)		41Y7673	
	Cable, rear fan (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)		13N0935	
	Cable, rear fan (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)		41Y7670	
	Cable, SCSI 10 in. (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)		59P4199	
	Cable, SCSI U320 (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)		41Y7668	

<b>Index</b>	<b>System xSeries 236 (Type 8841)</b>	<b>CRU No. (Tier 1)</b>	<b>CRU No. (Tier 2)</b>	<b>FRU No.</b>
	Cable, serial (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	02R2061		
	Cable, signal (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	41Y7662		
	Cable, single SCSI (all models)		41Y7671	
	Cable, Ultra ATA (models 0Rx 1Rx 2Rx 3Rx 4Rx 5Rx)	41Y7663		
	Card, Remote Supervisory Adapter-2	73P9324		
	Card, PCI hot plug card (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	39Y7122		
	Divider, PCI (models 01x, 05x, 11x, 21x, 31x, 41x, 15x, 25x, 35x, 45x, 55x)	13N0948		
	Fan assembly, center (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)			41Y7664
	Fan assembly, rear (all models)			41Y7716
	Filler (all models)	00N6407		
	Foot (all models)	02R9308		
	Keylock (all models)	00N6393		
	Kit, alcohol wipe (all models)			59P4739
	Kit, thermal grease (all models)			59P4740
	Lens (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)		13N1031	
	Lens (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)		41Y7709	
	Mouse assembly (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	24P0383		
	Mouse assembly (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	39Y9872		
	Line cord 2.8m (all models)	39M5081		
	Shield, EMC (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	13N0962		
	Slide, diskette drive (all models)	00N6413		
	Slide, hard disk drive (all models)	00N6412		
	Top cover (models 01x, 05x, 11x, 15x, 21x, 25x, 31x, 35x, 41x, 45x, 55x)	13N0976		
	Top cover (models 0Rx, 1Rx, 2Rx, 3Rx, 4Rx, 5Rx)	41Y7704		
	VRM, power supply, 2U/105A (all models)	24R2750		
	VRM, power supply, 2U/105A (optional)	24R2696		

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## Keyboards (CRUs)

Keyboard	CRU No.
Arabic (253)	39M6990
Arabic/French (462)	39M6991
Belgian/French (120)	39M6992
Belgian/UK (120)	39M6993
Brazilian/Portuguese (275)	39M6994
Bulgarian (442)	39M6995
Chinese/US (467)	39M6996
Czech ABB	39M6997
Danish (159)	39M6998
Dutch (143)	39M6999
English, UK (166)	39M7027
English, US (103P)	39M6989
English, US,-EMEA (103P)	39M7028
French (189)	39M7000
French Canadian (058)	39M7002
French Canadian (445)	39M7001
German (129)	39M7003
Greek (319)	39M7004
Hebrew (212)	39M7005
Hungarian (208)	39M7006
Icelandic (197)	39M7007
Italian (141)	39M7008
Italian (142)	39M7009
Japanese (194)	39M7010
Korean (413)	39M7011
Norwegian (155)	39M7013
Polish (214)	39M7014
Portuguese (163)	39M7015
Romanian (96)	39M7016
Russian (443)	39M7017
Russian/Cyrillic (441)	39M7018
Serbian/Cyrillic (118)	39M7019
Slavic (245)	39M7020
Spanish (172)	39M7021
Spanish, Latin American (171)	39M7012
Swedish/Finnish (153)	39M7022
Swiss, F/G (150)	39M7023
Thailand (191)	39M7024
Turkish (179)	39M7026



<b>Keyboard</b>	<b>CRU No.</b>
Turkish (440)	39M7025
Yugoslavian/Latin (234)	39M7029

## 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.

<b>IBM power cord part number</b>	<b>Used in these countries and regions</b>
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, India, Lesotho, Macao, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda

<b>IBM power cord part number</b>	<b>Used in these countries and regions</b>
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, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Taiwan, United States of America, Venezuela
24P6873	Korea (Democratic People's Republic of), Korea (Republic of)
34G0223	Japan
36L8880	Argentina, Paraguay, Uruguay
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

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## Appendix A. Getting help and technical assistance

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

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### Before you call

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system.
- Go to the IBM Support Web site at <http://www.ibm.com/support/> to check for technical information, hints, tips, and new device drivers.
- Use an IBM discussion forum on the IBM Web site to ask questions.

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

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### Using the documentation

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

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### Getting help and information from the World Wide Web

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

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

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## Software service and support

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

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

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## Hardware service and support

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

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

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## 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.

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### 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.

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## 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.

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## 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.



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## 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



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"><li>1. Turn everything OFF.</li><li>2. First, attach all cables to devices.</li><li>3. Attach signal cables to connectors.</li><li>4. Attach power cords to outlet.</li><li>5. Turn device ON.</li></ol>	<ol style="list-style-type: none"><li>1. Turn everything OFF.</li><li>2. First, remove power cords from outlet.</li><li>3. Remove signal cables from connectors.</li><li>4. Remove all cables from devices.</li></ol>

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.

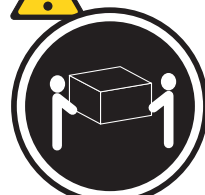


**DANGER**

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



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

### 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.

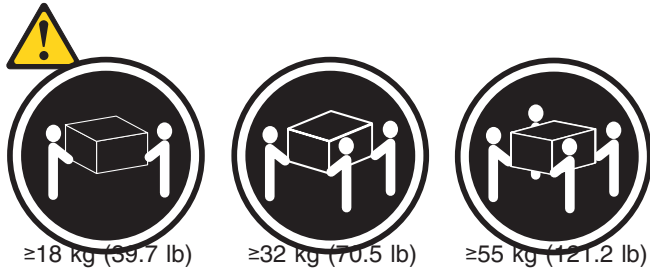


#### **PERIGO**

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



#### CUIDADO:

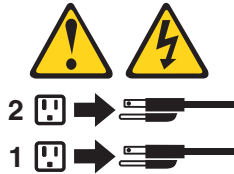
Ao levantar a máquina, faça-o com segurança.

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

## 声明 2



### 警告:

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

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

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

## 声明 3



### 警告:

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

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

非此处指定的其它控制、调整或与性能有关的操作都有可能导致激光辐射的危险。



### 危险

某些激光产品中包含内嵌的 3A 级或 3B 级激光二极管。请注意以下事项。

打开时会产生激光辐射。不要直视光束，不要使用光学仪器直接观看光束，避免直接暴露于光束之下。



声明 4



≥18 kg (37 磅)



≥32 kg (70.5 磅)



≥55 kg (121.2 磅)

警告：  
抬起时请采用安全操作方法。

声明 5



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



声明 6



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

声明 7



警告:

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

声明 8



警告:

不要拆除电源外盖或贴有下列标签的任何部件。



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

声明 9



警告:

为避免人员伤害，拆除设备上的风扇前应拨下热插拔风扇电缆。

声明 10



警告:

机柜安装的设备上面不能放置重于 82kg (180 磅) 的物品。



> 82 kg (180 磅)

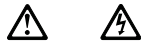
## 重要資訊：

**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



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

### 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.

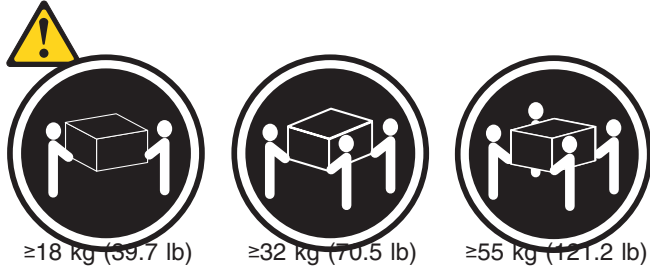


#### DANGER

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**



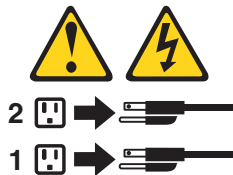
**ATTENTION:**

Faites-vous aider pour soulever ce produit.

**Notice n° 5**



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



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.

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

## 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

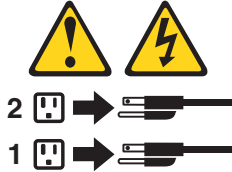
### ACHTUNG:

Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

#### Hinweis 5



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



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

## 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.

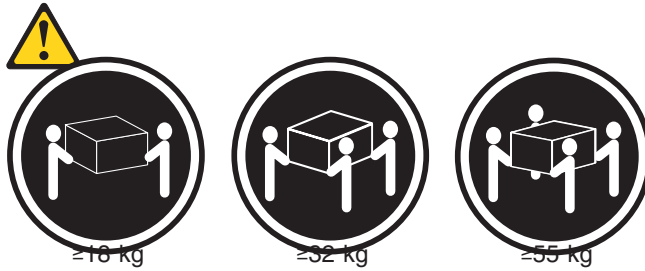


### PERICOLO

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



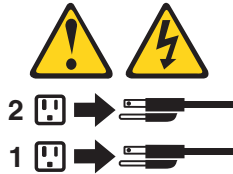
#### ATTENZIONE:

Durante il sollevamento della macchina seguire delle norme di sicurezza.

#### Avviso 5



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	取り外すには
1. すべての電源を切る	1. すべての電源を切る
2. まず、装置にすべてのケーブルを接続する。	2. まず、電源コンセントから電源コードを取り外す
3. 次に、通信ケーブルをコネクタに接続する	3. 次に、通信ケーブルをコネクタから取り外す。
4. その後、電源コンセントに電源コードを接続する	4. その後、装置からすべてのケーブルを取り外す
5. 装置の電源を入れる。	

・記述 2

## 注意

本製品には、システム・ボード上にリチウム電池が使用されています。電池の交換方法や取り扱いを誤ると、発熱、発火、破裂のおそれがあります。

電池の交換には、IBM部品番号33F8354の電池またはメーカー推奨の同等の電池を使用してください。

交換用電池の購入については、お買い求めの販売店または弊社の営業担当までお問い合わせください。

電池は幼児の手の届かない所に置いてください。

万一、幼児が電池を飲み込んだときは、直ちに医師に相談してください。

以下の行為は絶対にしないでください。

- 水にぬらすこと
- 100度C 以上の過熱や焼却
- 分解や充電
- ショート

電池を廃棄する場合、および保存する場合にはテープなどで絶縁してください。他の金属や電池と混ざると発火、破裂の原因となります。電池は地方自治体の条例、または規則に従って廃棄してください。ごみ廃棄場で処分されるごみの中に捨てないでください。

・記述 3

## ⚠ 注意

レーザー製品 (CD-ROM、DVD、または光ファイバー装置または送信器など) が組み込まれている場合は、下記に御注意ください。

- ここに記載されている制御方法、調整方法、または性能を超えて使用すると、危険な放射線を浴びる可能性があります。
- ドライブのカバーを開けると、危険な放射線を浴びる可能性があります。ドライブの内部に修理のために交換可能な部品はありません。カバーを開けないでください。

## ⚠ 危険

一部 CD-ROM ドライブは、Class 3A または Class 3B レーザーダイオードを使用しています。次の点に注意してください。

CD-ROMドライブのカバーを開けるとレーザーが放射されます。光線を見つめたり、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



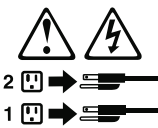
55kg 以上

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 꺼지 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.

<p>연결하려면:</p> <ol style="list-style-type: none"><li>1. 모든 스위치를 끕니다.</li><li>2. 먼저 모든 케이블을 장치에 연결합니다.</li><li>3. 신호 케이블을 커넥터에 연결합니다.</li><li>4. 콘센트에 전원 코드를 연결합니다.</li><li>5. 장치 스위치를 켭니다.</li></ol>	<p>연결을 끊으려면:</p> <ol style="list-style-type: none"><li>1. 모든 스위치를 끕니다.</li><li>2. 먼저 콘센트에서 전원 코드를 뽑습니다.</li><li>3. 신호 케이블을 커넥터에서 제거합니다.</li><li>4. 장치에서 모든 케이블을 제거합니다.</li></ol>
---	--

경고문 2



주의:

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

다음은 주의하십시오.

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

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3



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

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

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



위험

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

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

경고문 4



≥18 kg (37 lbs)



≥ 32 kg (70.5 lbs)



≥ 55 kg (121.2 lbs)

주의:

기계를 들 때는 안전하게 들어 올리십시오.

경고문 5



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



경고문 10



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



>82 kg (180 lbs)

## Importante:

Todas las declaraciones de precaución de esta 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



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

## 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.

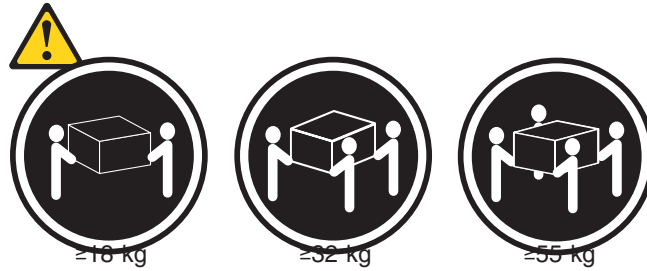


### PELIGRO

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



#### PRECAUCIÓN:

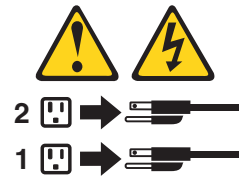
Tome medidas de seguridad al levantar el producto.

#### 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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Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

---

## Product recycling and disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets, and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product-return programs in several countries. Information on product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.

---

## Battery return program

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml> or contact your local waste disposal facility.

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

In the Netherlands, the following applies.



---

## Electronic emission notices

### Federal Communications Commission (FCC) statement

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

#### Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

### Australia and New Zealand Class A statement

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

## United Kingdom telecommunications safety requirement

### Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

## European Union EMC Directive conformance statement

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

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

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

## Taiwanese Class A warning statement

警告使用者：  
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

## Chinese Class A warning statement

声 明  
此为 A 级产品。在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

## Japanese Voluntary Control Council for Interference (VCCI) statement

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