



IBM xSeries 366 Type 8863

Problem Determination and Service Guide







@server

IBM xSeries 366 Type 8863

Problem Determination and Service Guide

**Note:** Before using this information and the product it supports, read the general information in Appendix B, “Notices,” on page 143.

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## Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

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」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

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.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

---

## Guidelines for trained service technicians

This section contains information for trained service technicians.

### Inspecting for unsafe conditions

Use the information in this section to help you identify potential unsafe conditions in an IBM product that you are working on. Each IBM product, as it was designed and manufactured, has required safety items to protect users and service technicians from injury. The information in this section addresses only those items. Use good judgment to identify potential unsafe conditions that might be caused by non-IBM alterations or attachment of non-IBM features or options that are not addressed in this section. If you identify an unsafe condition, you must determine how serious the hazard is and whether you must correct the problem before you work on the product.

Consider the following conditions and the safety hazards that 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 a bulging capacitor.
- Mechanical hazards, such as loose or missing hardware.

To inspect the product for potential unsafe conditions, complete the following steps:

1. Make sure that the power is off and the power cord is disconnected.
2. Make sure that the exterior cover is not damaged, loose, or broken, and observe any sharp edges.
3. Check the power cord:
  - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
  - Make sure that the power cord is the correct type, as specified in "Power cords" on page 93.
  - Make sure that the insulation is not 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 server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

### Guidelines for servicing electrical equipment

Observe the following guidelines when servicing electrical equipment:

- Check the area for electrical hazards such as moist floors, nongrounded power extension cords, power surges, and missing safety grounds.
- Use only approved tools and test equipment. Some hand tools have handles that are covered with a soft material that does not provide insulation from live electrical currents.
- Regularly inspect and maintain your electrical hand tools for safe operational condition. Do not use worn or broken tools or testers.

- Do not touch the reflective surface of a dental mirror to a live electrical circuit. The surface is conductive and can cause personal injury or equipment damage if it touches a live electrical circuit.
- Some rubber floor mats contain small conductive fibers to decrease electrostatic discharge. Do not use this type of mat to protect yourself from electrical shock.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Locate the emergency power-off (EPO) switch, disconnecting switch, or electrical outlet so that you can turn off the power quickly in the event of an electrical accident.
- Disconnect all power before you perform a mechanical inspection, work near power supplies, or remove or install main units.
- Before you work on the equipment, disconnect the power cord. If you cannot disconnect the power cord, have the customer power-off the wall box that supplies power to the equipment and lock the wall box in the off position.
- Never assume that power has been disconnected from a circuit. Check it to make sure that it has been disconnected.
- If you have to work on equipment that has exposed electrical circuits, observe the following precautions:
  - Make sure that another person who is familiar with the power-off controls is near you and is available to turn off the power if necessary.
  - When you are working with powered-on electrical equipment, use only one hand. Keep the other hand in your pocket or behind your back to avoid creating a complete circuit that could cause an electrical shock.
  - When using a tester, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on a suitable rubber mat to insulate you from grounds such as metal floor strips and equipment frames.
- Use extreme care when measuring high voltages.
- To ensure proper grounding of components such as power supplies, pumps, blowers, fans, and motor generators, do not service these components outside of their normal operating locations.
- If an electrical accident occurs, use caution, turn off the power, and send another person to get medical aid.

---

## Safety statements

### **Important:**

Each caution and danger statement in this documentation begins with a number. This number is used to cross reference an English-language caution or danger statement with translated versions of the caution or danger statement in the *Safety Information* document.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in the *Safety Information* document under statement 1.

Be sure to read all caution and danger statements in this documentation before performing the instructions. Read any additional safety information that comes with your server or optional device before you install the device.



Statement 1:



**DANGER**

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

**To avoid a shock hazard:**

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

**To Connect:**

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

**To Disconnect:**

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

**Statement 2:**



**CAUTION:**

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

*Do not:*

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

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

**Statement 3:**



**CAUTION:**

When laser products (such as CD-ROMs, DVD 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.

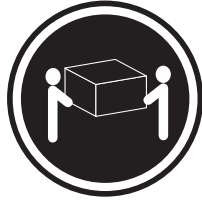


**DANGER**

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)



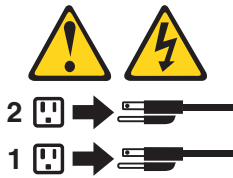
≥ 55 kg (121.2 lb)

**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 8:**



**CAUTION:**

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



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

**Statement 10:**



**CAUTION:**

Do not place any object on top of rack-mounted devices.



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## Chapter 1. Introduction

The IBM® *e*server™ xSeries® 366 server is a 3-U-high<sup>1</sup> rack model server for high-volume network transaction processing. This high-performance, symmetric multiprocessing (SMP) server is ideally suited for networking environments that require superior microprocessor performance, input/output (I/O) flexibility, and high manageability.

The server comes with a limited warranty. For more information about the terms of the warranty, see the *Warranty and Support Information* document on the *IBM xSeries Documentation CD*.

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

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### Related documentation

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

- *Installation Guide*

This printed document contains instructions for setting up the server and basic instructions for installing some options, and how to get help.

- *User's Guide*

This document is in Portable Document Format (PDF) on the *IBM xSeries Documentation CD*. It provides general information about the server, including information about features, and how to configure the server. It also contains detailed instructions for installing, removing, and connecting optional devices that the server supports.

- *Rack Installation Instructions*

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

- *Safety Information*

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

- *Warranty and Support Information*

This document is in PDF on the *xSeries Documentation CD*. It contains information about the terms of the warranty and about service and assistance.

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 you 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.

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

These updates are available from the IBM Web site. Complete the following steps to check for updated documentation and technical updates:

1. Go to <http://www.ibm.com/pc/support/>.
2. In the **Browse by topic** section, click **Publications**.
3. On the Publications page, in the **Brand** field, select **Servers**.
4. In the **Family** field, select **xSeries 366**.
5. Click **Continue**.

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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:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate 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

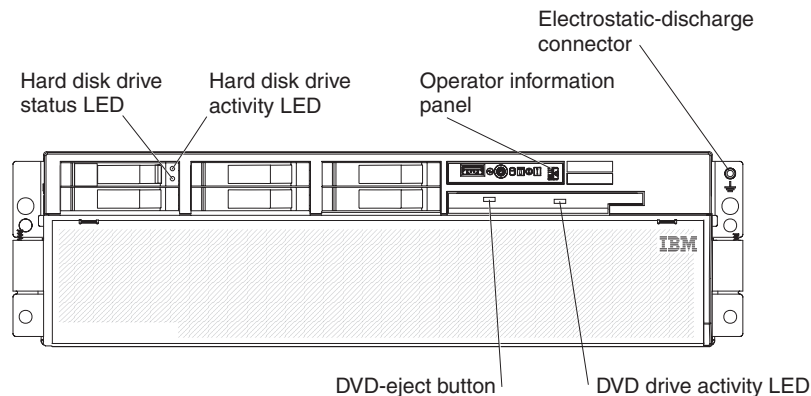
<p><b>Microprocessor:</b></p> <ul style="list-style-type: none"> <li>• Intel™ Xeon™</li> <li>• 1 MB Level-2 cache</li> <li>• 667 MHz front-side bus (FSB)</li> <li>• Support for up to four microprocessors</li> </ul> <p><b>Note:</b> Use the Configuration/Setup Utility program to determine the type and speed of the microprocessors.</p> <p><b>Memory:</b></p> <ul style="list-style-type: none"> <li>• Minimum: 2 GB depending on server model, expandable to 32 GB</li> <li>• Type: 333 MHz, registered, ECC, PC2-3200 double data rate (DDR) II, SDRAM</li> <li>• Sizes: 1 GB or 2 GB in pairs</li> <li>• Connectors: Two-way interleaved, four dual inline memory module (DIMM) connectors per memory card</li> <li>• Maximum: Four memory cards, each card containing two pairs of PC2-3200 DDRII DIMMS</li> </ul> <p><b>Drives:</b></p> <ul style="list-style-type: none"> <li>• Slim DVD-ROM: IDE</li> <li>• Serial Attached SCSI (SAS) hard disk drives</li> </ul> <p><b>Expansion bays:</b></p> <ul style="list-style-type: none"> <li>• Six SAS, 2.5-inch bays</li> <li>• One 12.7-mm removable-media drive bay (DVD-ROM drive installed)</li> </ul> <p><b>Expansion slots:</b></p> <p>Six PCI-X 2.0 hot-plug 266 MHz/64-bit slots</p> <p><b>Upgradeable microcode:</b></p> <p>System BIOS, diagnostics, service processor, BMC, and SAS microcode</p> <p><b>Power supply:</b></p> <ul style="list-style-type: none"> <li>• Standard: One dual-rated power supply <ul style="list-style-type: none"> <li>– 1300 watts at 220 V ac input</li> <li>– 650 watts at 110 V ac input</li> </ul> </li> <li>• Upgradeable to two power supplies (hot-swappable at 220 V ac only)</li> </ul>	<p><b>Size:</b></p> <ul style="list-style-type: none"> <li>• 3U</li> <li>• Height: 128.35 mm (5.05 in.)</li> <li>• Depth: 715 mm (28.15 in.)</li> <li>• Width: 440 mm (17.32 in.)</li> <li>• Weight: approximately 38.5 kg (85 lb) when fully configured or 31.75 kg (70 lb) minimum</li> </ul> <p>Racks are marked in vertical increments of 4.45 cm (1.75 inches). Each increment is referred to as a unit, or “U.” A 1-U-high device is 4.45 cm (1.75 inches) tall.</p> <p><b>Integrated functions:</b></p> <ul style="list-style-type: none"> <li>• Baseboard management controller</li> <li>• IBM EXA-32 Chipset with integrated memory and I/O controller</li> <li>• Service processor support for Remote Supervisor Adapter II SlimLine</li> <li>• Light path diagnostics</li> <li>• Three Universal Serial Bus (USB) ports <ul style="list-style-type: none"> <li>– Two on rear of server</li> <li>– One on front of server</li> </ul> </li> <li>• Broadcom 5704C dual 10/100/1000 Gigabit Ethernet controllers</li> <li>• ATI 7000-M video <ul style="list-style-type: none"> <li>– 16 MB video memory</li> <li>– SVGA compatible</li> </ul> </li> <li>• Mouse connector</li> <li>• Keyboard connector</li> <li>• Serial connector</li> </ul> <p><b>Acoustical noise emissions:</b></p> <ul style="list-style-type: none"> <li>• Sound power, idle: 6.6 bel declared</li> <li>• Sound power, operating: 6.6 bel declared</li> </ul> <p><b>Environment:</b></p> <ul style="list-style-type: none"> <li>• <b>Air temperature:</b> <ul style="list-style-type: none"> <li>– Server on: 10° to 35°C (50.0° to 95.0°F); altitude: 0 to 2133 m (6998.0 ft)</li> <li>– Server off: 10° to 43°C (50.0° to 109.4°F); maximum altitude: 2133 m (6998.0 ft)</li> </ul> </li> <li>• <b>Humidity:</b> <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>Heat output:</b></p> <p>Approximate heat output in British thermal units (Btu) per hour:</p> <ul style="list-style-type: none"> <li>• Minimum configuration: 1364 Btu (400 watts) per hour</li> <li>• Maximum configuration: 5780 Btu (1700 watts) per hour</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 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>• Approximate input kilovolt-amperes (kVA): <ul style="list-style-type: none"> <li>– Minimum: 0.40 kVA</li> <li>– Maximum: 1.6 kVA</li> </ul> </li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use.</li> <li>2. These levels were measured in controlled acoustical environments according to the procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779 and are reported in accordance with ISO 9296. Actual sound-pressure levels in a given location might exceed the average values stated because of room reflections and other nearby noise sources. The declared sound-power levels indicate an upper limit, below which a large number of computers will operate.</li> </ol>
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## Server controls, LEDs, and connectors

This section describes the controls, light-emitting diodes (LEDs), and connectors on the front and rear of the server.

### Front view

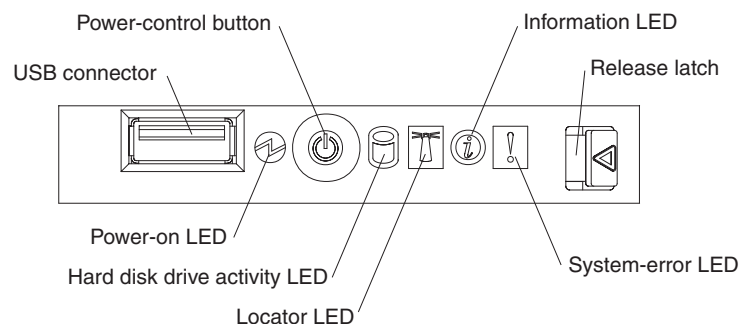
The following illustration shows the controls, LEDs, and connectors on the front of the server.



**Hard disk drive status LED:** If a ServeRAID-8i adapter is installed, when this LED is lit it indicates that the associated hard disk drive has failed. If 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.

**Hard disk drive activity LED:** On some server models, each hot-swap hard disk drive has an activity LED. When this LED is flashing, it indicates that the drive is in use.

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



The following controls, connectors, and LEDs are on the operator information panel:

- **USB connector:** Connect a USB device to this connector.
- **Power-control button:** Press this button to turn the server on and off manually. A power-control-button shield comes with the server.
- **Information LED:** When this LED is lit, it indicates that an error or warning message has been written to the system event log.
- **Release latch:** Slide this latch to the left to access the light path diagnostics panel.



- **System-error LED:** When this LED is lit, it indicates that a system error has occurred. An LED on the light path diagnostics panel is also lit to help isolate the error.
- **Locator LED:** When this LED is lit, it has been lit remotely by the system administrator to aid in visually locating the server.
- **Hard disk drive activity LED:** When this LED is flashing, it indicates that a SAS hard disk drive is in use.
- **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.

**Note:** If this LED is off, it does not mean that there is no electrical power in the server. The LED might be burned out. To remove all electrical power from the server, you must disconnect the power cords from the electrical outlets.

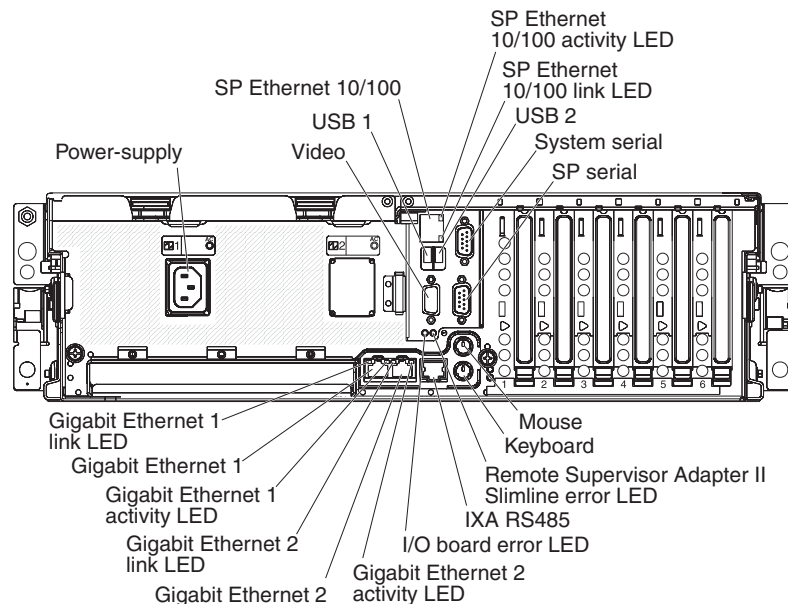
**DVD-eject button:** Press this button to release a CD or DVD from the DVD drive.

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

**Electrostatic-discharge connector:** Connect an electrostatic-discharge wrist strap to this connector.

## Rear view

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



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

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

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

**SP Ethernet 10/100 connector:** Use this connector to connect the service processor to a network.

**SP Ethernet 10/100 activity LED:** This LED is on the SP Ethernet 10/100 connector. When this LED is lit, it indicates that there is activity between the server and the network.

**SP Ethernet 10/100 link LED:** This LED is on the SP Ethernet 10/100 connector. When this LED is lit, it indicates that there is an active connection on the Ethernet port.

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

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

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

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

**Keyboard connector:** Connect a keyboard to this connector.

**Remote Supervisor Adapter II SlimLine error LED:** This LED is on the I/O board and is visible on the rear of the server. When this LED is lit, it indicates that there is a problem with the Remote Supervisor Adapter II SlimLine.

**IXA RS485 connector:** Use this connector to connect to an iSeries server when an Integrated xSeries Adapter (IXA) is installed.

**I/O board error LED:** This LED is on the I/O board and is visible on the rear of the server. When this LED is lit, it indicates that there is a problem with the I/O board.

**Gigabit Ethernet 2 activity LED:** This LED is on the Gigabit Ethernet 2 connector. When this LED flashes, it indicates that there is activity between the server and the network.

**Gigabit Ethernet 2 connector:** Use this connector to connect the server to a network.

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

**Gigabit Ethernet 1 activity LED:** This LED is on the Gigabit Ethernet 1 connector. When this LED flashes, it indicates that there is activity between the server and the network.

**Gigabit Ethernet 1 connector:** Use this connector to connect the server to a network.

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

## System-board layouts

The following illustrations show the connectors, LEDs, and jumpers on the memory card, microprocessor board, PCI-X board, SAS backplane, and I/O board. The illustrations in this document might differ slightly from your hardware.

### I/O board internal connectors and jumpers

The following illustration shows the internal connectors and jumpers on the I/O board.

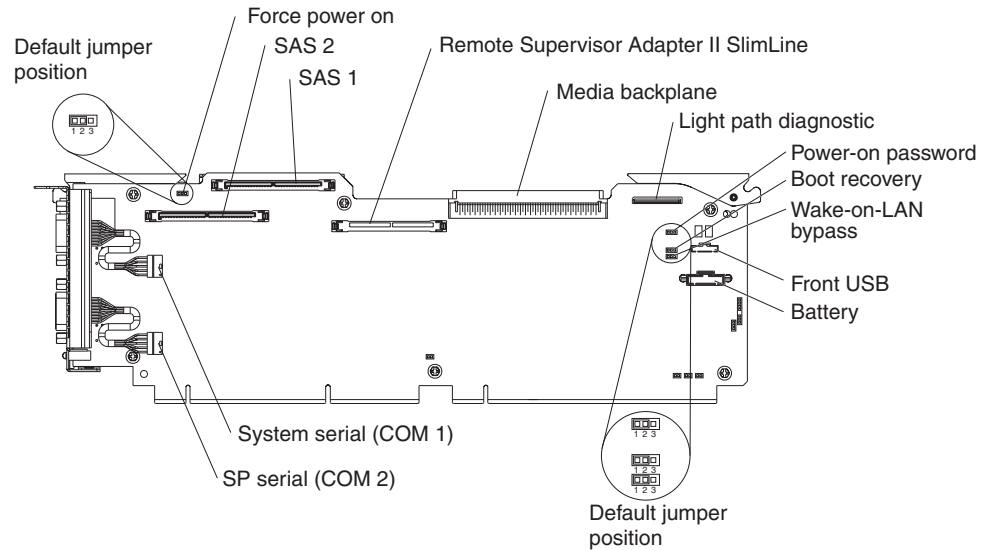


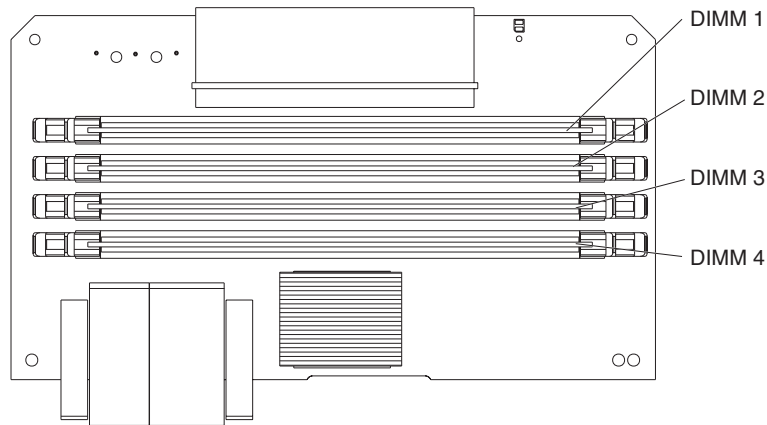
Table 2 describes the function of each three-pin jumper block.

Table 2. I/O board jumper blocks

Jumper name	Description
Force power on (J2)	The default position is pins 1 and 2. Change the position of this jumper to pins 2 and 3 to force the server to startup when you connect the server to ac power.
Power-on password (J9)	The default position is pins 1 and 2. Change the position of this jumper to pins 2 and 3 to bypass the power-on password check.  Changing the position of this jumper does not affect the administrator password check if an administrator password is set. If the administrator password is lost, the operator information panel must be replaced.
Boot recovery (J14)	The default position is pins 1 and 2 (use the primary page during startup). Move the jumper to pins 2 and 3 to use the secondary page during startup.
Wake on LAN <sup>®</sup> bypass (J15)	The default position is pins 1 and 2. Move the jumper to pins 2 and 3 to prevent a Wake on LAN packet from waking the system when the system is in the powered-off state.

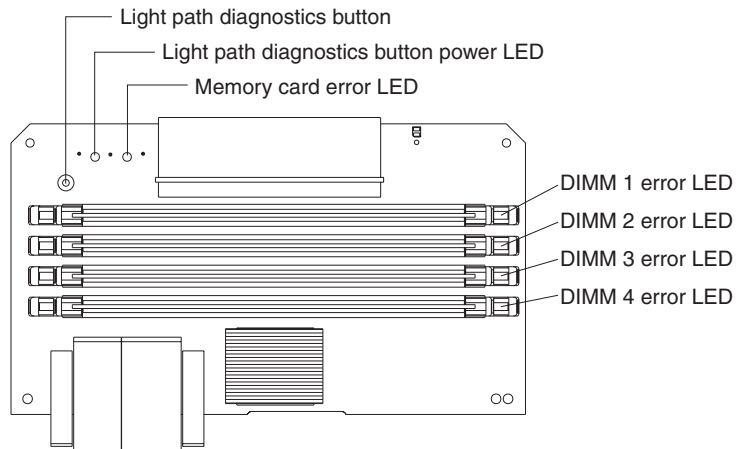
## Memory-card connectors

The following illustration shows the connectors on the memory card.

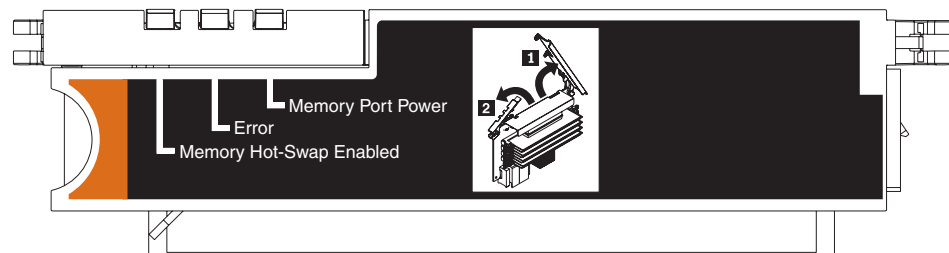


## Memory-card LEDs

The following illustration shows the LEDs on the memory card.

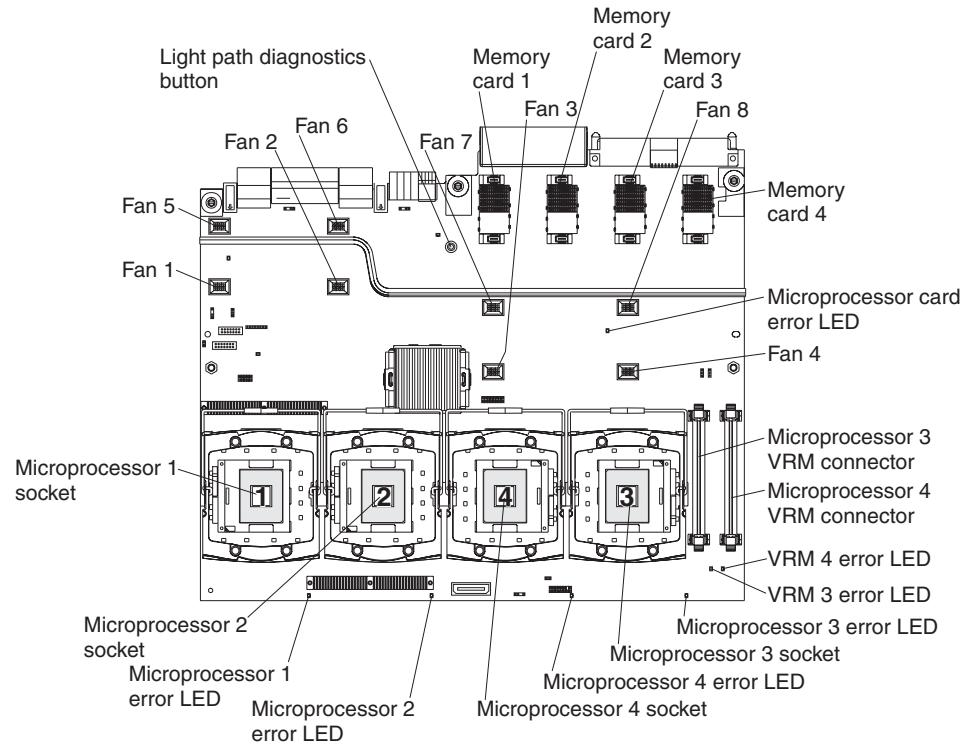


Top view of the memory card



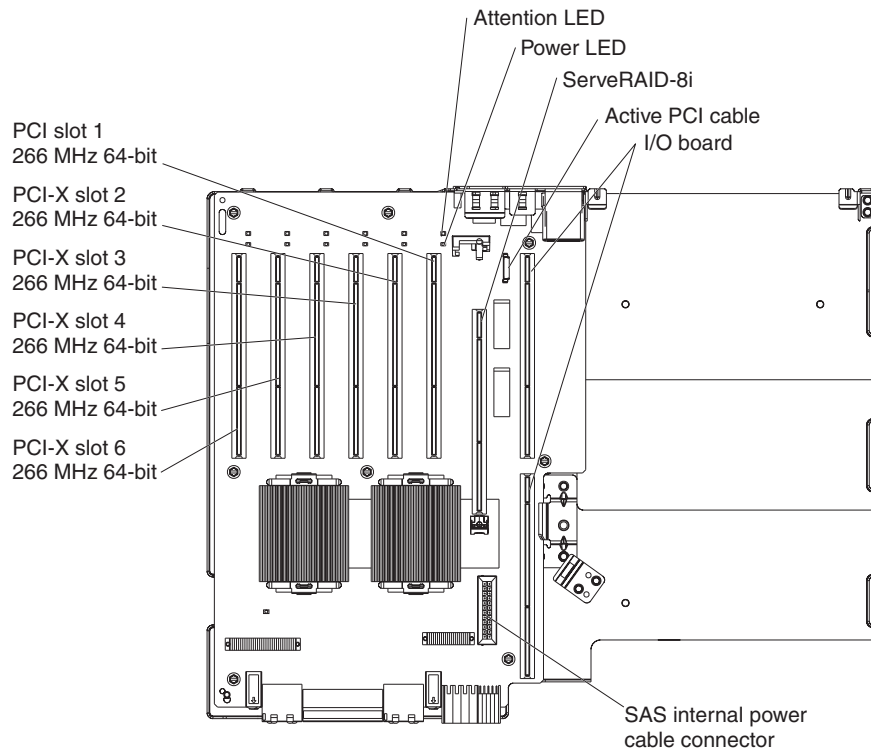
## Microprocessor-board connectors and LEDs

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



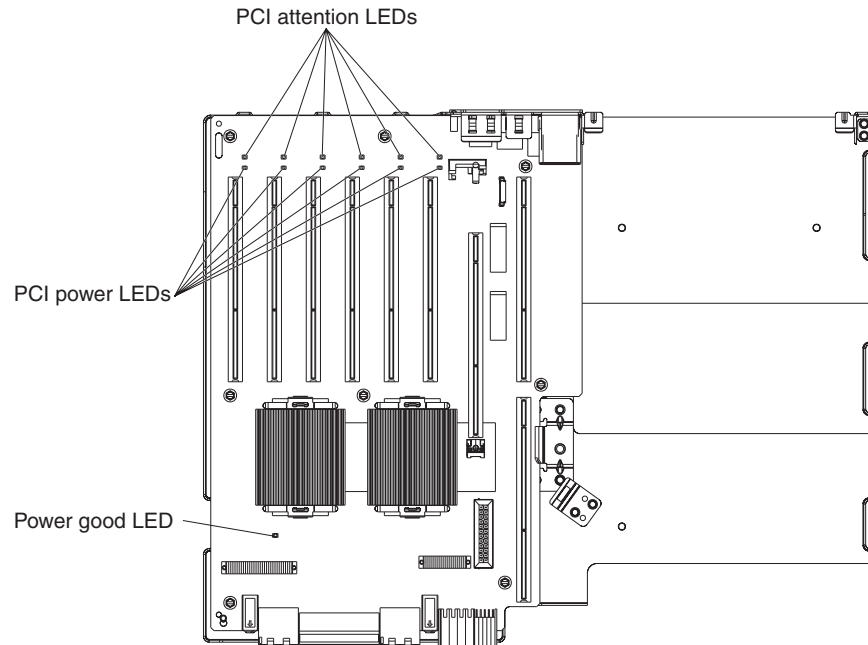
## PCI-X board connectors

The following illustration shows the connectors on the PCI-X board.



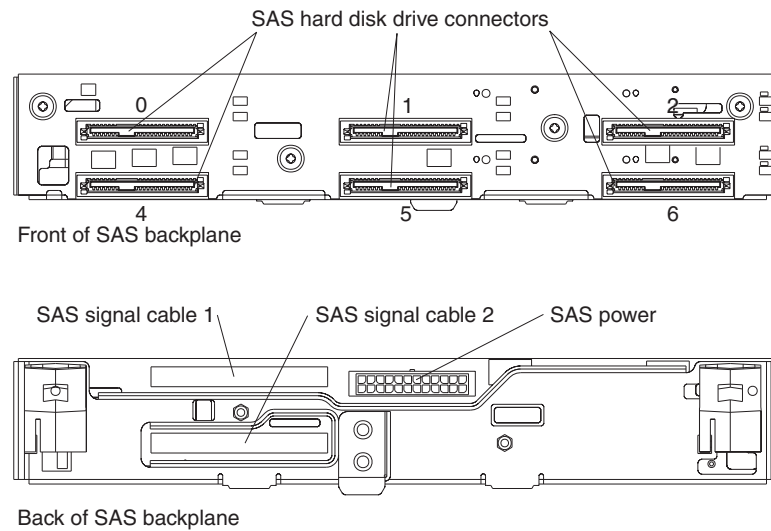
## PCI-X board LEDs

The following illustration shows the LEDs on the PCI-X board.



## SAS-backplane connectors

The following illustration shows the connectors on the SAS backplane.



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## Chapter 2. Diagnostics

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

If you cannot locate and correct the problem using the information in this chapter, see Appendix A, “Getting help and technical assistance,” on page 141 for more information.

---

### Diagnostic tools

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

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

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

- **Problem isolation tables**

Use these tables to help you diagnose various symptoms. See “Problem isolation tables” on page 33.

- **Light path diagnostics**

Use the light path diagnostics to diagnose system errors quickly. See “Light path diagnostics” on page 46 for more information.

- **Diagnostic programs and error messages**

The diagnostic programs are stored in memory on the microprocessor tray. These programs are the primary method of testing the major components of the server. See “Diagnostic programs, messages, and error codes” on page 55 for more information.

---

### POST

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

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

If POST detects a problem, more than one beep might sound, or an error message appears on the screen. See “Beep code descriptions” on page 12 and “POST error codes” on page 18 for more information.

**Notes:**

1. If a power-on password is set, you must type the password and press Enter, when prompted, before POST will continue.
2. A single problem might cause several error messages. When this occurs, correct the cause of the first error message. The other error messages usually will not occur the next time you run the test.

## POST beep codes

A beep code is a combination of short or long beeps or a series of short beeps separated by pauses. For example, a “1-2-3” beep code is one beep, a pause, two beeps, a pause, and three beeps.

When POST is completed, one beep is emitted to indicate that the server is working correctly. If POST detects a problem during startup, other beep codes might occur. See “Beep code descriptions” to help diagnose and solve problems that are detected during startup. If no beep code sounds, see “No-beep symptoms” on page 16.

### Beep code descriptions

The following table describes the beep codes and suggested actions to correct the detected problems.

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>		
Beep code	Description	Action
1-1-3	CMOS write/read test failed.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
1-1-4	BIOS ROM checksum failed.	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
1-2-1	Programmable interval timer failed.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
1-2-2	DMA initialization failed.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
1-2-3	DMA page register write/read failed.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
1-2-4	RAM refresh verification failed.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. DIMM</li> <li>b. Memory card</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
1-3-1	1st 64K RAM test failed.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. DIMM</li> <li>b. Memory card</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>



- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Beep code	Description	Action
2-1-1	Secondary DMA register failed.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
2-1-2	Primary DMA register failed.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
2-1-3	Primary interrupt mask register failed.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
2-1-4	Secondary interrupt mask register failed.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
2-2-2	Keyboard controller failed.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
3-1-1	Timer tick interrupt failed.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
3-1-2	Interval timer channel 2 failed.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
3-1-4	Time-of-day clock failed.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
3-3-2	Critical SMBUS error occurred.	<ol style="list-style-type: none"> <li>1. Disconnect power cord, wait 30 seconds, and retry.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. DIMM</li> <li>b. Memory card</li> <li>c. Microprocessor tray</li> <li>d. I/O board</li> </ol> </li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> <li>a. DIMM</li> <li>b. Memory card</li> <li>c. (Trained service technician only) Microprocessor tray</li> <li>d. I/O board</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Beep code	Description	Action
3-3-3	No operational memory in system.	<ol style="list-style-type: none"> <li>1. Make sure that all memory cards contain the correct number of DIMMs; install or reseal DIMMS; then, restart the server.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. DIMM</li> <li>b. Memory card</li> <li>c. Microprocessor tray</li> </ol> </li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> <li>a. DIMM</li> <li>b. Memory card</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
Two short beeps	Information only, configuration has changed.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Run the diagnostic programs.</li> </ol>
Three short beeps	Memory error.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. DIMM</li> <li>b. Memory card</li> <li>c. Microprocessor tray</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> <li>a. DIMM</li> <li>b. Memory card</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
One continuous beep	Microprocessor error.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor</li> <li>b. (Trained service technician only) Optional microprocessor</li> <li>c. Microprocessor tray</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor</li> <li>b. (Trained service technician only) Optional microprocessor</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Beep code	Description	Action
Repeating short beeps	Keyboard error.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Keyboard</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
Repeating long beeps	Memory error.	Reseat the DIMMs.
One long and one short beep	Card error.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Microprocessor tray</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor tray</li> <li>b. I/O board</li> </ol> </li> </ol>
One long and two short beeps	Card error.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Microprocessor tray</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor tray</li> <li>b. I/O board</li> </ol> </li> </ol>
Two long and two short beeps	Card error.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Microprocessor tray</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor tray</li> <li>b. I/O board</li> </ol> </li> </ol>

## No-beep symptoms

<ul style="list-style-type: none"> <li>Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>		
No-beep symptom	Description	Action
No beeps occur, and the system operates correctly.		<ol style="list-style-type: none"> <li>(Trained service technician only) Reseat the operator information panel.</li> <li>(Trained service technician only) Replace the operator information panel.</li> </ol>
No beeps occur after successful completion of POST.	The power-on status is Disabled.	<ol style="list-style-type: none"> <li>Run the Configuration/Setup Utility program and select <b>Start Options</b>; then, set <b>Power-On Status</b> to <b>Enable</b>.</li> <li>(Trained service technician only) Reseat the operator information panel.</li> <li>(Trained service technician only) Replace the operator information panel.</li> </ol>
No beeps occur, and there is no video.		See “Solving undetermined problems” on page 88.

## Error logs

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

### Notes:

- The BMC log is limited in size and is designed so that when the log is full, new entries will not overwrite existing entries; therefore, you must periodically clear the BMC log from the Configuration/Setup Utility program (the menu choices are described in the *User's Guide*).
- When troubleshooting an error, make sure to clear the BMC log so that you can find current errors more easily.
- Entries written to the BMC log early in the POST procedure will show an incorrect date as the default timestamp; however, the date and time will correct itself as POST continues.
- Each BMC log entry appears on its own page; to display all the data for an entry, use the up arrow (↑) and down arrow (↓) or the Page Up and Page Down keys. To move from one entry to the next, move the cursor to the **Get Next Entry** or **Get Previous Entry** line; then, press Enter.
- The log indicates an Assertion Event when an event has occurred. It indicates a Deassertion Event when the event is no longer occurring.
- Some of the error codes and messages in the BMC log are abbreviated.
- Viewing the BMC log through the web interface of the optional Remote Supervisor Adapter II SlimLine allows all messages to be translated.

The following illustration shows an example of a BMC log entry.

```
BMC System Event Log
-----
Get Next Entry
Get Previous Entry
Clear BMC SEL

Entry Number=      00005 / 00011
Record ID=         0005
Record Type=       02
Timestamp=         2005/01/25 16:15:17
Entry Details:     Generator ID= 0020
                  Sensor Type= 04
                  Assertion Event
                  Fan
                  Threshold
                  Lower Non-critical - going high

                  Sensor Number= 40
                  Event Direction/Type= 01

                  Event Data= 52 00 1A
```

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

**Note:** When troubleshooting PCI-X slots, note that the error logs report the PCI-X buses numerically. The numerical assignments vary depending on the configuration. You can check the assignments by running the Configuration/Setup Utility program (see the *User's Guide* for more information).

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

For complete information about using the Configuration/Setup Utility program, see the *User's Guide*.

To view the error logs, complete the following steps:

1. Turn on the server.
2. When the prompt Press F1 for Configuration/Setup appears, press F1. If you have set both a power-on password and an administrator password, you must type the administrator password to view the error logs.
3. Use one of the following procedures:
  - To view the POST error log, select **Error Logs**, and then select **POST Error Log**.
  - To view the BMC log, select **Advanced Settings**, select **Baseboard Management Controller (BMC) settings**, and then select **BMC System Event Log**.
  - To view the system-error log (available only if an optional Remote Supervisor Adapter II SlimLine is installed), select **Event/Error Logs**, and then select **System Event/Error Log**.

### Viewing the BMC log from the diagnostic programs

The BMC log contains the same information whether it is viewed from the Configuration/Setup Utility program or from the diagnostic programs.

#### Notes:

- Some of the error codes and messages in the BMC log are abbreviated.

- Viewing the BMC log through the web interface of the optional Remote Supervisor Adapter II SlimLine allows all messages to be translated.

For information about using the diagnostic programs, see “Running the on-board diagnostic programs” on page 56.

To view the BMC log, complete the following steps:

1. If the server is running, turn off the server and all attached devices.
2. Turn on all attached devices; then, turn on the server.
3. When the prompt F2 for Diagnostics appears, press F2. If you have set both a power-on password and an administrator password, you must type the administrator password to run the diagnostic programs.
4. From the top of the screen, select **Hardware Info**.
5. From the list, select **BMC Log**.

## POST error codes

The following table describes the POST error codes and suggested actions to correct the detected problems.

Error code	Description	Action
<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>		
062	Three consecutive boot failures using the default configuration.	<ol style="list-style-type: none"> <li>1. Flash the system firmware to the latest level (see “Updating the firmware” on page 131).</li> <li>2. Reseat the I/O board.</li> <li>3. Replace the I/O board.</li> </ol>
101, 102	Tick timer internal interrupt, internal timer channel 2.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
114	Adapter read-only memory (ROM) error.	<ol style="list-style-type: none"> <li>1. Remove all adapters and reinstall them one at a time, restarting the server each time, to identify the failing adapter; then, replace the failing adapter.</li> <li>2. Reseat the microprocessor tray.</li> <li>3. Reseat the I/O board.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> <li>5. Replace the I/O board.</li> </ol>
151	Real-time clock error.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
161	Real-time clock battery error.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
162	Device configuration error.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program, select <b>Load Default Settings</b>, and save the settings.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. Failing device</li> <li>c. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
163	Real-time clock error.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program, select <b>Load Default Settings</b>, make sure that the date and time are correct, and save the settings.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
175	Bad EEPROM CRC#1.	<ol style="list-style-type: none"> <li>1. Restart the server.</li> <li>2. Update the BMC firmware (see “Updating the firmware” on page 131).</li> <li>3. Reseat the microprocessor tray.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
178	System VPD not available.	<ol style="list-style-type: none"> <li>1. Restart the server.</li> <li>2. Update the BMC firmware (see “Updating the firmware” on page 131).</li> <li>3. Reseat the microprocessor tray.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
184	Power-on password damaged.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program, select <b>Load Default Settings</b>, and save the settings.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
187	VPD serial number not set.	<ol style="list-style-type: none"> <li>1. Set the serial number by updating the BIOS code level (see “Updating the firmware” on page 131).</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. I/O board</li> <li>b. Optional Remote Supervisor Adapter II SlimLine</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
188	Bad EEPROM CRC #2.	<ol style="list-style-type: none"> <li>1. Restart the server.</li> <li>2. Update the BMC firmware (see “Updating the firmware” on page 131).</li> <li>3. Reseat the microprocessor tray.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
189	An attempt was made to access the server with an incorrect password.	Restart the server and enter the administrator password; then, run the Configuration/Setup Utility program and change the power-on password.
289	A DIMM has been disabled by the user or by the system.	<ol style="list-style-type: none"> <li>1. If the DIMM was disabled by the user, run the Configuration/Setup Utility program and enable the DIMM.</li> <li>2. Make sure that the DIMM is installed correctly (see “Memory module” on page 105).</li> <li>3. Reseat the DIMM.</li> <li>4. Replace the DIMM.</li> </ol>



- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
301	Keyboard or keyboard controller error.	<ol style="list-style-type: none"> <li>1. If you have installed a USB keyboard, run the Configuration/Setup Utility program and enable keyboardless operation to prevent the POST error message 301 from being displayed during startup.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Keyboard</li> <li>b. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
303	Keyboard controller error.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. I/O board</li> <li>b. Keyboard</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
1600	The baseboard management controller failed BIST (built-in self-test).	<ol style="list-style-type: none"> <li>1. Update the BMC firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Microprocessor tray</li> <li>b. I/O board</li> <li>c. PCI or PCI-X adapters</li> </ol> </li> <li>3. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
1601	Systems-management adapter communication error.	<ol style="list-style-type: none"> <li>1. Make sure that the Remote Supervisor Adapter II SlimLine is installed correctly.</li> <li>2. Update the Remote Supervisor Adapter II SlimLine firmware (see “Updating the firmware” on page 131).</li> <li>3. Update the BMC firmware (see “Updating the firmware” on page 131).</li> <li>4. Reseat the following components: <ol style="list-style-type: none"> <li>a. Microprocessor tray</li> <li>b. I/O board</li> <li>c. PCI or PCI-X adapter</li> </ol> </li> <li>5. (Trained service technician only) Replace the microprocessor tray.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
1602	Systems-management adapter communication error.	<ol style="list-style-type: none"> <li>1. Make sure that the Remote Supervisor Adapter II SlimLine is installed correctly.</li> <li>2. Update the Remote Supervisor Adapter II SlimLine firmware (see “Updating the firmware” on page 131).</li> <li>3. Update the BMC firmware (see “Updating the firmware” on page 131).</li> <li>4. Reseat the following components: <ol style="list-style-type: none"> <li>a. Microprocessor tray</li> <li>b. I/O board</li> <li>c. (Trained service technician only) PCI-X board</li> </ol> </li> <li>5. Replace the Remote Supervisor Adapter II SlimLine.</li> <li>6. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
1762	Fixed disk configuration error.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program and load the defaults.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. SAS cables</li> <li>b. SAS hard disk drive</li> <li>c. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
178x	Fixed disk error.	<ol style="list-style-type: none"> <li>1. Reseat the hard disk drive cables.</li> <li>2. Replace the hard disk drive cables.</li> <li>3. Run the hard disk drive diagnostic tests.</li> <li>4. Reseat the following components: <ol style="list-style-type: none"> <li>a. Optional ServeRAID™-8i adapter.</li> <li>b. Hard disk drive.</li> <li>c. I/O board.</li> </ol> </li> <li>5. Replace the components listed in step 4 one at a time, in the order shown, restarting the server each time.</li> </ol>
1800	Unavailable PCI hardware interrupt.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program and adjust the adapter settings.</li> <li>2. Remove each adapter one at a time, restarting the server each time, until the problem is isolated.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
1962	A drive does not contain a valid boot sector.	<ol style="list-style-type: none"> <li>1. Make sure that a bootable operating system is installed.</li> <li>2. Run the hard disk drive diagnostic tests.</li> <li>3. Reseat the following components:               <ol style="list-style-type: none"> <li>a. SAS drive</li> <li>b. SAS hard disk drive backplane cable</li> <li>c. I/O board</li> </ol> </li> <li>4. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li> </ol>
5962	IDE CD or DVD drive configuration error.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program and load the default settings (see “Configuration/Setup Utility menu choices” on page 133).</li> <li>2. Reseat the following components:               <ol style="list-style-type: none"> <li>a. CD or DVD drive cable</li> <li>b. CD or DVD drive</li> <li>c. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
8603	Pointing-device error.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Pointing device</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
0001295	ECC circuit check.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. DIMM</li> <li>b. Memory card</li> </ol> </li> <li>2. Replace the components in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
00012000	Processor machine check error.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor</li> <li>Microprocessor tray</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
00019501	Processor 1 is not functioning; check processor LEDs.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>Microprocessor tray</li> <li>(Trained service technician only) Microprocessor 1</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor 1</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
00019502	Processor 2 is not functioning; check processor LEDs.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>Microprocessor tray</li> <li>(Trained service technician only) Microprocessor 2</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor 2</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
00019503	Processor 3 is not functioning; check VRM and processor LEDs.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>Microprocessor tray</li> <li>VRM 3</li> <li>(Trained service technician only) Microprocessor 3</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>VRM 3</li> <li>(Trained service technician only) Microprocessor 3</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
00019504	Processor 4 is not functioning; check VRM and processor LEDs.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>Microprocessor tray</li> <li>VRM 4</li> <li>(Trained service technician only) Microprocessor 4</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>VRM 4</li> <li>(Trained service technician only) Microprocessor 4</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
00019701	Processor 1 failed BIST.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor 1</li> <li>Microprocessor tray</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor 1</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
00019702	Processor 2 failed BIST.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor 2</li> <li>b. Microprocessor tray</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor 2</li> <li>b. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
00019703	Processor 3 failed BIST.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor 3</li> <li>b. VRM3</li> <li>c. Microprocessor tray</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor 3</li> <li>b. VRM3</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
00019704	Processor 4 failed BIST.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor 4</li> <li>b. VRM4</li> <li>c. Microprocessor tray</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor 4</li> <li>b. VRM4</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
00180100	A PCI adapter has requested memory resources that are not available.	<ol style="list-style-type: none"> <li>1. Change the order of the adapters in the PCI-X slots. Make sure that the boot device is positioned early in the scan order (see the <i>User's Guide</i> for information about the scan order).</li> <li>2. Make sure that the settings for the PCI or PCI-X adapter and all other adapters in the Configuration/Setup Utility program are correct. If the memory resource settings are not correct, change them.</li> <li>3. If all memory resources are being used, remove an adapter to make memory available to the PCI or PCI-X adapter. Disabling the BIOS on the adapter should correct the error. See the documentation that comes with the adapter.</li> </ol>
00180200	No more I/O space is available for a PCI adapter.	<ol style="list-style-type: none"> <li>1. If the error code indicates a particular PCI or PCI-X slot or device, remove that device.</li> <li>2. If the error continues, reseal the following components: <ol style="list-style-type: none"> <li>a. Each adapter</li> <li>b. (Trained service technician only) PCI-X board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
00180300	No more memory (above 1 MB for a PCI adapter).	<ol style="list-style-type: none"> <li>1. If the error code indicates a particular PCI or PCI-X slot or device, remove that device.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Each adapter</li> <li>b. (Trained service technician only) PCI-X board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
00180400	No more memory (below 1 MB for a PCI adapter).	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Each adapter</li> <li>b. (Trained service technician only) PCI-X board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
00180500	PCI option ROM checksum error.	<ol style="list-style-type: none"> <li>1. Remove the failing PCI or PCI-X adapter.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Each adapter</li> <li>b. (Trained service technician only) PCI-X board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
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Error code	Description	Action
00180600	PCI built-in self-test failure.	<ol style="list-style-type: none"> <li>1. If the error code indicates a particular PCI or PCI-X slot or device, remove that device. <b>Note:</b> Slot 0 indicates the I/O board.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Each adapter</li> <li>b. (Trained service technician only, if the specified board is a FRU) The board indicated in the error code. (See Chapter 3, “Parts listing, Type 8863,” on page 91, to determine CRU or FRU status.)</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown above, restarting the server each time.</li> </ol>
00180700, 00180800	General PCI error.	<ol style="list-style-type: none"> <li>1. Make sure that no devices have been disabled in the Configuration/Setup Utility program.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Failing adapter <b>Note:</b> If an error LED is lit on the PCI-X board or on an adapter, reseat that adapter first; if no LEDs are lit, reseat each adapter one at a time, restarting the server each time, to isolate the failing adapter.</li> <li>b. (Trained service technician only) PCI-X board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
00181000	PCI error.	<ol style="list-style-type: none"> <li>1. Remove the adapters from the PCI or PCI-X slots.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Failing adapter <b>Note:</b> If an error LED is lit on the PCI-X board or on an adapter, reseat that adapter first; if no LEDs are lit, reseat each adapter one at a time, restarting the server each time, to isolate the failing adapter.</li> <li>b. (Trained service technician only) PCI-X board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>



- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
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Error code	Description	Action
01295085	ECC checking hardware test error.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor</li> <li>DIMM</li> <li>Microprocessor tray</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor</li> <li>DIMM</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
01298001	No update data for processor 1.	<ol style="list-style-type: none"> <li>Make sure that all microprocessors have the same cache size (see “Configuration/Setup Utility menu choices” on page 133).</li> <li>Update the BIOS code again (see “Updating the firmware” on page 131).</li> <li>(Trained service technician only) Reseat microprocessor 1.</li> <li>(Trained service technician only) Replace microprocessor 1.</li> </ol>
01298002	No update data for processor 2.	<ol style="list-style-type: none"> <li>Make sure that all microprocessors have the same cache size (see “Configuration/Setup Utility menu choices” on page 133).</li> <li>Update the BIOS code again (see “Updating the firmware” on page 131).</li> <li>(Trained service technician only) Reseat microprocessor 2.</li> <li>(Trained service technician only) Replace microprocessor 2.</li> </ol>
01298004	No update data for processor 3.	<ol style="list-style-type: none"> <li>Make sure that all microprocessors have the same cache size (see “Configuration/Setup Utility menu choices” on page 133).</li> <li>Update the BIOS code again (see “Updating the firmware” on page 131).</li> <li>(Trained service technician only) Reseat microprocessor 3.</li> <li>(Trained service technician only) Replace microprocessor 3.</li> </ol>

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- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
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Error code	Description	Action
01298005	No update data for processor 4.	<ol style="list-style-type: none"> <li>1. Make sure that all microprocessors have the same cache size (see “Configuration/Setup Utility menu choices” on page 133).</li> <li>2. Update the BIOS code again (see “Updating the firmware” on page 131).</li> <li>3. (Trained service technician only) Reseat microprocessor 4.</li> <li>4. (Trained service technician only) Replace microprocessor 4.</li> </ol>
01298101	Bad update data for processor 1.	<ol style="list-style-type: none"> <li>1. Make sure that all microprocessors have the same cache size (see “Configuration/Setup Utility menu choices” on page 133).</li> <li>2. Update the BIOS code again (see “Updating the firmware” on page 131).</li> <li>3. (Trained service technician only) Reseat microprocessor 1.</li> <li>4. (Trained service technician only) Replace microprocessor 1.</li> </ol>
01298102	Bad update data for processor 2.	<ol style="list-style-type: none"> <li>1. Make sure that all microprocessors have the same cache size (see “Configuration/Setup Utility menu choices” on page 133).</li> <li>2. Update the BIOS code again (see “Updating the firmware” on page 131).</li> <li>3. (Trained service technician only) Reseat microprocessor 2.</li> <li>4. (Trained service technician only) Replace microprocessor 2.</li> </ol>
01298103	Bad update data for processor 3.	<ol style="list-style-type: none"> <li>1. Make sure that all microprocessors have the same cache size (see “Configuration/Setup Utility menu choices” on page 133).</li> <li>2. Update the BIOS code again (see “Updating the firmware” on page 131).</li> <li>3. (Trained service technician only) Reseat microprocessor 3.</li> <li>4. (Trained service technician only) Replace microprocessor 3.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
01298104	Bad update data for processor 4.	<ol style="list-style-type: none"> <li>1. Make sure that all microprocessors have the same cache size (see “Configuration/Setup Utility menu choices” on page 133).</li> <li>2. Update the BIOS code again (see “Updating the firmware” on page 131).</li> <li>3. (Trained service technician only) Reseat microprocessor 4.</li> <li>4. (Trained service technician only) Replace microprocessor 4.</li> </ol>
01298200	Processor speed mismatch.	Make sure that all microprocessors have the same cache size (see “Configuration/Setup Utility menu choices” on page 133).
I9990301	Fixed disk sector error.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Hard disk drive</li> <li>b. SAS hard disk drive backplane</li> <li>c. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
I9990305	An operating system was not found.	<ol style="list-style-type: none"> <li>1. Make sure that a bootable operating system is installed.</li> <li>2. Run the hard disk drive diagnostic tests.</li> <li>3. Reseat the following components: <ol style="list-style-type: none"> <li>a. Hard disk drive</li> <li>b. SAS hard disk drive backplane and cables</li> <li>c. DVD drive and cables</li> <li>d. I/O board</li> </ol> </li> <li>4. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li> </ol>
I9990650	AC power has been restored.	<ol style="list-style-type: none"> <li>1. Check the power cables.</li> <li>2. Check for interruption of the power supply (see “Power-supply LEDs” on page 53).</li> <li>3. Reseat the following components: <ol style="list-style-type: none"> <li>a. Power supply</li> <li>b. (Trained service technician only) Power backplane</li> </ol> </li> <li>4. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li> </ol>

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## Checkout procedure

The checkout procedure is the sequence of tasks that you should follow to diagnose a problem in the server.

### About the checkout procedure

Before performing the checkout procedure for diagnosing hardware problems, review the following information:

- Read the safety information beginning on page vii.
- The diagnostics programs provide the primary methods of testing the major components of the server, for example, the I/O board, Ethernet controller, keyboard, mouse (pointing device), serial ports, and hard disk drives. You can also use them to test some external devices. If you are not sure whether a problem is caused by the hardware or by the software, you can use the diagnostics programs to confirm that the hardware is working correctly.
- When you run the diagnostics programs, a single problem might cause several error messages. If you receive several error messages, correct the cause of the first error message. The other error messages might not occur the next time you run the diagnostics programs.
- Before running the diagnostics programs, you must determine whether the failing server is part of a shared hard disk drive cluster (two or more servers sharing external storage devices). If it is part of a cluster, you can run all diagnostics programs except the ones that test the storage unit (that is, a hard disk drive in the storage unit) or the storage adapter that is attached to the storage unit. The failing server might be part of a cluster if any of the following conditions is true:
  - You have identified the failing server as part of a cluster (two or more servers sharing external storage devices).
  - 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:** If the server is 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 might enable the hard disk drive diagnostic tests.

- If the server is suspended and a POST error code is displayed, see “Error logs” on page 16. If the server is suspended and no error message is displayed, see “Problem isolation tables” on page 33 and “Solving undetermined problems” on page 88.
- For information about power-supply problems, see “Solving power problems” on page 86 and “Power-supply LEDs” on page 53.
- For intermittent problems, check the error log; see “Error logs” on page 16 and “Diagnostic programs, messages, and error codes” on page 55.

### Performing the checkout procedure

To perform the checkout procedure, complete the following steps:

- |            |  |
|------------|--|
| <b>001</b> | <b>IS THE SERVER PART OF A CLUSTER?</b>  |
| <b>002</b> | <b>No.</b> Go to step <b>004</b> .   |
| <b>003</b> | <b>Yes.</b> Schedule maintenance. Shut down all failing systems that are related to the cluster. Go to step <b>004</b> . |

**004**

- Turn off the server and all external devices.
- Check all cables and power cords.
- Set all display controls to the middle positions.
- Turn on all external devices.
- Turn on the server.
- Check the operator information panel system-error LED; if it is flashing, check the light path diagnostics LEDs (see “Light path diagnostics” on page 46).
- Check for the following correct responses:
  - A single beep.
  - Readable instructions on the main menu.

#### **DID YOU RECEIVE THE CORRECT RESPONSES?**

**005**

**No.** Find the failure symptom in “Problem isolation tables”; if necessary, see “Solving undetermined problems” on page 88.

**006**

**Yes.** Run the diagnostic programs (see “Running the on-board diagnostic programs” on page 56).

- If you receive an error, see “Diagnostic error codes” on page 57.
- If the diagnostics programs were completed successfully and you still suspect a problem, see “Solving undetermined problems” on page 88.

If the server does not turn on, see “Problem isolation tables.”

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## **(Trained service technicians only) Checkpoint codes**

Checkpoint codes give the check that was taking place at the time the system stopped; they do not provide error codes or suggested replacement parts. The checkpoint display will indicate where the server has stopped without waiting for the video to initialize at each startup during problem isolation.

There are two types of checkpoint codes: CPLD hardware checkpoint codes, and BIOS checkpoint codes. The BIOS checkpoint codes might change when the BIOS code is updated.

The checkpoint display for the xSeries 366 is located on the I/O board.

Checkpoint codes can be found at  
<http://w3.pc.ibm.com/helpcenter/infotips/techinfo/MIGR-58350.html>.

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## **Problem isolation tables**

Use the problem isolation tables to find solutions to problems that have definite symptoms.

If you cannot find the problem in the error symptom charts, go to “Running the on-board diagnostic programs” on page 56 to test the server.

If you have just added new software or a new option and the server is not working, use the following procedures before using the problem isolation tables:

1. Check the light path diagnostics LEDs on the operator information panel (see “Light path diagnostics” on page 46).
2. Remove the software or device that you just added.

3. Run the diagnostic tests to determine whether the server is running correctly.
4. Reinstall the new software or new device.

## CD or DVD drive problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
The CD or DVD drive is not recognized.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The IDE channel to which the CD or DVD 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 or DVD drive.</li> </ul> </li> <li>2. Run the CD or DVD drive diagnostic programs.</li> <li>3. Reseat the following components: <ol style="list-style-type: none"> <li>a. CD or DVD drive</li> <li>b. CD or DVD drive cable</li> <li>c. I/O board</li> </ol> </li> <li>4. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li> </ol>
A CD or DVD is not working correctly.	<ol style="list-style-type: none"> <li>1. Clean the CD or DVD.</li> <li>2. Run the CD or DVD drive diagnostic programs.</li> <li>3. Reseat the CD or DVD drive.</li> <li>4. Replace the CD or DVD drive.</li> </ol>
The CD or DVD drive tray is not working.	<ol style="list-style-type: none"> <li>1. Make sure that the server is turned on.</li> <li>2. Insert the end of a straightened paper clip into the manual tray-release opening.</li> <li>3. Reseat the CD or DVD drive.</li> <li>4. Replace the CD or DVD drive.</li> </ol>

## General problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
A cover lock is broken, an LED is not working, or a similar problem has occurred.	If the part is a CRU, replace it. If the part is a FRU, the part must be replaced by a trained service technician.

## Hard disk drive problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
Not all drives are recognized by the hard disk drive diagnostic test (the Fixed Disk test).	Remove the drive indicated on the diagnostic tests; then, run the hard disk drive diagnostic test again. If the remaining drives are recognized, replace the drive that you removed with a new one.
The server stops responding during the hard disk drive diagnostic test.	Remove the hard disk drive that was being tested when the server stopped responding, and run the diagnostic test again. If the hard disk drive diagnostic test runs successfully, replace the drive that you removed with a new one.
A hard disk drive was not detected while the operating system was being started.	Reseat all hard disk drives and cables; then, run the hard disk drive diagnostic tests again.

## Intermittent problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
A problem occurs only occasionally and is difficult to diagnose.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• All cables and cords are connected securely to the rear of the server and attached devices.</li> <li>• When the server is turned on, air is flowing from the fan grille. If there is no airflow, the fan is not working. This can cause the server to overheat and shut down.</li> </ul> </li> <li>2. Check the system-error log or BMC log (see “Error logs” on page 16).</li> </ol>

## Keyboard, mouse, or pointing-device problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
All or some keys on the keyboard do not work.	<ol style="list-style-type: none"> <li>1. If the server is attached to a KVM switch, make sure the switch is working correctly by plugging the keyboard cable directly into the correct port on the rear of the server, thus bypassing the KVM switch.</li> <li>2. Make sure that: <ul style="list-style-type: none"> <li>• The keyboard cable is securely connected to the server and the keyboard and mouse cables are not reversed.</li> <li>• The server and the monitor are turned on.</li> </ul> </li> <li>3. Reseat the following components: <ol style="list-style-type: none"> <li>a. Keyboard</li> <li>b. I/O board</li> </ol> </li> <li>4. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li> </ol>
The mouse or pointing device does not work.	<ol style="list-style-type: none"> <li>1. If the server is attached to a KVM switch, make sure the switch is working correctly by plugging the mouse or pointing device cable directly into the correct port on the rear of the server, thus bypassing the KVM switch.</li> <li>2. Make sure that: <ul style="list-style-type: none"> <li>• The mouse or pointing-device cable is securely connected and the keyboard and mouse cables are not reversed.</li> <li>• The mouse device drivers are installed correctly.</li> <li>• The mouse is enabled in the Configuration/Setup Utility program</li> </ul> </li> <li>3. Reseat the following components: <ol style="list-style-type: none"> <li>a. Mouse or pointing device</li> <li>b. I/O board</li> </ol> </li> <li>4. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li> </ol>



## USB keyboard, mouse, or pointing-device problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
All or some keys on the keyboard do not work.	<ol style="list-style-type: none"> <li>1. If you have installed a USB keyboard, run the Configuration/Setup Utility program and enable keyboardless operation to prevent the POST error message 301 from being displayed during startup.</li> <li>2. Make sure that: <ul style="list-style-type: none"> <li>• The keyboard cable is securely connected and the keyboard and mouse cables are not reversed.</li> <li>• The server and the monitor are turned on.</li> </ul> </li> <li>3. Reseat the following components: <ol style="list-style-type: none"> <li>a. Keyboard</li> <li>b. I/O board</li> </ol> </li> <li>4. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li> </ol>
The USB mouse or USB pointing device does not work.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The mouse or pointing-device USB cable is securely connected to the server, the keyboard and mouse or pointing-device cables are not reversed, and the device drivers are installed correctly.</li> <li>• The server and the monitor are turned on.</li> <li>• Keyboardless operation has been enabled in the Configuration/Setup Utility program.</li> </ul> </li> <li>2. If a USB hub is in use, disconnect the USB device from the hub and connect it directly to the server.</li> <li>3. Reseat the following components: <ol style="list-style-type: none"> <li>a. Mouse or pointing device</li> <li>b. I/O board</li> </ol> </li> <li>4. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li> </ol>

## Memory problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Symptom	Action
<p>The amount of system memory that is displayed is less than the amount of installed physical memory.</p>	<ol style="list-style-type: none"> <li>1. Make sure that:               <ul style="list-style-type: none"> <li>• No error LEDs are lit on the operator information panel or on the memory card.</li> <li>• Memory mirroring does not account for the discrepancy.</li> <li>• The memory modules are seated correctly.</li> <li>• You have installed the correct type of memory.</li> <li>• If you changed the memory, you updated the memory configuration in the Configuration/Setup Utility program.</li> <li>• All banks of memory are enabled. The server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.</li> </ul> </li> <li>2. Check the POST error log for error message 289:               <ul style="list-style-type: none"> <li>• If a DIMM was disabled by a system-management interrupt (SMI), replace the DIMM.</li> <li>• If a DIMM was disabled by the user or by POST, run the Configuration/Setup Utility program and enable the DIMM.</li> </ul> </li> <li>3. Run memory diagnostics (see “Running the on-board diagnostic programs” on page 56).</li> <li>4. Make sure there is no memory mismatch when the server is at the minimum memory configuration (two 1GB DIMMs; see “Minimum configuration” on page 88).</li> <li>5. Add one pair of DIMMs at a time, making sure the DIMMs match for each pair added.</li> <li>6. Add one memory card at a time, making sure the memory matches for each card added.</li> <li>7. Reseat the following components:               <ol style="list-style-type: none"> <li>a. DIMM</li> <li>b. Memory card</li> </ol> </li> <li>8. Replace the components listed in step 7 one at a time, in the order shown, restarting the server each time.</li> </ol>

## Microprocessor problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Symptom	Action
The server emits a continuous beep during POST, indicating that the startup (boot) microprocessor is not working correctly.	<ol style="list-style-type: none"> <li>1. Correct any errors indicated by the light path (see “Light path diagnostics” on page 46).</li> <li>2. Make sure that all microprocessors are supported on this server, and that they all match in speed and cache size.</li> <li>3. (Trained service technician only) Make sure that the microprocessor 1 is seated correctly.</li> <li>4. Reseat the following components: <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor 1</li> <li>b. Microprocessor VRM 3 or 4</li> <li>c. Microprocessor tray</li> </ol> </li> <li>5. (Trained service technicians only) If there is no indication of which microprocessor has failed, isolate the error by testing with one microprocessor at a time.</li> <li>6. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor 1</li> <li>b. Microprocessor VRM 3 or 4</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> <li>7. (Trained service technician only) If there are multiple microprocessor, light path, or error codes that indicate a damaged microprocessor, switch two microprocessors to see if the error moves with the microprocessor or if it stays with the microprocessor socket. <p><b>Note:</b> For sockets 3 and 4, if the error stays with the socket, switch the VRM3 and VRM4.</p> <ul style="list-style-type: none"> <li>• If the error moved with the microprocessor, replace the microprocessor.</li> <li>• If the error moved with the VRM, replace the VRM.</li> <li>• If the error stayed at the same socket, replace the microprocessor tray.</li> </ul> </li> </ol>

## Monitor problems

Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, see the documentation that comes with the monitor for instructions for testing and adjusting the monitor. If you cannot diagnose the problem, call for service.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Symptom	Action
Testing the monitor	<ol style="list-style-type: none"> <li>1. Make sure the monitor cables are firmly connected.</li> <li>2. Try using a different monitor on the server, or try using the monitor being tested on a different server.</li> <li>3. Run the diagnostic programs. If the monitor passes the diagnostic programs, the problem might be a video device driver.</li> <li>4. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Remote Supervisor Adapter II SlimLine, if present</li> <li>b. I/O board</li> </ol> </li> <li>5. Replace the components listed in step 4 one at a time, in the order shown, restarting the server each time.</li> </ol>
The screen is blank.	<ol style="list-style-type: none"> <li>1. If the server is attached to a KVM switch, make sure the switch is working correctly by plugging the monitor cable directly into the correct port on the rear of the server, thus bypassing the KVM switch.</li> <li>2. Make sure that:               <ul style="list-style-type: none"> <li>• The server is powered on. If there is no power to the server, see “Power problems” on page 43.</li> <li>• The monitor cables are connected correctly.</li> <li>• The monitor is turned on and the brightness and contrast controls are adjusted correctly.</li> <li>• Make sure that no beep codes sounded when the server is turned on.</li> </ul> <p><b>Important:</b> In some memory configurations, the 3-3-3 beep code might sound during POST, followed by a blank monitor screen. If this occurs and the <b>Boot Fail Count</b> option in the <b>Start Options</b> of the Configuration/Setup Utility program is enabled, you must restart the server three times to reset the configuration settings to the default configuration (the memory connector or bank of connectors enabled).</p> </li> <li>3. Make sure that the correct server is controlling the monitor, if applicable.</li> <li>4. Make sure that damaged BIOS code is not affecting the video; see “Recovering from a BIOS update failure” on page 75.</li> <li>5. Observe the checkpoint LEDs on the I/O board; if the codes are changing, go to the next step. If the codes are not changing, see “(Trained service technicians only) Checkpoint codes” on page 33.</li> <li>6. See “Solving undetermined problems” on page 88.</li> </ol>
The monitor works when you turn on the server, but the screen goes blank when you start some application programs.	<ol style="list-style-type: none"> <li>1. Make sure that:               <ul style="list-style-type: none"> <li>• The application program is not setting a display mode that is higher than the capability of the monitor.</li> <li>• You installed the necessary device drivers for the application.</li> </ul> </li> <li>2. Run video diagnostics (see “Running the on-board diagnostic programs” on page 56).               <ul style="list-style-type: none"> <li>• If the video diagnostics pass, the video is good; see “Solving undetermined problems” on page 88.</li> <li>• (Trained service technician only) If the video diagnostics fail, reseat the I/O board.</li> <li>• Replace the I/O board.</li> </ul> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Symptom	Action
The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.	<ol style="list-style-type: none"> <li>1. If the monitor self-tests show the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. <b>Attention:</b> Moving a color monitor while it is turned on might cause screen discoloration. Move the device and the monitor at least 305 mm (12 in.) apart, and turn on the monitor. <b>Notes:</b> <ol style="list-style-type: none"> <li>a. To prevent diskette drive read/write errors, make sure that the distance between the monitor and any external diskette drive is at least 76 mm (3 in.).</li> <li>b. Non-IBM monitor cables might cause unpredictable problems.</li> </ol> </li> <li>2. Reseat the following components:           <ol style="list-style-type: none"> <li>a. Monitor</li> <li>b. Remote Supervisor Adapter II SlimLine, if present</li> <li>c. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
Wrong characters appear on the screen.	<ol style="list-style-type: none"> <li>1. If the wrong language is displayed, update the BIOS code (see “Updating the firmware” on page 131) with the correct language.</li> <li>2. Reseat the following components:           <ol style="list-style-type: none"> <li>a. Monitor</li> <li>b. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>

## Optional-device problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
An IBM optional device that was just installed does not work.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The device is designed for the server (see the ServerProven® list on the World Wide Web at <a href="http://www.ibm.com/us/compat/">http://www.ibm.com/us/compat/</a>).</li> <li>• You followed the installation instructions that came with the device.</li> <li>• The device is installed correctly.</li> <li>• You have not loosened any other installed devices or cables.</li> <li>• You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or any other device is changed, you must update the configuration.</li> </ul> </li> <li>2. Reseat the device that you just installed.</li> <li>3. Replace the device that you just installed.</li> </ol>
An IBM optional device that used to work does not work now.	<ol style="list-style-type: none"> <li>1. Make sure that all of the hardware and cable connections for the device are secure.</li> <li>2. If the device comes with test instructions, use those instructions to test the device.</li> <li>3. If the failing device is a SCSI device, make sure that: <ul style="list-style-type: none"> <li>• The cables for all external SCSI devices are connected correctly.</li> <li>• The last device in each SCSI chain, or the end of the SCSI cable, is terminated correctly.</li> <li>• Any external SCSI device is turned on. You must turn on an external SCSI device before turning on the server.</li> </ul> </li> <li>4. Reseat the failing device.</li> <li>5. Replace the failing device.</li> </ol>

## Power problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Symptom	Action
<p>The power-on button does not work, and the reset button does work (the server does not turn on).</p> <p><b>Note:</b> The power button will not function until 20 seconds after ac power has been applied to the server.</p>	<ol style="list-style-type: none"> <li>1. Make sure that the operator information panel power-control button is working correctly:               <ol style="list-style-type: none"> <li>a. Disconnect the server power cords.</li> <li>b. Reconnect the power cords.</li> <li>c. (Trained service technician only) Reseat the operator information panel cables, and then repeat steps 1a and 1b.                   <ul style="list-style-type: none"> <li>• (Trained service technician only) If the server turns on, reseat the operator information panel. If the problem persists, replace the operator information panel.</li> <li>• If the server does not turn on, bypass the operator information panel power-control button by using the force power-on jumper (see “I/O board internal connectors and jumpers” on page 7); if the server turns on, reseat the operator information panel. If the problem persists, replace the operator information panel.</li> </ul> </li> </ol> </li> <li>2. Make sure that the reset button is working correctly:               <ol style="list-style-type: none"> <li>a. Disconnect the server power cords.</li> <li>b. Reconnect the power cords.</li> <li>c. (Trained service technician only) Reseat the light path panel cable, and then repeat steps 1a and 1b.                   <ul style="list-style-type: none"> <li>• (Trained service technician only) If the server turns on, replace the light path panel.</li> <li>• If the server does not turn on, go to step 3.</li> </ul> </li> </ol> </li> <li>3. Make sure that:               <ul style="list-style-type: none"> <li>• The power cords are correctly connected to the server and to a working electrical outlet.</li> <li>• The type of memory that is installed is correct.</li> <li>• The memory card is fully seated.</li> <li>• The LEDs on the power supply do not indicate a problem.</li> <li>• The microprocessors are installed in the correct sequence.</li> </ul> </li> <li>4. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Memory card</li> <li>b. (Trained service technician only) Power switch connector</li> <li>c. (Trained service technician only) Power backplane</li> <li>d. I/O board</li> </ol> </li> <li>5. Replace the components listed in step 4 one at a time, in the order shown, restarting the server each time.</li> <li>6. If you just installed an optional device, remove it, and restart the server. If the server now turns on, you might have installed more devices than the power supply supports.</li> <li>7. See “Power-supply LEDs” on page 53.</li> <li>8. See “Solving undetermined problems” on page 88.</li> </ol>

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
The server does not turn off.	<ol style="list-style-type: none"> <li>1. Determine whether you are using an Advanced Configuration and Power Management (ACPI) or a non-ACPI operating system. If you are using a non-ACPI operating system, complete the following steps: <ol style="list-style-type: none"> <li>a. Press Ctrl+Alt+Delete.</li> <li>b. Turn off the server by holding the power-control button for 5 seconds.</li> <li>c. Restart the server.</li> <li>d. If the server fails POST and the power-control button does not work, disconnect the ac power cord for 20 seconds; then, reconnect the ac power cord and restart the server.</li> </ol> </li> <li>2. If the problem remains or if you are using an ACPI-aware operating system, suspect the I/O board.</li> </ol>
The server unexpectedly shuts down, and the LEDs on the operator information panel are not lit.	See “Solving undetermined problems” on page 88.

## Serial port problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
The number of serial ports that are identified by the operating system is less than the number of installed serial ports.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• Each port is assigned a unique address in 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. Reseat the serial port adapter.</li> <li>3. Replace the serial port adapter.</li> </ol>
A serial device does not work.	<ol style="list-style-type: none"> <li>1. Make sure that: <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 “System-board layouts” on page 7).</li> </ul> </li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Failing serial device</li> <li>b. Serial cable</li> <li>c. Remote Supervisor Adapter II SlimLine, if present</li> <li>d. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>



## ServerGuide problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
The <i>ServerGuide™ Setup and Installation</i> CD will not start.	<ul style="list-style-type: none"> <li>• Make sure that the server supports the ServerGuide program and has a startable (bootable) CD or DVD drive.</li> <li>• If the startup (boot) sequence settings have been changed, make sure that the CD or DVD drive is first in the startup sequence.</li> <li>• If more than one CD or DVD drive is installed, make sure that only one drive is set as the primary drive. Start the CD from the primary drive.</li> </ul>
The ServeRAID Manager program cannot view all installed drives, or the operating system cannot be installed.	<ul style="list-style-type: none"> <li>• Make sure that the hard disk drive is connected correctly.</li> <li>• Make sure that the SAS hard disk drive cables are securely connected.</li> </ul>
The operating-system installation program continuously loops.	Make more space available on the hard disk.
The ServerGuide program will not start the operating-system CD.	Make sure that the operating-system CD is supported by the ServerGuide program. See the <i>ServerGuide Setup and Installation</i> CD label for a list of supported operating-system versions.
The operating system cannot be installed; the option is not available.	Make sure that the server supports the operating system. If it does, either no logical drive is defined (SCSI RAID systems), or the ServerGuide System Partition is not present. Run the ServerGuide program and make sure that setup is complete.

## Software problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
You suspect a software problem.	<ol style="list-style-type: none"> <li>1. To determine whether the problem is caused by the software, make sure that: <ul style="list-style-type: none"> <li>• The server has the minimum memory that is needed to use the software. For memory requirements, see the information that comes with the software. <p><b>Note:</b> If you have just installed an adapter or memory, the server might have a memory-address conflict.</p> </li> <li>• The software is designed to operate on the server.</li> <li>• Other software works on the server.</li> <li>• The software works on another server.</li> </ul> </li> <li>2. If you received any error messages when using the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem.</li> <li>3. Contact your place of purchase of the software.</li> </ol>

## Universal Serial Bus (USB) port problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Symptom	Action
A USB device does not work.	<ol style="list-style-type: none"><li>1. Run USB diagnostics (see “Running the on-board diagnostic programs” on page 56).</li><li>2. Make sure that:<ul style="list-style-type: none"><li>• The correct USB device driver is installed.</li><li>• The operating system supports USB devices.</li></ul></li><li>3. If a standard PS/2<sup>®</sup> keyboard or mouse is connected, any USB keyboard or mouse will not work during POST.</li><li>4. Make sure that the USB configuration options are set correctly in the Configuration/Setup Utility program menu (see the <i>User's Guide</i> for more information).</li><li>5. If you are using a USB hub, disconnect the USB device from the hub and connect it directly to the server.</li></ol>

## Video problems

See “Monitor problems” on page 39.

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## Light path diagnostics

Light path diagnostics provides a path that you can follow to help you identify the source of an error. The server must be connected to a power source for the LEDs inside the server to be lit; the server does not have to be turned on for the LEDs to be lit.

Press the reset 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.

The server is designed so that LEDs remain lit when the server is connected to an ac power source but is not turned on, provided that the power supply is operating correctly. This feature helps you to isolate the problem when the operating system is shut down.

Any PCI-X, memory, microprocessor, and VRM LED can be lit again without ac power after you remove the microprocessor tray so that you can isolate a problem. After ac power has been removed from the server, power remains available to these LEDs for up to 24 hours.

To view the PCI-X, memory, microprocessor, and VRM LEDs, press and hold the light-path-diagnostics button on the PCI-X board, memory card, or microprocessor board for 30 seconds to light the error LEDs.

The LEDs that were lit while the server was running will be lit again while the button is pressed.

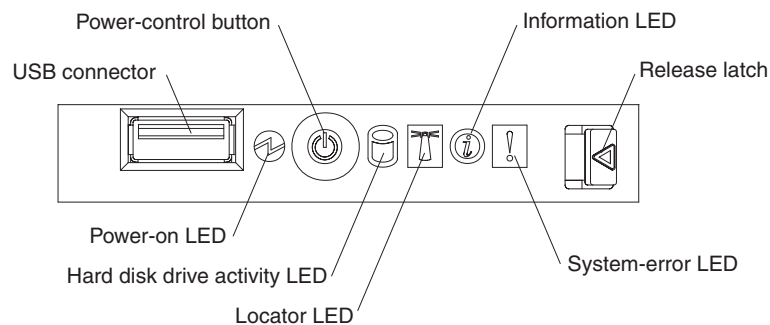
Many errors are first indicated by a lit information LED or system-error LED on the operator information panel on the front of the server. If one or both of these LEDs are lit, one or more LEDs elsewhere in the server might also be lit and can direct you to the source of the error.

**Note:** Read the safety information beginning on page vii and “Handling static-sensitive devices” on page 98.

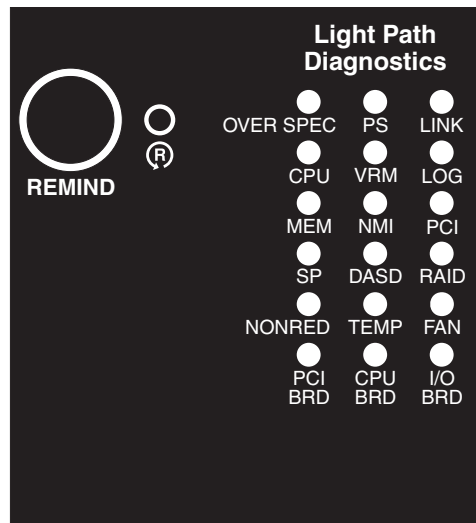
View the LEDs in the following order:

1. Check the operator information panel on the front of the server.
  - If the information LED is lit, it indicates that information about a suboptimal condition in the server is available in the BMC log or in the system-error log.
  - If the system-error LED is lit, it indicates that an error has occurred; go to step 2.

The following illustration shows the operator information panel.



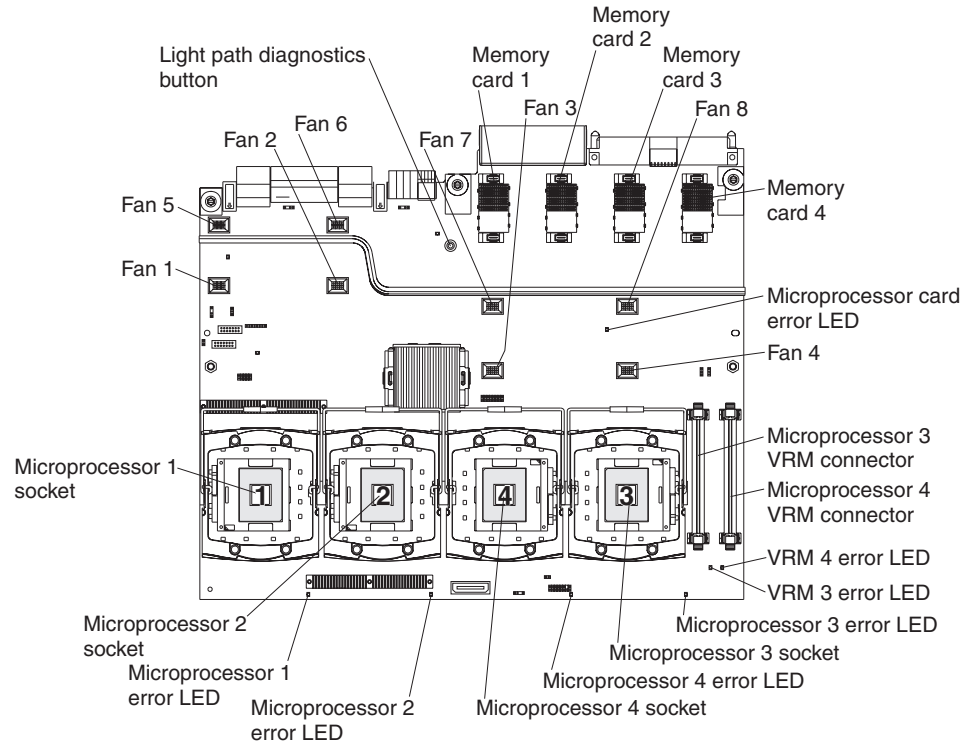
2. To view the light path diagnostics panel, press the release latch on the front of the operator information panel to the left; then, slide it forward. This reveals the light path diagnostics panel. Lit LEDs on this panel indicate the type of error that has occurred.



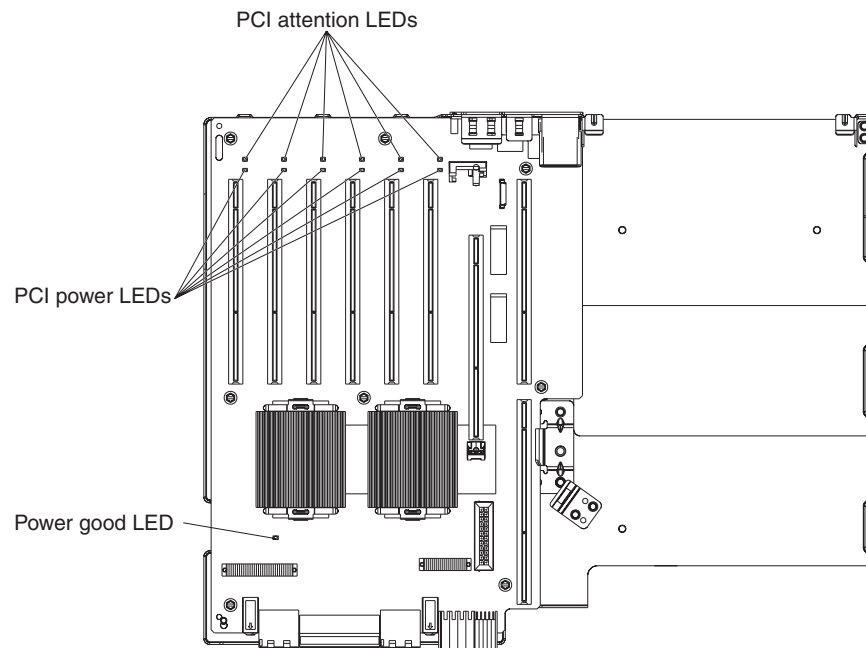
Look at the system service label on the top of the server, which gives an overview of internal components that correspond to the LEDs on the light path diagnostics panel. This information and the information in “Light path diagnostic LEDs” on page 49 can often provide enough information to correct the error.

- Remove the server cover and look inside the server for lit LEDs. Certain components inside the server have LEDs that will be lit to indicate the location of a problem. For example, a VRM error will light the LED next to the failing VRM on the microprocessor tray.

The following illustration shows the LEDs and connectors on the microprocessor tray.



The following illustration shows the LEDs on the PCI-X board.



## Light path diagnostic LEDs

The following tables describe the LEDs on the light path diagnostics panel and on the boards inside the server and suggested actions to correct the detected problems.

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>		
Lit light path diagnostics LED with the system-error or system-information LED also lit	Description	Action
All LEDs off (the power LED is lit; the information LED might be lit).		No action necessary.
OVERSPEC	There is insufficient power to power the system. The NON RED and LOG LEDs might also be lit.	<ol style="list-style-type: none"> <li>1. Add an optional power supply if only one power supply is installed.</li> <li>2. Use 220 VAC input power.</li> <li>3. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Power supply</li> <li>b. (Trained service technician only) Power backplane</li> </ol> </li> <li>4. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li> <li>5. Use 220 VAC instead of 110 VAC.</li> </ol>
PS	A power supply has failed or has been removed; also see “Power-supply LEDs” on page 53. <b>Note:</b> In a redundant power configuration, the dc power LED on one power supply might be off.	<ol style="list-style-type: none"> <li>1. Reinstall the removed power supply.</li> <li>2. Check the individual power-supply LEDs to find the failing power supply.</li> <li>3. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Failing power supply</li> <li>b. (Trained service technician only) Power backplane</li> </ol> </li> <li>4. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li> <li>5. If a 240 VA fault has occurred, ac power must be removed before dc power can be restored.</li> </ol>
LINK	Reserved	

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Lit light path diagnostics LED with the system-error or system-information LED also lit	Description	Action
CPU	<p>A microprocessor has failed, is missing, or has been improperly installed.</p> <p><b>Note:</b> Make sure that the microprocessors are installed in the correct sequence; see “Removing and installing a microprocessor” on page 122.</p>	<ol style="list-style-type: none"> <li>1. Check the BMC log or the system-error log to determine the reason for the lit LED.</li> <li>2. Find the failing, missing, or mismatched microprocessor by checking the LEDs on the microprocessor tray.</li> <li>3. Reseat the following components:               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Failing microprocessor</li> <li>b. Microprocessor tray</li> </ol> </li> <li>4. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Failing microprocessor</li> <li>b. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
VRM	<p>A dc-dc regulator has failed or is missing.</p>	<ol style="list-style-type: none"> <li>1. Check the BMC log or the system-error log to determine the reason for the lit LED (for a VRM).</li> <li>2. Find the failing or missing VRM by checking the LEDs on the microprocessor tray.</li> <li>3. Install any missing VRMs.</li> <li>4. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Failing VRM</li> <li>b. (Trained service technician only) Microprocessor associated with the VRM</li> <li>c. Microprocessor tray</li> </ol> </li> <li>5. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. Failing VRM</li> <li>b. (Trained service technician only) Microprocessor associated with the VRM</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
LOG	<p>Information is present in the BMC log and system-error log. One or both logs may be full or close to full.</p>	<ol style="list-style-type: none"> <li>1. The system-error log is 75% full; save the log if necessary and clear it (see Error Logs at “Configuration/Setup Utility menu choices” on page 133).</li> <li>2. Check the log for possible errors (see “Error logs” on page 16).</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Lit light path diagnostics LED with the system-error or system-information LED also lit	Description	Action
MEM	Memory failure. <b>Note:</b> The error LED on the memory card is also lit.	<ol style="list-style-type: none"> <li>1. Remove the memory card with the lit error LED on the top of the card; then, press the light path button on the memory card to identify the failed card or DIMM.</li> <li>2. Reseat the DIMM.</li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. Memory card</li> <li>b. DIMM</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
NMI	A hardware error has been reported to the operating system. <b>Note:</b> The PCI or MEM LED might also be lit.	<ol style="list-style-type: none"> <li>1. See the BMC log and the system-error log (see “Error logs” on page 16).</li> <li>2. If the PCI LED is lit, follow the instructions for that LED.</li> <li>3. If the MEM LED is lit, follow the instructions for that LED.</li> <li>4. Restart the server.</li> </ol>
PCI	A PCI adapter has failed. <b>Note:</b> The error LED next to the failing adapter on the PCI-X board is also lit.	<ol style="list-style-type: none"> <li>1. See the BMC log or the system-error log (see “Error logs” on page 16).</li> <li>2. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Failing adapter</li> <li>b. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
SP	There is a fault in the Remote Supervisor Adapter II SlimLine.	<ol style="list-style-type: none"> <li>1. Reseat the Remote Supervisor Adapter II SlimLine.</li> <li>2. Update the firmware for the Remote Supervisor Adapter II SlimLine (see “Updating the firmware” on page 131).</li> <li>3. Replace the Remote Supervisor Adapter II SlimLine.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Lit light path diagnostics LED with the system-error or system-information LED also lit	Description	Action
DASD	A hard disk drive has failed or has been removed. <b>Note:</b> The error LED on the failing hard disk drive is also lit.	<ol style="list-style-type: none"> <li>1. Reinstall the removed drive.</li> <li>2. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Failing hard disk drive</li> <li>b. SAS hard disk drive backplane</li> <li>c. SAS 6x cable</li> <li>d. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
RAID	The RAID adapter (ServeRAID 8i) has indicated a fault.	<ol style="list-style-type: none"> <li>1. See the BMC log or the system-error log (see “Error logs” on page 16).</li> <li>2. Reseat the following components:               <ol style="list-style-type: none"> <li>a. RAID adapter</li> <li>b. Hard disk drives</li> <li>c. I/O board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
NONRED	The server is operating with nonredundant power. If a power supply or its ac power source fails, the system will be over spec. <b>Note:</b> The LOG LED might also be lit.	<ol style="list-style-type: none"> <li>1. If the PS LED on the light path diagnostics panel is lit, follow the instructions for that LED.</li> <li>2. Replace the failing power supply.</li> <li>3. Remove optional devices.</li> <li>4. Use 220 VAC instead of 110 VAC.</li> </ol>
TEMP	A system temperature or component has exceeded specifications. <b>Note:</b> A fan LED might also be lit.	<ol style="list-style-type: none"> <li>1. See the BMC log or the system-error log (see “Error logs” on page 16) for the source of the fault.</li> <li>2. Make sure that the airflow of the server is not blocked.</li> <li>3. If a fan LED is lit, reseat the fan.</li> <li>4. Replace the fan for which the LED is lit.</li> <li>5. Make sure that the room is neither too hot nor too cold (see “Environment” in “Features and specifications” on page 3).</li> <li>6. If one of the VRDs indicates “hot,” ac power must be removed before dc power can be restored.</li> </ol>



<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>		
Lit light path diagnostics LED with the system-error or system-information LED also lit	Description	Action
FAN	A fan has failed or has been removed. <b>Note:</b> A failing fan can also cause the TEMP LED to be lit.	<ol style="list-style-type: none"> <li>1. Reinstall the removed fan.</li> <li>2. If an individual fan LED is lit, replace the fan.</li> <li>3. Reseat the microprocessor tray.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
PCI BRD	The PCI-X board has failed.	<ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the PCI-X board assembly.</li> <li>2. (Trained service technician only) Replace the PCI-X board assembly.</li> </ol>
CPU BRD	The microprocessor tray has failed.	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
I/O BRD	The I/O board has failed.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>

## Remind button

You can use the remind button to put the system-error LED on the operator information panel into Remind mode. When you press the remind button, you acknowledge the error but indicate that you will not take immediate action. The system-error LED flashes while it is in Remind mode.

The system-error LED stays in Remind mode until one of the following conditions occurs:

- All known errors are corrected.
- The server is restarted.
- A new error occurs (the LED is lit again).

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## Power-supply LEDs

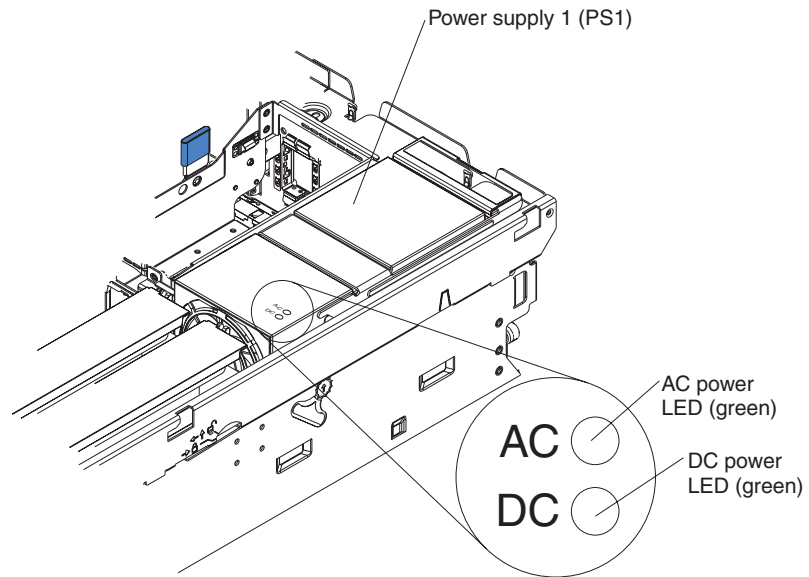
The following table describes the power-supply LEDs and suggested actions to correct the detected problems.

The following minimum configuration is required for the power-supply dc good LED to be lit:

- Power supply
- Power backplane
- Power cord
- Microprocessor tray

The following minimum configuration is required for the server to turn on:

- One microprocessor
- Two 1 GB DIMMs on the memory card
- One power supply
- Power backplane
- Power cord
- I/O board
- PCI-X board assembly



- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Power-supply LEDs		Operator information panel power LED	Description	Action
AC good	DC good			
Off	Off	Off	No power to the server, or a problem with the ac power source.	<ol style="list-style-type: none"> <li>1. Check the ac power to the server.</li> <li>2. Make sure that the power cord is connected to a functioning power source.</li> <li>3. Remove one power supply at a time.</li> </ol>
Lit	Off	Off	DC source power problem	<ol style="list-style-type: none"> <li>1. Make sure that the microprocessor tray is connected to the power backplane.</li> <li>2. Remove one power supply at a time.</li> <li>3. View the system-error log (see “Error logs” on page 16).</li> </ol>
Lit	Lit	Off	Standby power problem	<ol style="list-style-type: none"> <li>1. View the system-error log (see “Error logs” on page 16).</li> <li>2. Isolate by removing one power supply at a time.</li> <li>3. (Trained service technician only) Replace the power backplane.</li> </ol>
Lit	Lit	Flashing	System power-on problem	<ol style="list-style-type: none"> <li>1. View the system-error log (see “Error logs” on page 16).</li> <li>2. Press the power-control button on the operator information panel.</li> <li>3. (Trained service technician only) Use the force-power-on jumper as a debugging aid (see “I/O board internal connectors and jumpers” on page 7) to determine whether the information panel switch and cable are faulty.</li> <li>4. Remove the optional Remote Supervisor Adapter II SlimLine, and try to turn on the server.</li> <li>5. Reseat the microprocessor tray.</li> <li>6. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
Lit	Lit	Lit	The power is good.	No action.

## Diagnostic programs, messages, and error codes

The server diagnostic programs are the primary method of testing the major components of the server.

As you run the diagnostic programs, text messages and error codes are displayed on the screen and are saved in the test log. A diagnostic text message or error code indicates that a problem has been detected; to determine what action you should take as a result of a message or error code, see the table in “Diagnostic error codes” on page 57.

## Real-time diagnostics

Real-time diagnostics can help you diagnose certain devices on xSeries servers while the operating system is running. Using these diagnostic actions, you can prevent and minimize server downtime.

For more information and to download the real-time diagnostics, go to the following Web page:

<http://www-1.ibm.com/support/docview.wss?uid=psg1MIGR-50681>

## Running the on-board diagnostic programs

To run the on-board diagnostic programs, complete the following steps:

1. If the server is running, turn off the server and all attached devices.
2. Turn on all attached devices; then, turn on the server.
3. When the prompt F2 for Diagnostics appears, press F2. If you have set both a power-on password and an administrator password, you must type the administrator password to run the diagnostic programs.
4. From the top of the screen, select either **Extended** or **Basic**.
5. From the diagnostic programs screen, select the test that you want to run, and follow the instructions on the screen.

To determine what action you should take as a result of a diagnostic text message or error code, see the table in “Diagnostic error codes” on page 57.

A single problem might cause several text messages or error codes. When this occurs, correct the cause of the first message or error code. The other messages and error codes usually will not occur the next time you run the test.

For help with the diagnostic programs, press F1. 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, press Esc.

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.

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

If no mouse or a USB mouse is attached to the server, you cannot use the **Next Cat** and **Prev Cat** buttons to select categories. All other mouse-selectable functions are available through function keys.

You can use the regular keyboard test to test a USB keyboard, and you can use the regular mouse test to test a USB mouse. You can run the USB interface test only if no USB devices are attached. The USB test will not run if a Remote Supervisor Adapter II SlimLine is installed.

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

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

## Diagnostic text messages

Diagnostic text messages are displayed while the tests are running. A diagnostic text message contains one of the following results:

**Passed:** The test was completed without any errors.

**Failed:** The test detected 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:** The test could not be run. There was no failure of the hardware that was being tested, but there might be a hardware failure elsewhere, or another problem prevented the test from running; for example, there might be a configuration problem, or the hardware might be missing or is not being recognized.

The result is followed by an error code or other additional information about the error.

## Viewing the test log

To view the test log when the tests are completed, select **Utility** from the top of the screen and then select **View Test Log**. The test-log data is maintained only while you are running the diagnostic programs. When you exit from the diagnostic programs, the test log is cleared.

To save the test log to a file on a diskette or to the hard disk, click **Save Log** on the diagnostic programs screen and specify a location and name for the saved log file.

### Notes:

1. To create and use a diskette, you must add an optional external diskette drive to the server.
2. To save the test log to a diskette, you must use a diskette that you have formatted yourself; this function does not work with preformatted diskettes. If the diskette has sufficient space for the test log, the diskette can contain other data.

## Diagnostic error codes

The following table describes the error codes that the diagnostic programs might generate and suggested actions to correct the detected problems.

If the diagnostic programs generate error codes that are not listed in the table, make sure that the latest levels of BIOS, Remote Supervisor Adapter II SlimLine, and ServeRAID code are installed.

In the error codes, x can be any numeral or letter. However, if the three-digit number in the central position of the code is 000, 195, or 197, *do not* replace a CRU or FRU. These numbers appearing in the central position of the code have the following meanings:

- 000** The server passed the test. Do not replace a CRU or FRU.
- 195** The Esc key was pressed to end the test. Do not replace a CRU or FRU.
- 197** This is a warning error, but it does not indicate a hardware failure; do not replace a CRU or FRU. Take the action indicated in the “Action” column but *do not replace a CRU or a FRU*. See the description for **Warning** in the section “Diagnostic text messages” on page 57 for more information.

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>		
Error code	Description	Action
001-198-000	Test aborted.	<ol style="list-style-type: none"> <li>1. Check the system-error log and the BMC log for messages indicating the cause of the error, and take the indicated action.</li> <li>2. From the diagnostic programs, run Quick Memory Test All Banks; then, if an error is detected, take the indicated action.</li> <li>3. Reinstall and, if necessary, update the BIOS code on the server; then, rerun the test (see “Updating the firmware” on page 131).</li> </ol>
001-250-00x	Test failed, where <ul style="list-style-type: none"> <li>• x of 0 = ECC logic on I/O board</li> <li>• x of 1 = ECC logic on memory card</li> </ul>	<ol style="list-style-type: none"> <li>1. Check the system-error log and the BMC log for messages indicating the cause of the error, and take the indicated action.</li> <li>2. From the diagnostic programs, run Quick Memory Test All Banks; then, if an error is detected, take the indicated action.</li> <li>3. From the diagnostic programs, rerun the ECC test; then, if an error is detected, take the indicated action.</li> <li>4. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Memory card</li> <li>b. I/O board</li> </ol> </li> <li>5. Replace the components listed in step 4 one at a time, in the order shown, restarting the server each time.</li> </ol>
001-292-000	Core system: failed/CMOS checksum failed.	Load the BIOS default settings using the Configuration/Setup Utility program and run the test again (see “Configuration/Setup Utility menu choices” on page 133).
001-xxx-000	Failed core tests.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
001-xxx-001	Failed core tests.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
005-xxx-000	Failed video test.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
011-xxx-000	Failed COM1 serial port test.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
015-xxx-001	Failed USB test.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
015-xxx-015	Failed USB external loopback test.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
015-xxx-198	Remote Supervisor Adapter II SlimLine installed <i>or</i> USB device connected during USB test.	<ol style="list-style-type: none"> <li>1. If a Remote Supervisor Adapter II SlimLine is installed as an option, remove it and run the test again.</li> <li>2. Remove all USB devices and run the test again.</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
020-xxx-000	Failed PCI Interface test.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. (Trained service technician only) PCI-X switch card assembly</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
020-xxx-001	Failed hot-swap slot 1 PCI latch test.	<ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the PCI-X switch card assembly.</li> <li>2. (Trained service technician only) Replace the PCI-X switch card assembly.</li> </ol>
020-xxx-002	Failed hot-swap slot 2 PCI latch test.	<ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the PCI-X switch card assembly.</li> <li>2. (Trained service technician only) Replace the PCI-X switch card assembly.</li> </ol>
020-xxx-003	Failed hot-swap slot 3 PCI latch test.	<ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the PCI-X switch card assembly.</li> <li>2. (Trained service technician only) Replace the PCI-X switch card assembly.</li> </ol>
020-xxx-004	Failed hot-swap slot 4 PCI latch test.	<ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the PCI-X switch card assembly.</li> <li>2. (Trained service technician only) Replace the PCI-X switch card assembly.</li> </ol>
020-xxx-005	Failed hot-swap slot 5 PCI latch test.	<ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the PCI-X switch card assembly.</li> <li>2. (Trained service technician only) Replace the PCI-X switch card assembly.</li> </ol>
020-xxx-006	Failed hot-swap slot 6 PCI latch test.	<ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the PCI-X switch card assembly.</li> <li>2. (Trained service technician only) Replace the PCI-X switch card assembly.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
030-265-001	Communication Error.	<ol style="list-style-type: none"> <li>1. Update the microcode for the Serial Attached SCSI (SAS) controller (see “Updating the firmware” on page 131).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
030-266-001	Eight SAS/SATA Channel Error.	<ol style="list-style-type: none"> <li>1. Update the microcode for the Serial Attached SCSI (SAS) controller (see “Updating the firmware” on page 131).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
030-267-001	Central Management Seq error.	<ol style="list-style-type: none"> <li>1. Update the microcode for the Serial Attached SCSI (SAS) controller (see “Updating the firmware” on page 131).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
030-268-001	Link m Cntrl 0 Sequencer error.	<ol style="list-style-type: none"> <li>1. Update the microcode for the Serial Attached SCSI (SAS) controller (see “Updating the firmware” on page 131).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
030-269-001	Link m Cntrl 1 Sequencer error.	<ol style="list-style-type: none"> <li>1. Update the microcode for the Serial Attached SCSI (SAS) controller (see “Updating the firmware” on page 131).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
030-270-001	On Chip Memory access error.	<ol style="list-style-type: none"> <li>1. Update the microcode for the Serial Attached SCSI (SAS) controller (see “Updating the firmware” on page 131).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>



- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
030-271-001	SRAM access error.	<ol style="list-style-type: none"> <li>1. Update the microcode for the Serial Attached SCSI (SAS) controller (see “Updating the firmware” on page 131).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
030-272-001	NVRAM access error.	<ol style="list-style-type: none"> <li>1. Update the microcode for the Serial Attached SCSI (SAS) controller (see “Updating the firmware” on page 131).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
030-273-001	FLASH access error.	<ol style="list-style-type: none"> <li>1. Update the microcode for the Serial Attached SCSI (SAS) controller (see “Updating the firmware” on page 131).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
030-274-001	Base Addr Register Key error.	<ol style="list-style-type: none"> <li>1. Update the microcode for the Serial Attached SCSI (SAS) controller (see “Updating the firmware” on page 131).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
030-xxx-00n	Failed SCSI test on PCI slot n where n represents the slot number of the failing adapter.	<ol style="list-style-type: none"> <li>1. Check the BMC log or system-error log before replacing a CRU or FRU (see “Error logs” on page 16).</li> <li>2. Reseat and, if necessary, replace the adapter in slot n.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
035-002-0nn	ServeRAID interface timeout.	<ol style="list-style-type: none"> <li>1. The ServeRAID controller might not be configured correctly. Obtain the basic and extended configuration status bytes and see the <i>ServeRAID Hardware Maintenance Manual</i> for more information.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. SAS hard disk drive backplane cables</li> <li>b. ServeRAID controller</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
035-253-0nn	ServeRAID controller 0nn initialization failure; 0nn = the controller number.	<ol style="list-style-type: none"> <li>1. The ServeRAID controller might not be configured correctly. See the <i>ServeRAID Hardware Maintenance Manual</i> for more information.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. SAS hard disk drive backplane cables</li> <li>b. ServeRAID controller</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
035-253-s99	RAID adapter initialization failure.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. ServeRAID adapter</li> <li>b. SAS hard disk drive backplane cable</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
035-254-0nn	Setup error; unable to allocate memory to run test.	Check the system resources and make more memory available (see “Configuration/Setup Utility menu choices” on page 133); then, run the test again.
035-255-0nn	Internal error.	<ol style="list-style-type: none"> <li>1. Reseat the SAS hard disk drive backplane cable.</li> <li>2. Replace the SAS hard disk drive backplane.</li> </ol>
035-260-0nn	System to controller interface failure.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. ServeRAID adapter</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
035-265-0nn	Adapter Communication error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
035-266-0nn	Adapter CPU test error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>
035-267-0nn	Adapter Local RAM test error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>
035-268-0nn	Adapter NVSRAM test error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>
035-269-0nn	Adapter Cache test error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>
035-271-0nn	Adapter XOR engine test error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>
035-272-0nn	Adapter Drive test error.	Replace the attached drive.
035-273-0nn	Adapter Drive error.	Replace the attached drive.
035-274-0nn	Adapter Parameters set error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>
035-275-001	Adapter Communication error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>
035-276-001	Adapter CPU test error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>
035-277-001	Adapter Local RAM test error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
035-278-001	Adapter NVSRAM test error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>
035-279-001	Adapter Cache test error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>
035-280-001	Adapter Drive test error.	Replace the attached drive.
035-281-001	Adapter Drive error.	Replace the attached drive.
035-282-001	Adapter Parameters set error.	<ol style="list-style-type: none"> <li>1. Update the RAID controller firmware (see “Updating the firmware” on page 131).</li> <li>2. Reseat and, if necessary, replace the RAID controller.</li> </ol>
035-283-001	Adapter Battery error.	Replace the battery module on the RAID controller.
035-xxx-cnn	c = ServeRAID channel number, nn = SCSI ID of failing fixed disk drive.	<ol style="list-style-type: none"> <li>1. Check the BMC log or system-error log before replacing a FRU.</li> <li>2. Reseat and, if necessary, replace the hard disk drive on channel C, SCSI ID nn.</li> </ol>
035-xxx-snn	nn = SCSI ID of failing fixed disk.	<ol style="list-style-type: none"> <li>1. Check the BMC log or system-error log before replacing a FRU.</li> <li>2. Reseat and, if necessary, replace the SCSI disk with ID nn on adapter in slot s</li> </ol>
075-xxx-000	Failed power supply test.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Power supply</li> <li>b. (Trained service technician only) Power backplane</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
089-xxx-001	Failed microprocessor test.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor 1</li> <li>b. Microprocessor tray</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor 1</li> <li>b. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
089-xxx-002	Failed optional microprocessor test.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor 2</li> <li>Microprocessor tray</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor 2</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
089-xxx-003	Failed microprocessor test.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor 3</li> <li>VRM 3</li> <li>Microprocessor tray</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor 3</li> <li>VRM 3</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
089-xxx-004	Failed microprocessor test.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor 4</li> <li>VRM 4</li> <li>Microprocessor tray</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor 4</li> <li>VRM 4</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
155-xxx-xxx	Failed Active Memory™ latch test.	<ol style="list-style-type: none"> <li>Reseat the memory card.</li> <li>Replace the memory card.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
166-051-000	System Management: Failed. Unable to communicate with ASM. It may be busy. Run the test again.	<ol style="list-style-type: none"> <li>1. Update the firmware (BIOS, service processor, and diagnostics; see “Updating the firmware” on page 131).</li> <li>2. Run the diagnostic test again.</li> <li>3. Correct other error conditions (including failed systems-management tests and items that are logged in the Remote Supervisor Adapter II SlimLine system-error log) and retry.</li> <li>4. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect the power cords, and retry.</li> <li>5. Reseat the Remote Supervisor Adapter II SlimLine.</li> <li>6. Replace the Remote Supervisor Adapter II SlimLine.</li> </ol>
166-060-000	System Management: Failed. Unable to communicate with ASM. It may be busy. Run the test again.	<ol style="list-style-type: none"> <li>1. Update the firmware (BIOS, service processor, and diagnostics; see “Updating the firmware” on page 131).</li> <li>2. Run the diagnostic test again.</li> <li>3. Correct other error conditions (including failed systems-management tests and items that are logged in the Remote Supervisor Adapter II SlimLine system-error log) and retry.</li> <li>4. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect the power cords, and retry.</li> <li>5. Reseat the Remote Supervisor Adapter II SlimLine.</li> <li>6. Replace the Remote Supervisor Adapter II SlimLine.</li> </ol>
166-070-000	System Management: Failed. Unable to communicate with ASM. It may be busy. Run the test again.	<ol style="list-style-type: none"> <li>1. Update the firmware (BIOS, service processor, and diagnostics; see “Updating the firmware” on page 131).</li> <li>2. Run the diagnostic test again.</li> <li>3. Correct other error conditions (including failed systems-management tests and items that are logged in the Remote Supervisor Adapter II SlimLine system-error log) and retry.</li> <li>4. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect the power cords, and retry.</li> <li>5. Reseat the Remote Supervisor Adapter II SlimLine.</li> <li>6. Replace the Remote Supervisor Adapter II SlimLine.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
166-198-000	BIOS cannot detect ASM. Reseat ASM adapter in correct slot; ASM restart failure. Unplug and cold boot server to reset ASM.	<ol style="list-style-type: none"> <li>1. Run the diagnostic test again.</li> <li>2. Correct other error conditions (including other failed systems-management tests and items that are logged in the Remote Supervisor Adapter II SlimLine system-error log) and retry.</li> <li>3. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect the power cords, and retry.</li> <li>4. Reseat the following components: <ol style="list-style-type: none"> <li>a. Remote Supervisor Adapter II SlimLine</li> <li>b. I/O board</li> </ol> </li> <li>5. Replace the components listed in step 4 one at a time, in the order shown, restarting the server each time.</li> </ol>
166-201-000	ISMP indicates I2C errors on bus X.	Reseat and, if necessary, replace the I/O board.
166-201-001	ISMP indicates I2C errors on bus P.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. (Trained service technician only) Power backplane</li> <li>b. I/O board</li> <li>c. Microprocessor tray</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> <li>a. (Trained service technician only) Power backplane</li> <li>b. I/O board</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
166-201-002	ISMP indicates I2C errors on bus I.	Reseat and, if necessary, replace the I/O board.
166-201-003	ISMP indicates I2C errors on bus C.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Microprocessor tray</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor tray</li> <li>b. I/O board</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
166-201-004	ISMP indicates I2C errors on bus M.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>I/O board</li> <li>Memory card</li> <li>Microprocessor tray</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>I/O board</li> <li>Memory card</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
166-201-005	ISMP indicates I2C errors on bus S.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>SAS hard disk drive backplane cables</li> <li>I/O board</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>SAS hard disk drive backplane</li> <li>I/O board</li> </ol> </li> </ol>
166-201-006	ISMP indicates I2C errors on bus O.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>(Trained service technician only) Operator information panel</li> <li>I/O board</li> </ol> </li> <li>Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
166-201-007	ISMP indicates I2C errors on bus M0.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>Memory card</li> <li>I/O board</li> <li>Microprocessor tray</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>Memory card</li> <li>I/O board</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>



- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
166-201-008	ISMP indicates I2C errors on bus M1.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Memory card</li> <li>b. I/O board</li> <li>c. Microprocessor tray</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> <li>a. Memory card</li> <li>b. I/O board</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
166-260-000	ASM restart failure.	<ol style="list-style-type: none"> <li>1. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect the power cords, and retry.</li> <li>2. Reseat the Remote Supervisor Adapter II SlimLine.</li> <li>3. Replace the Remote Supervisor Adapter II SlimLine.</li> </ol>
166-342-000	System management BIST indicates failed tests.	<ol style="list-style-type: none"> <li>1. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect the power cords, and retry.</li> <li>2. Reseat the Remote Supervisor Adapter II SlimLine.</li> <li>3. Replace the Remote Supervisor Adapter II SlimLine.</li> </ol>
166-400-000	ISMP Self Test Result failed tests: xxx where xxx=flash, ROM, or RAM.	<ol style="list-style-type: none"> <li>1. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect the power cords, and retry.</li> <li>2. Update the BMC firmware (see “Updating the firmware” on page 131).</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
166-400-100	DMC Self Test Result failed tests: xxx where xxx=flash, ROM, or RAM.	<ol style="list-style-type: none"> <li>1. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect the power cords, and retry.</li> <li>2. Update the BIOS code, BMC, service processor, and diagnostics firmware (see “Updating the firmware” on page 131).</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
180-197-000	SCSI ASPI driver not installed.	<ol style="list-style-type: none"> <li>1. Remove the RAID adapter, if one is installed, and run the test again.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. SAS hard disk drive backplane cables</li> <li>b. I/O board</li> <li>c. Microprocessor tray</li> </ol> </li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> <li>a. SAS hard disk drive backplane</li> <li>b. I/O board</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
180-361-003	Failed fan LED test.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Fan</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed above one at a time, in the order listed above, restarting the server each time.</li> </ol>
180-xxx-000	Diagnostics LED failure.	Run the diagnostic LED test for the failing LED.
180-xxx-001	Failed front LED panel test.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. (Trained service technician only) Operator information panel</li> <li>b. I/O board</li> <li>c. Microprocessor tray</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> <li>a. (Trained service technician only) Operator information panel</li> <li>b. I/O board</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
180-xxx-002	Failed diagnostics LED panel test.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>(Trained service technician only) Operator information panel</li> <li>I/O board</li> <li>Microprocessor tray</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>(Trained service technician only) Operator information panel</li> <li>I/O board</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
180-xxx-005	Failed SCSI backplane LED test.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>SAS hard disk drive backplane cable</li> <li>I/O board</li> <li>Microprocessor tray</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>SAS hard disk drive backplane cable</li> <li>SAS hard disk drive backplane</li> <li>I/O board</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
180-xxx-006	Failed memory card LED test.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>Memory card</li> <li>Microprocessor tray</li> <li>I/O board</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>Memory card</li> <li>(Trained service technician only) Microprocessor tray</li> <li>I/O board</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
180-xxx-007	Failed power supply fan LED test.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Power supply</li> <li>b. (Trained service technician only) Power supply structure</li> <li>c. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
180-xxx-008	Failed I/O board LED test.	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
180-xxx-009	Failed Active™ PCI LED test.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. (Trained service technician only) PCI-X switch card assembly</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
201-198-000	Memory Test Aborted: Could not run the test; suspect microprocessor tray error.	<ol style="list-style-type: none"> <li>1. Restart the server.</li> <li>2. Run the diagnostic test again.</li> <li>3. Reinstall the diagnostic programs (see “Updating the firmware” on page 131).</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
201-198-00n	Memory Test Aborted: Could not run the test. <b>Note:</b> n = 1-9 (programming error).	<ol style="list-style-type: none"> <li>1. Restart the server.</li> <li>2. Run the diagnostic test again.</li> <li>3. Reinstall the diagnostic programs (see “Updating the firmware” on page 131).</li> </ol>
201-xxx-CBN	Failed Memory Test: See “Memory module” on page 105. <ul style="list-style-type: none"> <li>• C = memory card [1-4]</li> <li>• B = physical bank [1-2] <b>Note:</b> Bank 1 = DIMMs 1 and 3; Bank 2 = DIMMs 2 and 4</li> <li>• N = failing DIMM [1-4]</li> </ul>	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. DIMM N</li> <li>b. Memory card C</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol> <p><b>Note:</b> N = 9 indicates both DIMMs in physical bank B and memory card C.</p>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
202-xxx-00n	Failed system cache test.	<ol style="list-style-type: none"> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor n</li> <li>Microprocessor tray</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>(Trained service technician only) Microprocessor n</li> <li>(Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
204-198-000	Test aborted.	<ol style="list-style-type: none"> <li>Run the Quick Memory Test Diagnostic All Banks (see “Running the on-board diagnostic programs” on page 56).</li> <li>Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>Look in the test log (see “Viewing the test log” on page 57) and correct any other errors.</li> </ol>
204-210-000	Test failed.	<ol style="list-style-type: none"> <li>Run the Quick Memory Test Diagnostic All Banks (see “Running the on-board diagnostic programs” on page 56).</li> <li>Update the BIOS code (see “Updating the firmware” on page 131).</li> <li>Look in the test log (see “Viewing the test log” on page 57) and correct any other errors.</li> </ol>
215-xxx-000	Failed CD or DVD test.	<ol style="list-style-type: none"> <li>Run the test again with a different CD or DVD.</li> <li>Reseat the following components:               <ol style="list-style-type: none"> <li>CD or DVD drive</li> <li>Front panel assembly</li> </ol> </li> <li>Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>CD or DVD drive</li> <li>(Trained service technician only) Front panel assembly</li> </ol> </li> </ol>
217-xxx-000	Failed BIOS fixed disk test. <b>Note:</b> If RAID is configured, the fixed disk number refers to the RAID logical array.	Reseat and, if necessary, replace hard disk drive 1.
217-xxx-001	Failed BIOS fixed disk test. <b>Note:</b> If RAID is configured, the fixed disk number refers to the RAID logical array.	Reseat and, if necessary, replace hard disk drive 2.
217-xxx-002	Failed BIOS fixed disk test. <b>Note:</b> If RAID is configured, the fixed disk number refers to the RAID logical array.	Reseat and, if necessary, replace hard disk drive 3.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

Error code	Description	Action
217-xxx-003	Failed BIOS fixed disk test. <b>Note:</b> If RAID is configured, the fixed disk number refers to the RAID logical array.	Reseat and, if necessary, replace hard disk drive 4.
217-xxx-004	Failed BIOS fixed disk test. <b>Note:</b> If RAID is configured, the fixed disk number refers to the RAID logical array.	Reseat and, if necessary, replace hard disk drive 5.
217-xxx-005	Failed BIOS fixed disk test. <b>Note:</b> If RAID is configured, the fixed disk number refers to the RAID logical array.	Reseat and, if necessary, replace hard disk drive 6.
217-198-xxx	Could not establish drive parameters.	<ol style="list-style-type: none"> <li>1. Check the drive cables and terminators.</li> <li>2. Reseat and, if necessary, replace the hard disk drive.</li> </ol>
301-xxx-000	Failed keyboard test. <b>Note:</b> After installing a USB keyboard, you might have to use the Configuration/Setup Utility program to enable keyboardless operation and prevent the POST error message 301 from being displayed during startup.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Keyboard</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
302-xxx-xxx	Failed mouse test.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Mouse</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
305-xxx-xxx	Failed video monitor test.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. Monitor</li> <li>b. I/O board</li> </ol> </li> <li>2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.</li> </ol>
405-xxx-000	Failed Ethernet test on controller on I/O board.	<ol style="list-style-type: none"> <li>1. Make sure that Ethernet is not disabled in the Configuration/Setup Utility program and that the BIOS code is at the latest level.</li> <li>2. Run the loopback diagnostic.</li> <li>3. Reseat the I/O board.</li> <li>4. Replace the I/O board.</li> </ol>
405-xxx-00n	No good link! Check loopback plug.	<ol style="list-style-type: none"> <li>1. Make sure that the loopback plug is a gigabit loopback plug (see “Solving Ethernet controller problems” on page 87).</li> <li>2. Check for any loose connections between the loopback plug and the Ethernet connector.</li> </ol>

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## Recovering from a BIOS update failure

If the BIOS code in the server has become damaged, such as from a power failure during an update, your server has an advanced recovery feature that will automatically switch to a backup BIOS page.

The flash memory of the server consists of a primary page and a backup page. If the BIOS code in the primary page is damaged, the onboard baseboard management controller will detect the error and automatically switch to the backup page to start the server. In this event, a POST warning message “Booted from backup POST/BIOS image” will be displayed.

**Note:** The backup page version may not be the same version as the primary image.

You can then recover or restore the original primary page BIOS by using the BIOS flash diskette.

**Note:** To create and use a diskette, you must add an optional external diskette drive to the server.

To recover the BIOS code and restore the server operation to the primary bank, complete the following steps:

1. Download the latest version of the BIOS code from <http://www.ibm.com/pc/support/>.
2. Update the BIOS code, following the instructions that come with the update file that you downloaded. This will automatically restore/update the primary page.
3. Restart the server.

In the event that the above sequence fails, the server might not restart correctly or might not display video. Complete the following steps to force a manual restore operation:

1. Read the safety information beginning on page vii and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the cover.
3. Locate the boot block recovery jumper (J14 on the I/O board) (see “I/O board internal connectors and jumpers” on page 7).
4. Remove ac power from the server.
5. Move the J14 jumper to pins 2 and 3 to enable the backup page.
6. Wait 30 seconds, then reapply ac power to the server.
7. Insert the BIOS flash diskette into the external diskette drive.
8. Restart the server.
9. When POST starts, select **1 - Update POST/BIOS** from the menu that contains various flash (update) options.
10. When you are asked whether you want to save the current code to a diskette, type N.
11. Type 1 and press Enter to continue.  
**Attention:** Do not restart or power-off the server until the update is completed.
12. When the update is completed, turn off the server.
13. Remove ac power from the server.

14. Move the J14 jumper back to pins 1 and 2 to return to startup from the primary page.
15. Wait 30 seconds, then reapply ac power to the server.
16. Replace the cover; then, restart the server.

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## System-error log messages

A system-error log is generated only if a Remote Supervisor Adapter II SlimLine is installed. The system-error log can contain messages of three types:

- Information** Information messages do not require action; they record significant system-level events, such as when the server is started.
- Warning** Warning messages do not require immediate action; they indicate possible problems, such as when the recommended maximum ambient temperature is exceeded.
- Error** Error messages might require action; they indicate system errors, such as when a fan is not detected.

Each message contains date and time information, and it indicates the source of the message (POST/BIOS or the service processor).

**Note:** The BMC log, which you can view through the Configuration/Setup Utility program, also contains a large number of information, error, and warning messages.

In the following example, the system-error log message indicates that the server was turned on at the recorded time.

```

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

```

The following table describes the possible system-error log messages and suggested actions to correct the detected problems.

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
System-error log message	Action
1.5V Calgary PLL Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Reseat the microprocessor tray.</li> <li>3. (Trained service technician only) Replace the PCI-X board.</li> </ol>
1.5V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board</li> <li>2. Reseat the microprocessor tray.</li> <li>3. (Trained service technician only) Replace the PCI-X board.</li> </ol>



- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

System-error log message	Action
1.8V Calgary 1 HSSIB Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Reseat the microprocessor tray.</li> <li>3. (Trained service technician only) Replace the PCI-X board.</li> </ol>
1.8V Calgary 2 HSSIB Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Reseat the microprocessor tray.</li> <li>3. (Trained service technician only) Replace the PCI-X board.</li> </ol>
1.8V Fault	<ol style="list-style-type: none"> <li>1. If the light path diagnostics VRM LED is lit, replace the failing VRM 3 or 4.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Microprocessor tray</li> <li>b. Power supply</li> <li>c. Power backplane</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
2.5V Calgary HSSIB Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Reseat the microprocessor tray.</li> <li>3. (Trained service technician only) Replace the PCI-X board.</li> </ol>
2.5V Calgary PLL Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Reseat the microprocessor tray.</li> <li>3. (Trained service technician only) Replace the PCI-X board.</li> </ol>
3.3V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the Remote Supervisor Adapter II SlimLine, if present.</li> <li>2. Reseat the I/O board.</li> <li>3. (Trained service technician only) Replace the PCI-X board.</li> </ol>
5V Aux Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. (Trained service technician only) Disconnect the cable connecting the operator information panel to the I/O board.</li> <li>3. Replace the I/O board.</li> <li>4. (Trained service technician only) Replace the PCI-X board.</li> </ol>
5V Power Good Fault	<p>Disconnect the monitor and all USB devices from the server; then:</p> <ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Reseat the microprocessor tray.</li> <li>3. (Trained service technician only) Replace the PCI-X board.</li> </ol>
12V A Bus Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. Replace the PCI-X board.</li> <li>3. Replace the power backplane</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

System-error log message	Action
12V B Bus Fault	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Disk drives</li> <li>b. SAS hard disk drive backplane cables</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. Disk drives</li> <li>b. SAS hard disk drive backplane</li> <li>c. (Trained service technician only) Power backplane</li> <li>d. (Trained service technician only) PCI-X board</li> </ol> </li> </ol>
12V C Bus Fault	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. PCI or PCI-X adapters</li> <li>b. Microprocessor tray</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. PCI or PCI-X adapters</li> <li>b. (Trained service technician only) PCI-X board</li> <li>c. (Trained service technician only) Power backplane</li> </ol> </li> </ol>
12V D Bus Fault	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Microprocessor tray</li> <li>b. Memory cards 3 and 4</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. Memory cards 3 and 4</li> <li>b. (Trained service technician only) Power backplane</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
12V E Bus Fault	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Microprocessor tray</li> <li>b. Memory cards 1 and 2</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. Memory cards 1 and 2</li> <li>b. (Trained service technician only) Power backplane</li> <li>c. (Trained service technician only) Microprocessor tray</li> </ol> </li> </ol>
12V Planar Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. Replace the power backplane.</li> </ol>
12V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. Reseat the memory cards.</li> <li>3. (Trained service technician only) Replace the power backplane.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.</li> </ul>	
System-error log message	Action
Application Posted Alert to ASM	Information only
Backplane Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. Reseat the memory cards.</li> <li>3. (Trained service technician only) Replace the power backplane.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
Board 2.5V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
Calgary Core 1.5V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Reseat the microprocessor tray.</li> <li>3. (Trained service technician only) Replace the PCI-X board.</li> </ol>
CEC Card Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. Reseat the I/O board.</li> <li>3. (Trained service technician only) Replace the PCI-X board.</li> </ol>
CPU %d IERR detected, the system has been restarted	<p>Information only; if the message persists:</p> <ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the microprocessors.</li> <li>2. Reseat the microprocessor VRMs, if present.</li> <li>3. (Trained service technician only) Replace the microprocessor.</li> </ol>
CPU %d IERR, the CPU has been disabled	<p>Information only; if the message persists:</p> <ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the microprocessors.</li> <li>2. Reseat the microprocessor VRMs, if present.</li> <li>3. (Trained service technician only) Replace the microprocessor.</li> </ol>
CPU %d non-critical over temperature warning	<ol style="list-style-type: none"> <li>1. Make sure that the fans have good airflow and are not obstructed.</li> <li>2. (Trained service technician only) Reseat the microprocessor heat sink.</li> </ol>
CPU %d non-recoverable over temperature fault	<ol style="list-style-type: none"> <li>1. Make sure that the fans have good airflow and are not obstructed.</li> <li>2. (Trained service technician only) Reseat the microprocessor heat sink.</li> </ol>
CPU removal detected	<p>Informational only; if the message persists:</p> <ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the microprocessors.</li> <li>2. Reseat the microprocessor VRMs, if present.</li> </ol>
CPU X Over Temperature	<ol style="list-style-type: none"> <li>1. Check all fans and remove any obstacles from the path of the airflow.</li> <li>2. Make sure that the room temperature is within the recommended range.</li> <li>3. Make sure that the microprocessor heat sinks are correctly seated.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

System-error log message	Action
Ethernet Data Rate modified from <value1> to <value2> by user <USERID>	Information only
Ethernet Duplex setting modified from <value1> to <value1> by user <USERID>	Information only
Ethernet interface <value> by user <USERID>	Information only
Ethernet locally administered MAC address modified from x:x:x:x:x	Information only
Ethernet MTU setting modified from x to y by user <USERID>	Information only
Fan X Failure (X of 1-8)	<ol style="list-style-type: none"> <li>1. Make sure that nothing is blocking the fan.</li> <li>2. Check the physical connection and make sure that the fan is correctly seated.</li> <li>3. Replace fan X.</li> </ol>
Fan X not detected (X of 1-8)	<ol style="list-style-type: none"> <li>1. Make sure that nothing is blocking the fan or power supply.</li> <li>2. Check the physical connection and make sure that the fan is correctly seated.</li> <li>3. Replace fan X.</li> </ol>
Front Panel is not plugged in	<ol style="list-style-type: none"> <li>1. Make sure that the operator information panel cables are correctly connected (verify LED activity).</li> <li>2. Replace the operator information panel.</li> </ol>
Hard Drive X Fault	<ol style="list-style-type: none"> <li>1. Run diagnostics.</li> <li>2. Hard disk drive</li> <li>3. SAS backplane</li> </ol>
Hard drive X removal detected	Reseat hard disk drive X and restart the server.
Hostname set to <value> by user <USERID>	Information only
Hot plug card is not plugged in	<ol style="list-style-type: none"> <li>1. Make sure that the PCI or PCI-X cables are correctly connected.</li> <li>2. Reseat the failing hot-plug cable or adapter.</li> <li>3. Replace the failing hot-plug cable or adapter.</li> </ol>
Hurricane SMI 1.2V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. Reseat the memory cards.</li> <li>3. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
Hurricane Vtt MR 1.5V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. Reseat the memory cards.</li> <li>3. (Trained service technician only) Replace the microprocessor tray.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

System-error log message	Action
Hvtt IB 1.8V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. Reseat the memory cards.</li> <li>3. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
Hvtr IB 2.5V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. Reseat the memory cards.</li> <li>3. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
I/O Card Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the Remote Supervisor Adapter II SlimLine, if present.</li> <li>2. Reseat the I/O board.</li> <li>3. Replace the I/O board.</li> <li>4. (Trained service technician only) Replace the PCI-X board.</li> </ol>
IB MR Reg 1.8V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. Reseat the memory cards.</li> <li>3. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
Invalid CPU configuration	Make sure that the microprocessors have been installed in the correct order (see “Removing and installing a microprocessor” on page 122).
Invalid Fan configuration	Replace any missing or failed fans.
IP address of default gateway modified from x.x.x.x	Information only
IP address of network interface modified from x.x.x.x	Information only
IP subnet mask of network interface modified from x.x.x.x	Information only
Loader Watchdog Triggered	<ol style="list-style-type: none"> <li>1. Reconfigure the loader watchdog timer to be a higher value (twice the normal operating-system boot time).</li> <li>2. Install the Remote Supervisor Adapter II SlimLine device driver for the operating system.</li> <li>3. Disable the loader watchdog.</li> <li>4. Check the integrity of the installed operating system.</li> <li>5. Reinstall the operating system with the applicable device drivers.</li> </ol>
Machine check asserted	<ol style="list-style-type: none"> <li>1. Reseat the memory card.</li> <li>2. Replace the memory card.</li> </ol>
Machine check asserted for Card or Link - SPINT	<ol style="list-style-type: none"> <li>1. Reseat the memory card.</li> <li>2. Replace the memory card.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

System-error log message	Action
Memory Card x inserted	Information only; if the message persists: 1. Make sure that the memory card lever is securely latched. 2. Reseat the memory card.
Memory Card x removed	Information only; if the message persists: 1. Make sure that the memory card lever is securely latched. 2. Reseat the memory card.
Multiple fan failures	Replace any missing or failed fans or power supplies.
OS Watchdog Triggered	1. Reconfigure the O/S watchdog timer to be a higher value. 2. Reinstall the Remote Supervisor Adapter II SlimLine device driver for the operating system. 3. Disable the O/S watchdog. 4. Check the integrity of the installed operating system. 5. Reinstall the operating system with applicable device drivers.
PCI-X Card Power Good Fault	1. Reseat the Remote Supervisor Adapter II SlimLine, if present. 2. Reseat the I/O board. 3. Replace the I/O board. 4. (Trained service technician only) Replace the PCI-X board.
POST Watchdog Triggered	1. Reconfigure the POST watchdog timer to be a higher value (consistent with the time it takes to complete POST). 2. Disable the POST watchdog.
Power Good Fault detected by memory card %d.	1. Reseat the memory cards. 2. Reseat the DIMMs. 3. Reseat the microprocessor tray. 4. (Trained service technician only) Replace the power backplane. 5. (Trained service technician only) Replace the microprocessor tray.
Power Supply %d Temperature Warning	1. Make sure that the power supply fans have good airflow and are not obstructed. 2. Make sure the room temperature is within the recommended range (see “Environment” at “Features and specifications” on page 3). 3. Replace the power supply.
Power supply current exceeded max spec value	1. Install another power supply (if possible) and make sure that ac power cords are correctly connected. 2. Remove devices that consume an extraordinary amount of power. 3. Replace the power backplane.
Power Supply X 12V Over Current Fault	1. Power supply 2. Power backplane

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

System-error log message	Action
Power Supply X 12V Over Voltage Fault	<ol style="list-style-type: none"> <li>1. Power supply</li> <li>2. Power backplane</li> </ol>
Power Supply X 12V Under Voltage Fault	<ol style="list-style-type: none"> <li>1. Power supply</li> <li>2. Power backplane</li> </ol>
Power Supply X AC Power Removed	<ol style="list-style-type: none"> <li>1. Connect the ac power cord to power supply X.</li> <li>2. Replace power supply X.</li> </ol>
Power Supply X Current Fault	<ol style="list-style-type: none"> <li>1. Power supply</li> <li>2. Power backplane</li> </ol>
Power Supply X DC Good Fault	<ol style="list-style-type: none"> <li>1. If the system power present LED is lit, reduce the server to the minimum configuration (see page 88) and replace components one at a time to isolate the fault.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Power supply</li> <li>b. Power backplane</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
Power Supply X Removed	<ol style="list-style-type: none"> <li>1. Reseat power supply X.</li> <li>2. Replace power supply X.</li> <li>3. Replace the power backplane.</li> </ol>
Power Supply X Temperature Fault	<ol style="list-style-type: none"> <li>1. Make sure that the fan air intake areas are clear and well ventilated.</li> <li>2. Make sure that all fans are installed and functioning.</li> <li>3. Reseat power supply X.</li> <li>4. Replace power supply X.</li> </ol>
QA Cache 1.8V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. (Trained service technician only) Reseat the microprocessors.</li> <li>3. Reseat the microprocessor VRMs, if present.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
QA Vcc PLL Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. (Trained service technician only) Reseat the microprocessors.</li> <li>3. Reseat the microprocessor VRMs, if present.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
QB Cache Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. (Trained service technician only) Reseat the microprocessors.</li> <li>3. Reseat the microprocessor VRMs, if present.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

System-error log message	Action
QB Vcc PLL Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. (Trained service technician only) Reseat the microprocessors.</li> <li>3. Reseat the microprocessor VRMs, if present.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
Remote Login Successful. Login ID:	Information only
Resetting system due to an unrecoverable error	Check the following light path diagnostics LEDs for faults: <ol style="list-style-type: none"> <li>1. Microprocessors</li> <li>2. DIMMs</li> <li>3. Memory card</li> <li>4. Microprocessor tray</li> <li>5. I/O board assembly</li> </ol>
SCSI 1.8V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
Single fan failure	Replace any missing or failed fans or power supplies.
SMI reported a Machine Check on Memory Card = %d	<ol style="list-style-type: none"> <li>1. Reseat the memory card.</li> <li>2. Replace the memory card.</li> </ol>
SMI reported a Machine Check on Memory Card %d, Dimm %d	<ol style="list-style-type: none"> <li>1. Reseat the DIMM.</li> <li>2. Reseat the memory card.</li> <li>3. Replace the DIMM.</li> </ol>
Software NMI	Make sure that the system software is operating correctly and does not conflict with other software; the system software has created a software NMI.
System Approaching Maximum Power Consumption	<ol style="list-style-type: none"> <li>1. Install another power supply (if possible) and make sure that the ac power cords are correctly connected.</li> <li>2. Remove devices that consume an extraordinary amount of power.</li> <li>3. Replace the power backplane.</li> </ol>
System Boot Failed	<ol style="list-style-type: none"> <li>1. Check the POST/BIOS boot checkpoint indicator and see the applicable documentation.</li> <li>2. Make sure that the memory card and DIMMs are correctly connected and seated and that they are functional.</li> <li>3. Attempt to start the server from the backup BIOS page.</li> </ol>
System Complex Powered Down	Information only
System Complex Powered Up	Information only
System-error log full	Clear the event log.
System log 75%% full	Information only
System Memory Error	<ol style="list-style-type: none"> <li>1. Reseat the memory adapter and DIMMs.</li> <li>2. Replace the memory.</li> </ol>



- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only)”, that step must be performed only by a trained service technician.

System-error log message	Action
System Running Nonredundant Power	<ol style="list-style-type: none"> <li>1. Install another power supply (if possible) and make sure that the ac power cords are correctly connected.</li> <li>2. Remove devices that consume an extraordinary amount of power.</li> <li>3. Replace the power backplane.</li> </ol>
User <USERID> attempting to power/reset server	Information only
Video 1.8V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
Video 2.5V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the Remote Supervisor Adapter II SlimLine, if present.</li> <li>2. Reseat the I/O board.</li> <li>3. Replace the I/O board.</li> </ol>
Video Core 1.8V Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the I/O board.</li> <li>2. Replace the I/O board.</li> </ol>
VRM X Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat VRM 3 or 4.</li> <li>2. Reseat the microprocessor tray.</li> <li>3. Replace VRM 3 or 4.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>
Vtt Power Good Fault	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor tray.</li> <li>2. (Trained service technician only) Reseat the microprocessors.</li> <li>3. Reseat the microprocessor VRMs, if present.</li> <li>4. (Trained service technician only) Replace the microprocessor tray.</li> </ol>

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## Solving SCSI problems

**Note:** This section also applies to Serial Attached SCSI (SAS) problems.

For any SCSI error message, one or more of the following devices might be causing the problem:

- A failing SCSI device (adapter, drive, or controller)
- An incorrect SCSI termination jumper setting
- Duplicate SCSI IDs in the same SCSI chain
- A missing or incorrectly installed SCSI terminator
- A defective SCSI terminator
- An incorrectly installed cable
- A defective cable

For any SCSI error message, follow these suggested actions in the order in which they are listed until the problem is solved:

1. Make sure that external SCSI devices are turned on before you turn on the server.
2. Make sure that the cables for all external SCSI devices are connected correctly.
3. If an external SCSI device is attached, make sure that the external SCSI termination is set to automatic.
4. Make sure that the last device in each SCSI chain is terminated correctly.
5. Make sure that the SCSI devices are configured correctly.

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## Solving power problems

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. Use the following general procedure for diagnosing a power problem:

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 a loose screw is causing a short circuit on a circuit board.
3. Remove the adapters and disconnect the cables and power cords to all internal and external devices until the server is at the minimum configuration that is required for the server to start (see “Minimum operating requirements” on page 88).
4. Reconnect all ac power cords and turn on the server. If the server starts successfully, replace the adapters and devices one at a time until the problem is isolated.

If the server does not start from the minimum configuration, replace the components in the minimum configuration one at a time until the problem is isolated.

To use this method, you must know the minimum configuration that is required for the server to start (see “Solving undetermined problems” on page 88).

---

## Solving Ethernet controller problems

The method that you use to test the Ethernet controller depends on which operating system you are using. Check the operating-system documentation for information about Ethernet controllers, and see the Ethernet controller device driver readme file.

Make sure that the latest device drivers are installed.

If the problem remains after you check these factors, try the following procedures:

- Make sure that the Ethernet cable is installed correctly.
  - The cable must be securely attached at all connections. If the cable is attached but the problem remains, try a different cable.
  - If you set the Ethernet controller to operate at 100 Mbps, you must use Category 5 cabling.
  - If you directly connect two servers (without a hub), or if you are not using a hub with X ports, use a crossover cable. To determine whether a hub has an X port, check the port label. If the label contains an X, the hub has an X port.
- Determine whether the hub supports auto-negotiation. If it does not, try configuring the integrated Ethernet controller manually to match the speed and duplex mode of the hub.
- Check the Ethernet controller LEDs on the rear panel of the server. These LEDs indicate whether there is a problem with the connector, cable, or hub.
  - The Ethernet link status LED is lit when the Ethernet controller receives a link pulse from the hub. If the LED is off, there might be a defective connector or cable or a problem with the hub.
  - The Ethernet transmit/receive activity LED is lit when the Ethernet controller sends or receives data over the Ethernet network. If the Ethernet transmit/receive activity light is off, make sure that the hub and network are operating and that the correct device drivers are installed.
- Check the LAN activity LED on the rear of the server. The LAN activity LED is lit when data is active on the Ethernet network. If the LAN activity LED is off, make sure that the hub and network are operating and that the correct device drivers are installed.
- Make sure that you are using the correct device drivers, which come with the server.
- Check for operating-system-specific causes for the problem.
- Make sure that the device drivers on the client and server are using the same protocol.

If the Ethernet controller still cannot connect to the network but the hardware appears to be working, the network administrator must investigate other possible sources of the error.

---

## Solving undetermined problems

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

If you suspect that a software problem is causing failures (continuous or intermittent), see “Software problems” on page 45.

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, use the password override jumper to override the power-on password and clear the CMOS memory; see “I/O board internal connectors and jumpers” on page 7. If you suspect that the BIOS code is damaged, see “Recovering from a BIOS update failure” on page 75.

Check the LEDs on all the power supplies (see “Power-supply LEDs” on page 53). If the LEDs indicate that the power supplies are working correctly, complete the following steps:

1. Turn off the server.
2. Make sure that the server is cabled correctly.
3. Remove or disconnect the following devices, one at a time, until you find the failure. Turn on the server and reconfigure it each time.
  - Any external devices.
  - Surge-suppressor device (on the server).
  - Modem, printer, mouse, and non-IBM devices.
  - Each adapter.
  - Hard disk drives.
  - Memory modules. The minimum configuration requirement is 2 GB (two 1 GB DIMMs).
  - Service processor.

The following minimum configuration is required for the server to turn on:

- One microprocessor
  - Two 1 GB DIMMs on the memory card
  - One power supply
  - Power backplane
  - Power cord
  - I/O board
  - PCI-X board
4. Turn on the server. If the problem remains, suspect the following components in the following order:
    - a. Power backplane
    - b. I/O board
    - c. Memory card
    - d. Microprocessor tray

If the problem is solved when you remove an adapter from the server but the problem recurs when you reinstall the same adapter, suspect the adapter; if the problem recurs when you replace the adapter with a different one, suspect the PCI-X board.

If you suspect a networking problem and the server passes all the system tests, suspect a network cabling problem that is external to the server.

---

## Calling IBM for service

See Appendix A, “Getting help and technical assistance,” on page 141 for information about calling IBM for service.

When you call for service, have as much of the following information available as possible:

- Machine type and model
- Microprocessor and hard disk drive upgrades
- Failure symptoms
  - Does the server fail the diagnostic programs? If so, what are the error codes?
  - What occurs? When? Where?
  - Is the failure repeatable?
  - Has the current server configuration ever worked?
  - What changes, if any, were made before it failed?
  - Is this the original reported failure, or has this failure been reported before?
- Diagnostic program type and version level
- Hardware configuration (print screen of the system summary)
- BIOS code level
- Operating-system type and version level

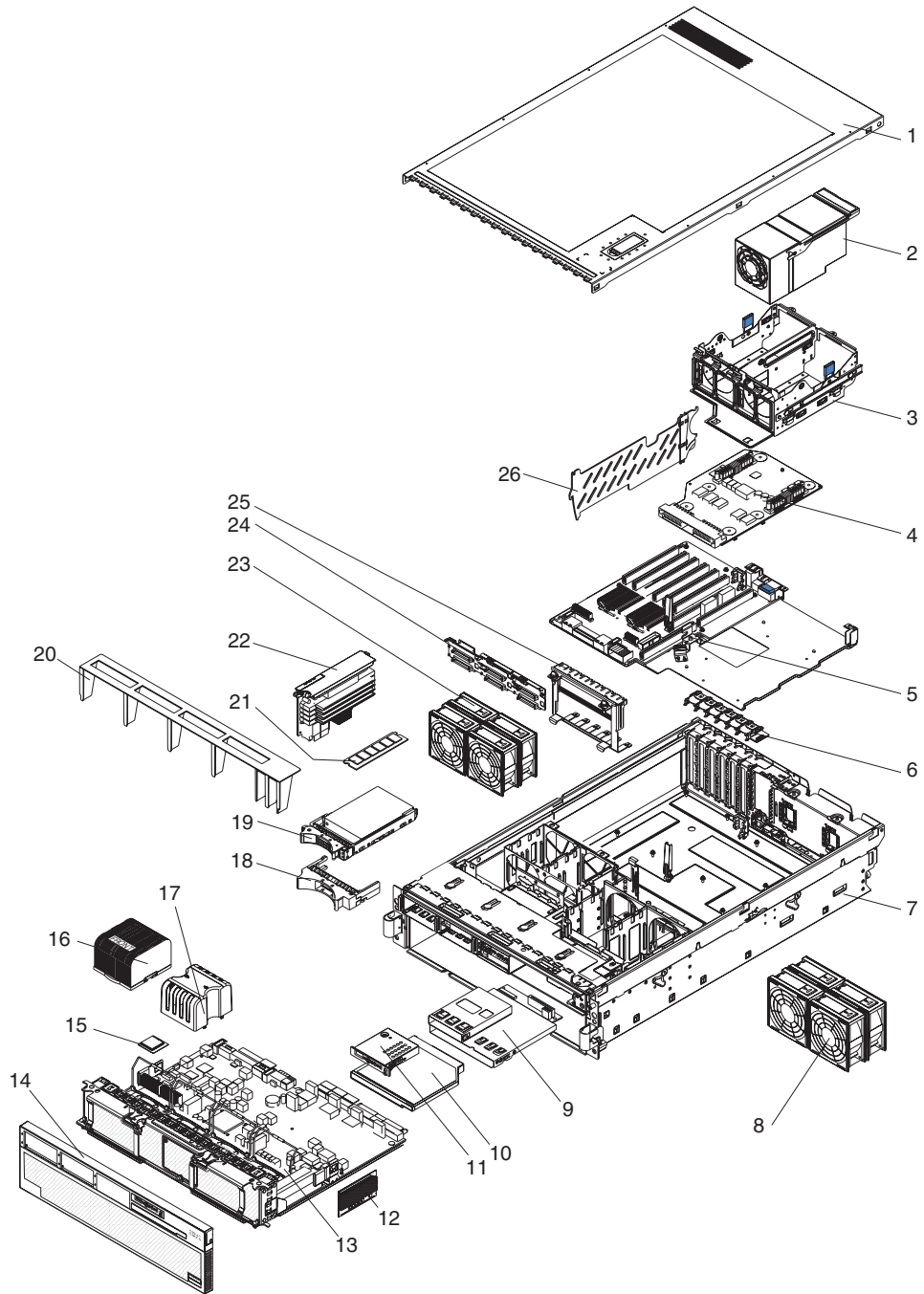
You can solve some problems by comparing the configuration and software setups between working and nonworking servers. When you compare servers to each other for diagnostic purposes, consider them identical only if all the following factors are exactly the same in all the servers:

- Machine type and model
- BIOS level
- Adapters and attachments, in the same locations
- Address jumpers, terminators, and cabling
- Software versions and levels
- Diagnostic program type and version level
- Configuration option settings
- Operating-system control-file setup



## Chapter 3. Parts listing, Type 8863

The following parts information is for the xSeries 366, Type 8863.



## Server replaceable units

**Notes:**

1. Field replaceable units (FRUs) must be serviced only by trained service technicians.
2. 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 *Warranty and Support Information* document on the *IBM xSeries Documentation CD*.

Table 3. Parts listing, Type 8863

Index	Description	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
1	Top cover	26K8947		
2	Power supply, 1300 W	24R2708		
3	Power supply structure		26K8950	
4	Power backplane			23K4111
5	PCI-X board assembly			23K4106
6	PCI-X switch card assembly			73P6869
7	Chassis assembly			26K8946
8	Fan (80 mm)	90P5051		
9	Front panel assembly, with media-interposer card		13M7881	
10	CD-ROM drive, 8/24X (optional)	26K5413		
11	Operator information panel assembly, with bracket and cables			01R1477
12	Microprocessor VRM		77P4485	
13	Microprocessor tray			23K4105
14	Front bezel	26K8956		
15	Microprocessor, 3.3 GHZ (model 1RX)			13M7878
15	Microprocessor, 3.6 GHZ (model 2RX)			13M7879
16	Heat sink			26K8805
17	Microprocessor baffle			26K9020
18	Hard disk drive filler	26K8680		
19	Hard disk drive, 36 GB (optional)	26K5656		
19	Hard disk drive, 73 GB (optional)	26K5657		
20	Air baffle			01R1479
21	Memory, 1 GB PC3200 ECC	73P2870		
22	Memory card	23K4107		
23	Fan (92 mm)	48P9687		
24	SAS hard disk drive backplane		13M7880	
25	PCI-X adapter guide assembly		26K8951	
26	PCI divider	03K9050		
	AC inlet connector cover	26K8941		
	Alcohol wipe			59P4739
	Battery, 3.0 volt	33F8354		



Table 3. Parts listing, Type 8863 (continued)

Index	Description	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
	Cable, active PCI		24P1067	
	Cable, CD/DVD signal		25K9626	
	Cable management arm	25R5238		
	Cable, operator information panel			25K9628
	Cable, SAS power		25K9622	
	Cable, SAS signal		25K9610	
	Cable, serial		00N6996	
	Cable, USB			25K9618
	DVD/CD bay filler	26K8938		
	EIA mounting bracket			26K8948
	I/O board		23K4109	
	Lift handle kit	24P1295		
	Retention module			26k8836
	Scalability connector filler	26K8943		
	ServeRAID-8i card (optional)		13N2233	
	ServeRAID-8i battery pack (optional)		13N2256	
	Slide kit		25R5236	
	System service label	26K8923		
	Thermal grease			59P4740

## Power cords

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, Lesotho, Macao, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda
14F0033	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dominica, Gambia, Ghana, Grenada, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Polynesia, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad and Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Italy, Libyan Arab Jamahiriya
14F0087	Israel
1838574	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Colombia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Taiwan, United States of America, Venezuela
24P6858	Korea (Democratic People's Republic of), Korea (Republic of)
34G0232	Japan
36L8880	Argentina, Paraguay, Uruguay
49P2078	India
49P2110	Brazil

<b>IBM power cord part number</b>	<b>Used in these countries and regions</b>
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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## Chapter 4. Removing and replacing server components

This chapter describes how to remove and replace certain server components. See Chapter 3, “Parts listing, Type 8863,” on page 91 to determine whether the component that is being replaced is a Tier 1 or Tier 2 customer-replaceable unit (CRU), or a field-replaceable unit (FRU).

- Installation of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation. You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- Installation of FRUs is intended only for trained service technicians who are familiar with IBM xSeries products.

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### Installation guidelines

Before you install options, read the following information:

- Read the safety information that begins on page vii and the guidelines in “Handling static-sensitive devices” on page 98. This information will help you work safely.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- If you must start the server while the cover is removed, make sure that no one is near the server and that no tools or other objects have been left inside the server.
- Do not attempt to lift an object that you think is too heavy for you. If you have to lift a heavy object, observe the following precautions:
  - Make sure that you can stand safely without slipping.
  - Distribute the weight of the object equally between your feet.
  - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
  - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.
- 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 are finished working on the server, reinstall all safety shields, guards, labels, and ground wires.

- For a list of supported options for the server, see <http://www.ibm.com/us/compact/>.

## 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.
- If the server has redundant power, each of the power-supply bays has a power supply installed in it.
- There is adequate space around the server to allow the server cooling system to work properly. Leave approximately 50 mm (2.0 in.) of open space around the front and rear of the server. Do not place objects in front of the fans. For proper cooling and airflow, replace the server cover before turning on the server. Operating the server for extended periods of time (more than 30 minutes) with the server cover removed might damage server components.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan as soon as possible.
- 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

**Attention:** Static electricity that is released to internal server components when the server is powered-on might cause the server to halt, which could result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when working inside the server with the power on.

The server supports hot-plug, hot-add, and 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 the server and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

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

- Limit your movement. Movement can cause static electricity to build up around you.
- The use of a grounding system is recommended. For example, wear an electrostatic-discharge wrist strap, if one is available. Always use an electrostatic-discharge wrist strap or other grounding system when working inside the server with the power on.
- 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 on the outside 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.

## Returning a device or component

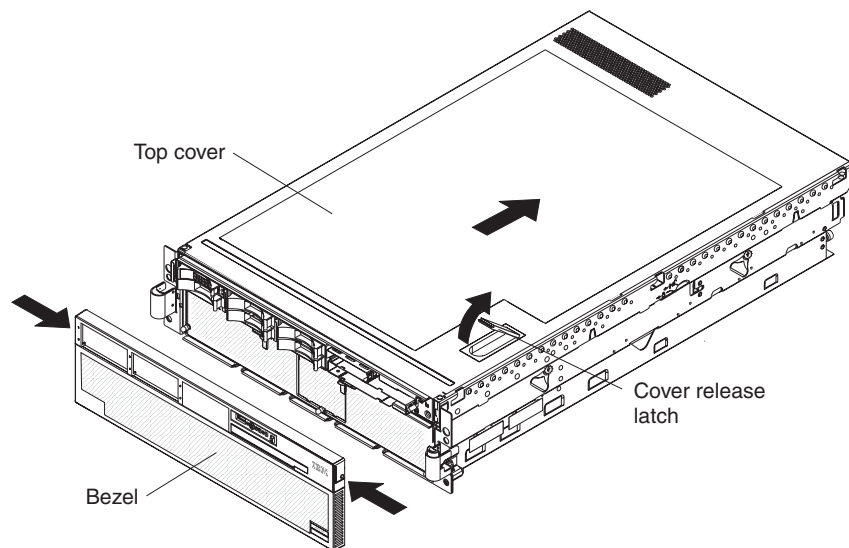
If you are instructed to return a device or component, follow the packaging instructions provided with the replacement part. Use any packaging materials for shipping that are supplied to you.

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## Removing the cover and bezel

To remove the cover and bezel, complete the following steps:

1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. If you are installing or replacing a non-hot-swap component, turn off the server and all peripheral devices, and disconnect the power cords and all external cables.
3. Slide the server out of the rack until the slide rails lock into place.



4. Lift the cover-release latch. The cover slides to the rear approximately 13 mm (0.5 inch). Lift the cover off the server.

**Attention:** For proper cooling and airflow, replace the top cover before turning on the server. Operating the server for more than 2 minutes with the top cover removed might damage server components.

5. Press on the bezel retention tabs at the top edge of the bezel, and pull the top of the bezel slightly away from the server.
6. Lift the bezel up to release the tabs at the bottom edge of the bezel.

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## Tier 1 CRU information

Installation of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

## Battery

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

- When replacing the battery, you must replace it with a lithium battery of the same type from the same manufacturer.
- To order replacement batteries, call 1-800-772-2227 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.
- After you replace the battery, you must reconfigure the system and reset the system date and time.
- To avoid possible danger, read and follow the following safety statement.

### Statement 2:



### CAUTION:

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

*Do not:*

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

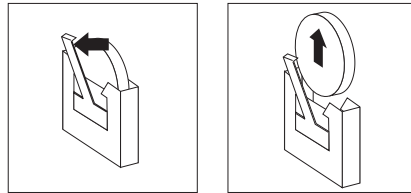
**Dispose of the battery as required by local ordinances or regulations.**

Complete the following steps to replace the battery:

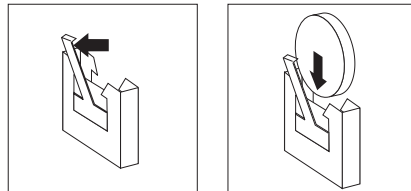
1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98, and follow any special handling and installation instructions supplied with the replacement battery.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.



3. Remove the server cover.
4. Remove the 2 SAS signal cables from the I/O board.
5. Remove the battery:
  - a. Use one finger to press the top of the battery clip away from the battery.
  - b. Lift and remove the battery from the socket.



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



7. Reconnect the 2 SAS signal cables to the I/O board.
8. Reinstall the server cover.
9. Reconnect the external cables; then, reconnect the power cords and turn on the peripheral devices and the server.

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

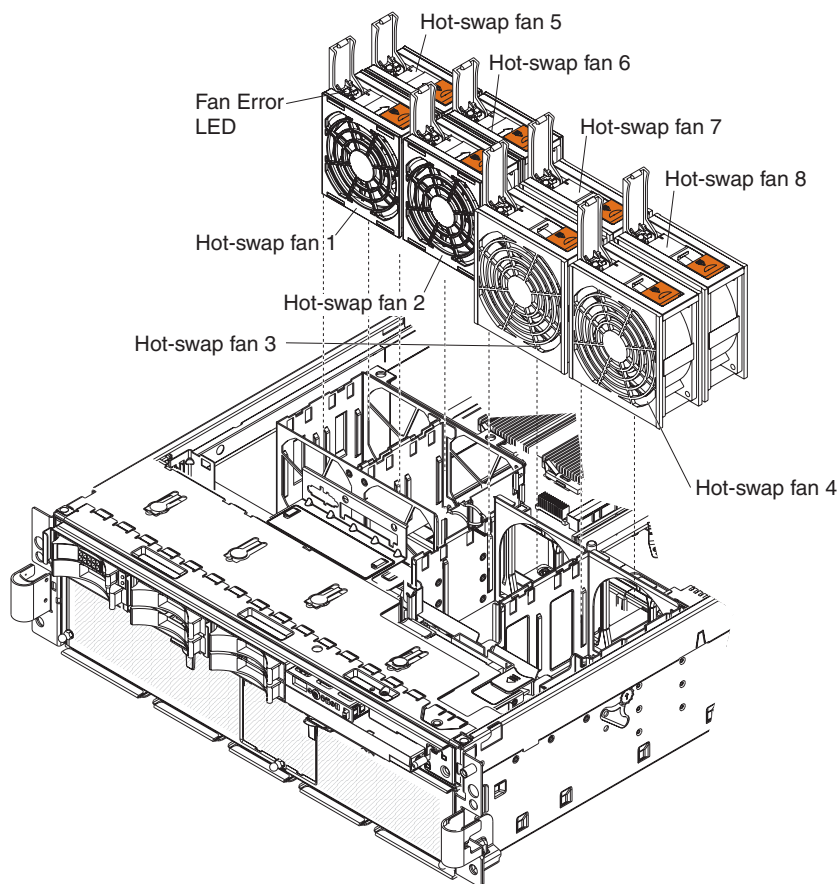
10. Start the Configuration/Setup Utility program and set configuration parameters.
  - Set the system date and time.
  - Set the power-on password.
  - Reconfigure the server.

See “Using the Configuration/Setup Utility program” on page 132 for details.

## Hot-swap fan

The server comes with 80-mm hot-swap fans in front of the PCI-X slots and 92-mm hot-swap fans in front of the memory cards. The same removal and installation procedures apply to either size fan. When a fan fails or is removed, the other fans in the server speed up to maintain a safe operating temperature in the server until the fan is reinstalled or replaced. When the fan is installed properly the fans will slow down.

To remove a hot-swap fan, complete the following steps.



1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.  
**Attention:** Static electricity that is released to internal server components when the server is powered-on might cause the server to halt, which could result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when working inside the server with the power on.
2. Remove the top cover (see “Removing the cover and bezel” on page 99).  
**Attention:** To ensure proper system cooling, do not leave the top cover off the server for more than 2 minutes.
3. Open the fan-locking handle by sliding the orange release latch in the direction of the arrow.
4. Pull upward on the free end of the handle to lift the fan out of the server.

To install a hot-swap fan, complete the following steps:

1. Open the fan-locking handle on the replacement fan.
2. Lower the fan into the socket, and close the handle to the locked position.
3. Replace the top cover.

## Hot-swap power supply

If you install or remove a hot-swap power supply, observe the following precautions:

### Statement 8:



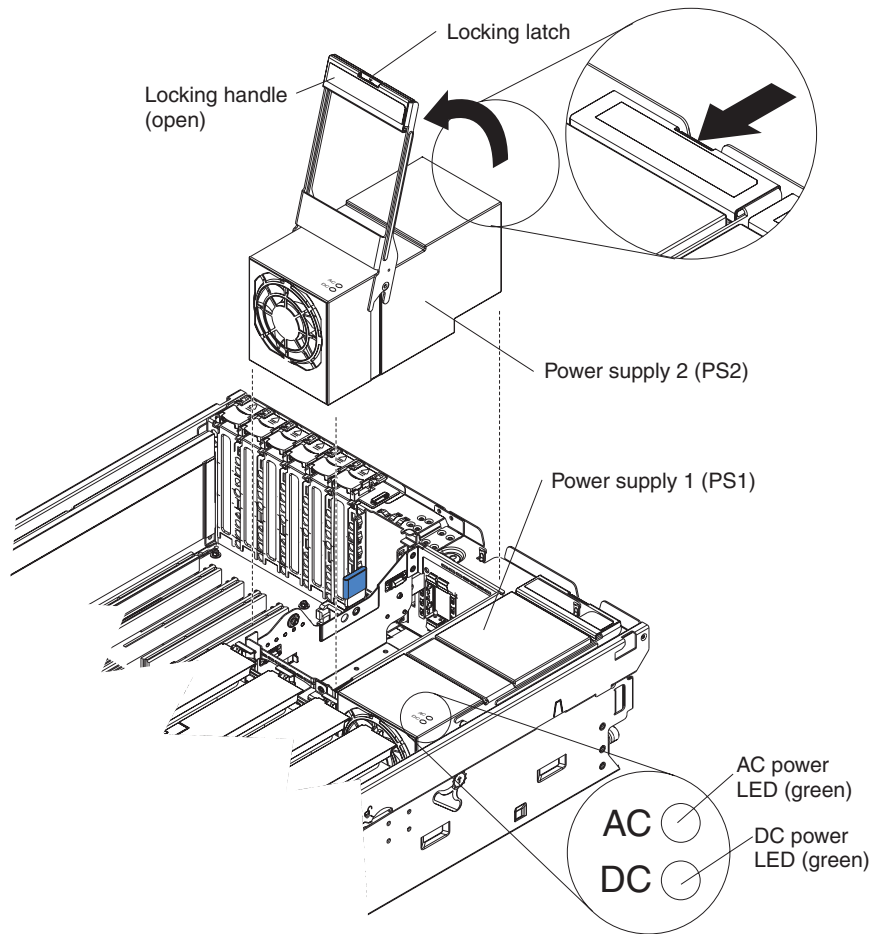
**CAUTION:**

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.

To remove a hot-swap power supply, complete the following steps.



1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.  
**Attention:** Static electricity that is released to internal server components when the server is powered-on might cause the server to halt, which could result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when working inside the server with the power on.
2. Remove the top cover (see “Removing the cover and bezel” on page 99).  
**Attention:** To ensure proper system cooling, do not leave the top cover off the server for more than 2 minutes.
3. Disconnect the power cord from the connector on the back of the power supply.
4. Press the locking latch on the power-supply handle and raise the power-supply handle to the open position.
5. Lift the power supply out of the bay.

To install a hot-swap power supply, complete the following steps:

1. Raise the handle on the power supply to the open position.
2. Place the power supply into the bay and fully close the locking handle.
3. Connect one end of the power cord for the new power supply into the connector on the back of the power supply, and connect the other end of the power cord into a properly grounded electrical outlet.

4. Make sure that the ac power LED on the top of the power supply is lit, indicating that the power supply is operating correctly. If the server is turned on, make sure that the dc power LED on the top of the power supply is lit also.
5. Replace the top cover.

## Memory module

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 333 MHz, 1.8V, 240 pin, PC2-3200 single-ranked 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 PC2-3200 SDRAM Registered DIMM specifications. For a list of the supported options for the server, see <http://www.ibm.com/us/compact/>.
- The server supports up to four memory cards. Each memory card holds up to four DIMMs.
- There must be at least one memory card with one pair of DIMMs installed for the server to operate.
- When you install additional DIMMs on a memory card, be sure to install them in pairs. All the DIMM pairs on each memory card must be the same size, and type.
- You do not have to save new configuration information to the BIOS when installing or removing DIMMs. The only exception is if you replace a DIMM that was marked as **Disabled** in the **Memory Settings** menu. In this case, you must re-enable the row in the Configuration/Setup Utility program or reload the default memory settings.
- When you restart the server after adding or removing a DIMM, the server displays a message that the memory configuration has changed.
- Install the DIMMs on each memory card in the order shown in the following tables, depending on which memory configuration you want to use. You must install at least one pair of DIMMs on each memory card.

*Table 4. Memory card installation sequence for performance configuration*

Memory card order	Memory card	DIMM pair
First	1	1 and 3
Second	2	1 and 3
Third	3	1 and 3
Fourth	4	1 and 3
Fifth	1	2 and 4
Sixth	2	2 and 4
Seventh	3	2 and 4
Eighth	4	2 and 4

*Table 5. Memory card installation sequence for cost-sensitive configuration*

Memory card order	Memory card	DIMM pair
First	1	1 and 3
		2 and 4

Table 5. Memory card installation sequence for cost-sensitive configuration (continued)

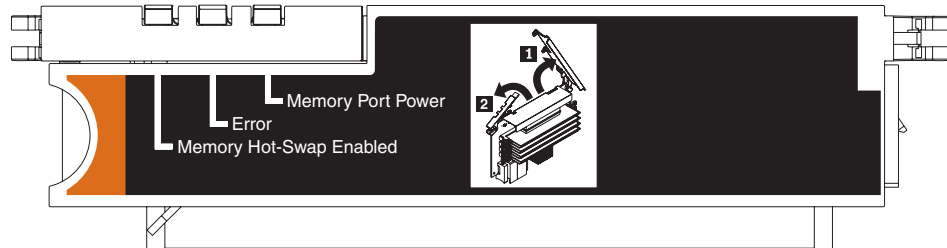
Memory card order	Memory card	DIMM pair
Second	3	1 and 3
		2 and 4
Third	2	1 and 3
		2 and 4
Fourth	4	1 and 3
		2 and 4

Table 6. Memory card installation sequence for memory-mirrored configuration

Memory card order	Memory card	DIMM pair
First	1	1 and 3
	3	1 and 3
Second	2	1 and 3
	4	1 and 3
Third	1	2 and 4
	3	2 and 4
Fourth	2	2 and 4
	4	2 and 4

- There are two memory power buses split between the four memory cards. Memory cards 1 and 2 are on power bus 1, and memory cards 3 and 4 are on power bus 2. If memory mirroring is enabled, you can hot-replace one memory card at a time on each memory power bus.
- If a problem with a DIMM is detected, light path diagnostics will light the system-error LED on the front of the server, indicating that there is a problem and guide you to the defective DIMM. When this occurs, first identify the defective DIMM; then, remove and replace the DIMM.

The following illustration shows the LEDs on the memory card:



**Memory Hot-Swap Enabled LED:** When this LED is lit, it indicates that hot-swap memory is enabled.

**Error LED:** When this LED is lit, it indicates that a memory card or DIMM has failed.

**Memory Port Power LED:** When this LED is off, it indicates that power is removed from the port and that you can remove the memory card and replace a failed DIMM. This LED will also turn off when the release levers are opened.

**Note:** Add odd numbered DIMMs to each available memory card first, then add the even numbered pairs.

## Active Memory

Active Memory is an IBM technology that improves the reliability of the DIMMs through memory mirroring, memory scrubbing, and Memory ProteXion™ features.

The following notes describe the Active Memory features:

- Memory mirroring enables you to improve the reliability of the memory in your server by creating a mirror of the data in memory port 1 and storing it in memory port 2.

**Note:** For memory mirroring to work, you must have DIMMs of the same size and clock speed in both memory ports.

Complete the following steps to enable memory mirroring:

1. Check your operating system documentation to make sure that it supports memory mirroring.
2. Install DIMMs of the same size and clock speed in the two memory ports.
3. Enable memory mirroring in the Configuration/Setup Utility program:
  - a. Turn on the server and watch the monitor screen.
  - b. When the message Press F1 for Configuration/Setup appears, press F1.
  - c. From the Configuration/Setup Utility main menu, select **Advanced Setup**.
  - d. Select **Memory Settings**.
  - e. Select **Memory Mirroring Settings**.
  - f. **Enable** the memory mirroring setting from within this window.
  - g. Save and exit the Configuration/Setup Utility program.

When memory mirroring is enabled, the data that is written to memory is stored in two locations. One copy is kept in the memory port 1 DIMMs, while a second copy is kept in the memory port 2 DIMMs. During the execution of the read command, the data is read from the DIMM with the least number of reported memory errors through Memory scrubbing, which is enabled with memory mirroring.

If memory scrubbing determines that a DIMM is damaged beyond use, read and write operations are redirected to the remaining good DIMMs. Memory scrubbing then reports the damaged DIMM and the Light Path Diagnostics feature displays the error. After the damaged DIMM is replaced, memory mirroring then copies the mirrored data back into the new DIMM.

- Memory scrubbing is an automatic daily test of all the system memory that detects and reports memory errors that might be developing before they cause a server outage.

**Note:** Memory scrubbing and Memory ProteXion technology work with each other and do not require memory mirroring to be enabled to work.

When an error is detected, memory scrubbing determines whether the error is recoverable. If it is recoverable, Memory ProteXion is enabled and the data that was stored in the damaged locations is rewritten to a new location. The error is then reported so that preventive maintenance can be performed. Provided that there are enough good locations to enable the correct operation of the server, no further action is taken other than recording the error in the error logs.

If the error is not recoverable, memory scrubbing sends an error message to the Light Path Diagnostics feature, which then lights the applicable LEDs to guide you to the damaged DIMM. If memory mirroring is enabled, the mirrored copy of the data in the mirrored DIMM is used to refresh the new DIMM after it is installed.

- Memory ProteXion reassigns memory bits to new locations within memory when recoverable errors have been detected.

When a recoverable error is found by memory scrubbing, the Memory ProteXion feature writes the data that was to be stored in the damaged memory locations to spare memory locations within the same DIMM.

## Removing and replacing a memory card

At least one memory card with one pair of DIMMs must be installed for the server to operate correctly.

**Replacing a memory card:** Complete the following steps to replace a memory card:

1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.
3. Remove the cover from the server (see “Removing the cover and bezel” on page 99).
4. Prepare the new memory card to go into the server:
  - a. Touch the static protective package containing the memory card to any unpainted surface on the outside of the server. Then, remove the memory card from the package.
  - b. Place the memory card on a flat, static protected surface with the DIMM connectors facing up.
  - c. Install memory DIMMs in the memory card (see “Installing memory modules” on page 109).
5. Remove the memory card from the server:
  - a. Make sure that the retention levers on the edge of the memory card are fully open.
  - b. Lift the memory card out of the server and set it aside.
6. Replace the memory card:
  - a. Grasp the new memory card by the retention levers and turn the memory card so that the connector aligns with the connector on the microprocessor board.
  - b. Insert the memory card into the memory card connector.
  - c. Press the memory card into the connector and close the retention levers.
7. Reconnect external cables and power cords.

**Hot-replacing a memory card:** To hot-replace a memory card memory mirroring must be enabled. See “Active Memory” on page 107 for information on how to enable memory mirroring.

Complete the following steps to hot-replace a memory card in the server:

**Attention:** Static electricity that is released to internal server components when the server is powered-on might cause the server to halt, which could result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when working inside the server with the power on.

1. Read the safety information beginning on page v and “Installation guidelines” on page 97.



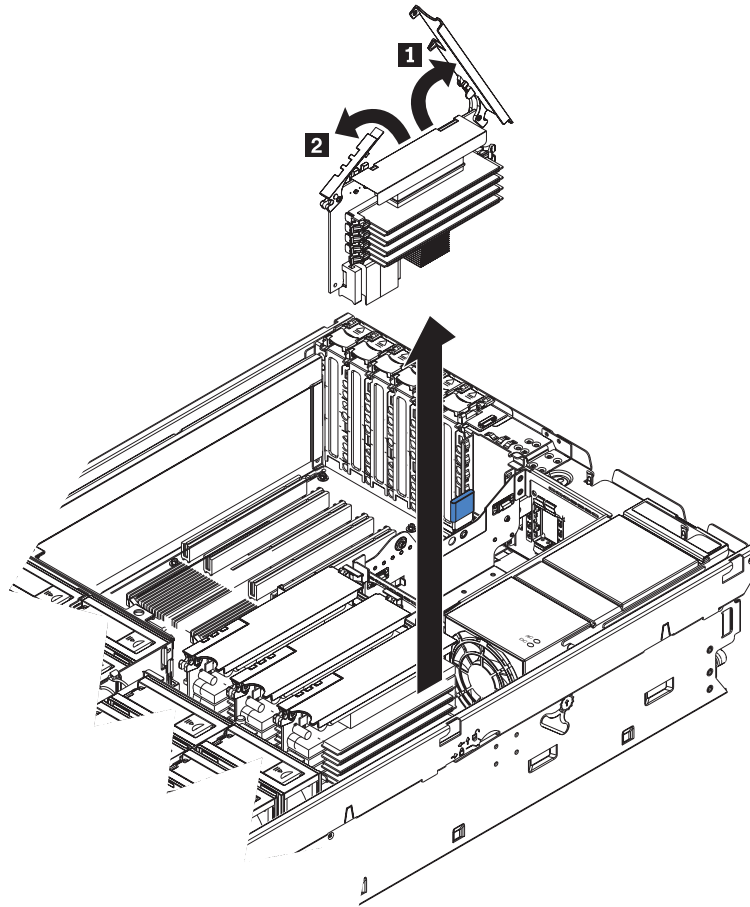
2. Remove the cover from the server (see “Removing the cover and bezel” on page 99).
3. Make sure the Memory Hot-Swap Enabled LED is lit on the top of the memory card to be replaced. If the LED is not lit, enable memory mirroring (see “Active Memory” on page 107).
4. Prepare the new memory card to go into the server:
  - a. Touch the static protective package containing the memory card to any unpainted surface on the outside of the server. Then, remove the memory card from the package.
  - b. Place the memory card on a flat, static protected surface with the DIMM connectors facing up.
  - c. Install memory DIMMs in the memory card (see “Installing memory modules”).
5. Remove the memory card from the server:
  - a. Make sure that the retention levers on the edge of the memory card are fully open.
  - b. Lift the memory card out of the server.
6. Replace the memory card:
  - a. Grasp the new memory card by the retention levers and turn the memory card so that the connector aligns with the connector on the microprocessor board.
  - b. Insert the memory card into the memory card connector.
  - c. Press the memory card into the connector and close the retention levers.

### **Installing memory modules**

Memory modules are installed on a memory card. DIMMs must be installed in pairs of the same type and speed. To use the memory mirroring feature, all the DIMMs that are installed in the server must be the same type and speed, and the feature must be supported by your operating system. The following instructions are for installing one pair of memory modules. To install memory-module pairs on more than one memory card, repeat steps 3 through 7 for each memory card.

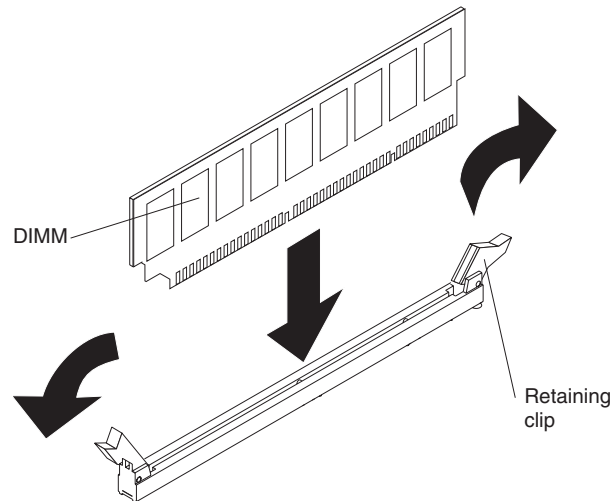
***Installing a memory module:*** To install a memory module, complete the following steps:

1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.



3. Remove the memory card.
  - a. Open the memory card retention levers ( **1** and **2** ) on the top of the memory card.
  - b. While holding the retention levers open, lift the memory card out of the server.
4. Place a memory card on a flat, static protected surface with the DIMM connectors facing up.

**Attention:** To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.
5. Open the retaining clip on each end of the DIMM connector.
6. Touch the static-protective package that contains the DIMM to any unpainted metal surface on the outside of the server. Then, remove the DIMM from the package.
7. Turn the DIMM so that the DIMM keys align correctly with the slot.



8. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector.
9. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly inserted; open the retaining clips, remove the DIMM, and then reinsert it.
10. Repeat steps 5 through 9 to install the second DIMM in the pair and for each additional pair that you install.
11. Replace the memory card:
  - a. Insert the memory card into the memory card connector.
  - b. Press the memory card into the connector and close the retention levers.
12. Reconnect external cables and power cords.

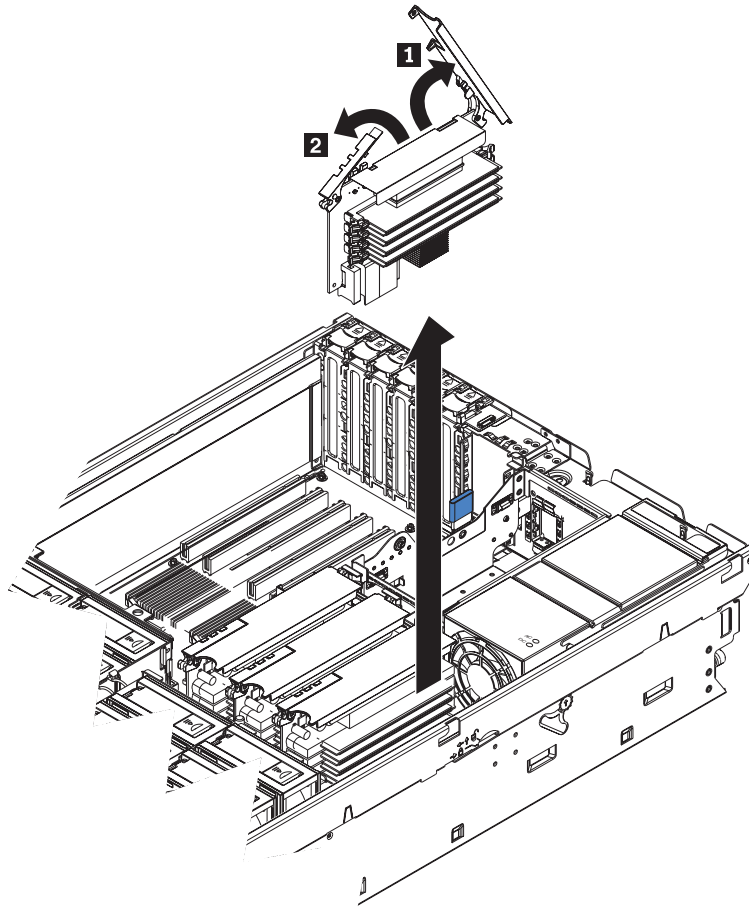
**Hot-swapping a memory module:** To hot-swap memory modules, complete the following steps:

1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
 

**Attention:** Static electricity that is released to internal server components when the server is powered-on might cause the server to halt, which could result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when working inside the server with the power on.
2. Remove the top cover “Removing the cover and bezel” on page 99.
 

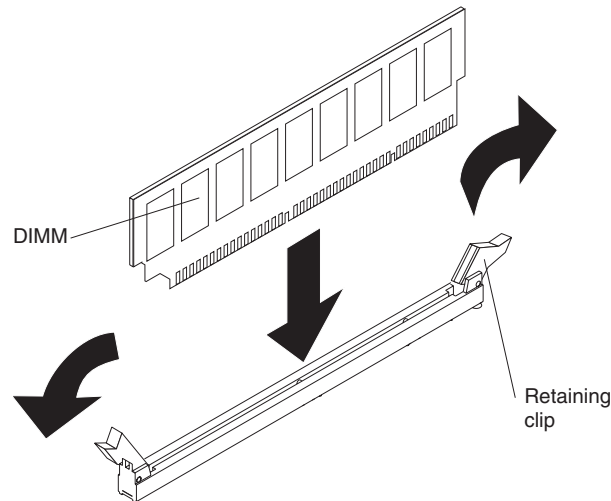
**Attention:** When moving the memory card, do not allow it to impact any components or structures inside the server.

Make sure that the Memory Hot-Swap Enabled LED is lit.



3. Remove the memory card.
  - a. Open the memory card retention levers ( **1** and **2** ) on the top of the memory card.
  - b. While holding the retention levers open, lift the memory card out of the server.
4. Place a memory card on a flat, static protected surface with the DIMM connectors facing up.

**Attention:** To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.
5. Open the retaining clip on each end of the DIMM connector and remove the DIMM or DIMMs to be replaced.
6. Touch the static-protective package that contains the DIMM to any unpainted metal surface on the outside of the server. Then, remove the DIMM from the package.
7. Turn the DIMM so that the DIMM keys align correctly with the slot.



8. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector.
9. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly inserted; open the retaining clips, remove the DIMM, and then reinsert it.
10. Repeat steps 5 through 9 to replace any remaining DIMMs on the memory card.
11. Replace the memory card:
  - a. Insert the memory card into the memory card connector.
  - b. Press the memory card into the connector and close the retention levers.

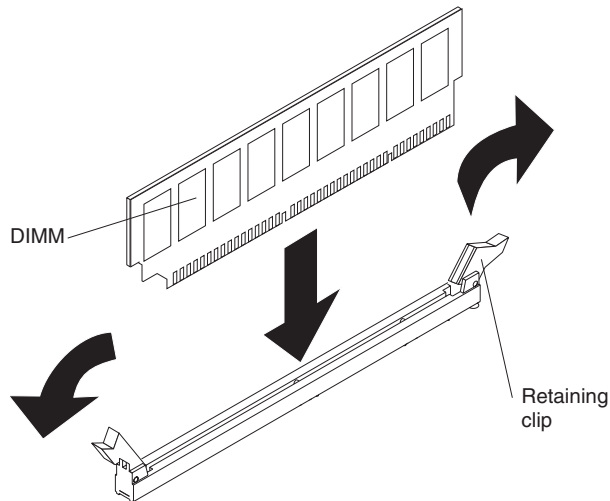
**Hot-adding memory modules:** To hot-add memory modules and memory cards, complete the following steps:

1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
 

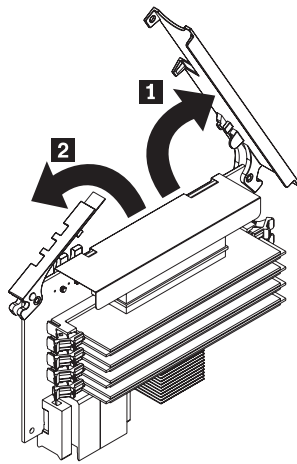
**Attention:** Static electricity that is released to internal server components when the server is powered-on might cause the server to halt, which could result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when working inside the server with the power on.
2. Remove the top cover “Removing the cover and bezel” on page 99.
 

**Attention:** When moving the memory card, do not allow it to impact any components or structures inside the server.
3. Place a memory card on a flat, static protected surface with the DIMM connectors facing up.
 

**Attention:** To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.
4. Open the retaining clip on each end of the DIMM connector.
5. Touch the static-protective package that contains the DIMM to any unpainted metal surface on the outside of the server. Then, remove the DIMM from the package.
6. Turn the DIMM so that the DIMM keys align correctly with the slot.



7. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector.
8. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly inserted; open the retaining clips, remove the DIMM, and then reinsert it.
9. Repeat steps 4 through 8 to install any remaining DIMMs on the memory card.
10. Open the memory card retention levers ( **1** and **2** ) on the top of the memory card.
11. Insert the memory card into the memory card connector.
12. Press the memory card into the connector and close the retention levers.



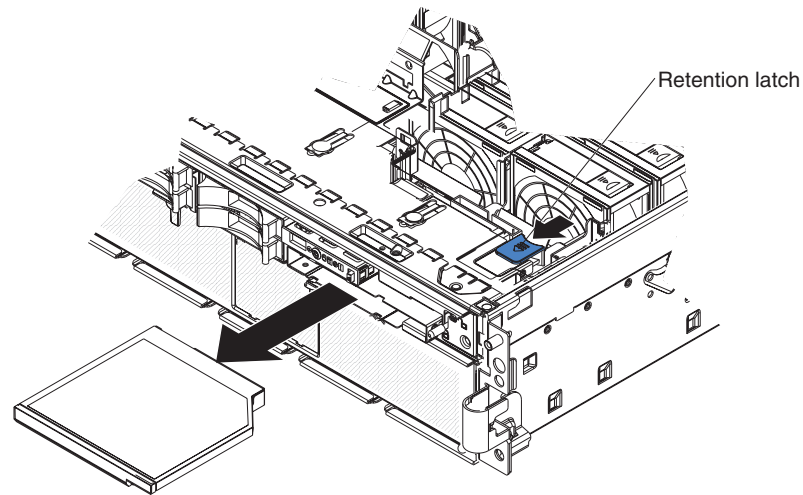
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## Tier 2 CRU information

You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.

### DVD Drive

To remove the DVD drive, complete the following steps.



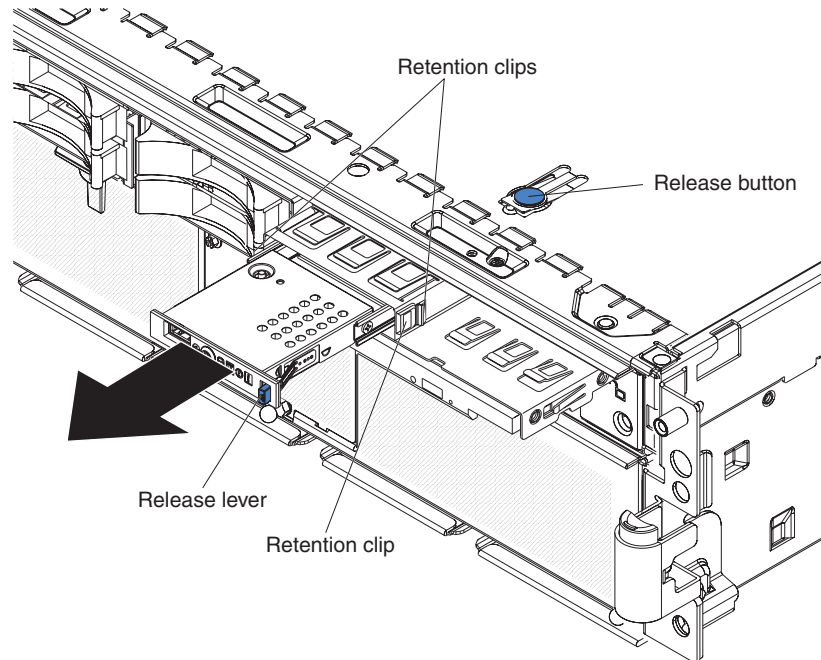
1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.
3. Remove the top cover and bezel (see “Removing the cover and bezel” on page 99).
4. Pull the blue retention latch forward and pull the DVD drive out of the server.

To install a DVD drive, complete the following steps:

1. Slide the DVD drive into the server to engage the drive.
2. Replace the top cover and bezel.
3. Reconnect the external cables and power cords.

## Operator information panel assembly

To remove the operator information panel assembly, complete the following steps.



1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.
3. Remove the top cover and bezel (see “Removing the cover and bezel” on page 99).
4. Note where the light path diagnostics ribbon cable and front USB cable are connected, and then disconnect both cables from the I/O board.
5. Press the blue release button above the front-panel assembly and pull the assembly out of the server approximately one inch (25 mm).
6. Press the blue release lever on the operator information panel assembly to the left and gently pull the information panel assembly out of the front-panel assembly until it stops.
7. Press the retention clips on each side of the information panel assembly and continue pulling the information panel assembly out of the front-panel assembly until it stops.
8. Press the retention clip on the right side of the information panel assembly and pull the information panel assembly out of the front-panel assembly.

To install an operator information panel assembly, complete the following steps:

1. Guide the light path diagnostics ribbon cable and front USB cable through the front-panel assembly first, and insert the information panel assembly into the front-panel assembly until the blue release lever on the front engages.
2. Connect the light path diagnostics ribbon cable and front USB cable to the I/O board.
3. Slide the front-panel assembly into the server until the blue tab on the chassis engages.
4. Replace the bezel and top cover.



5. Reconnect external cables and power cords.

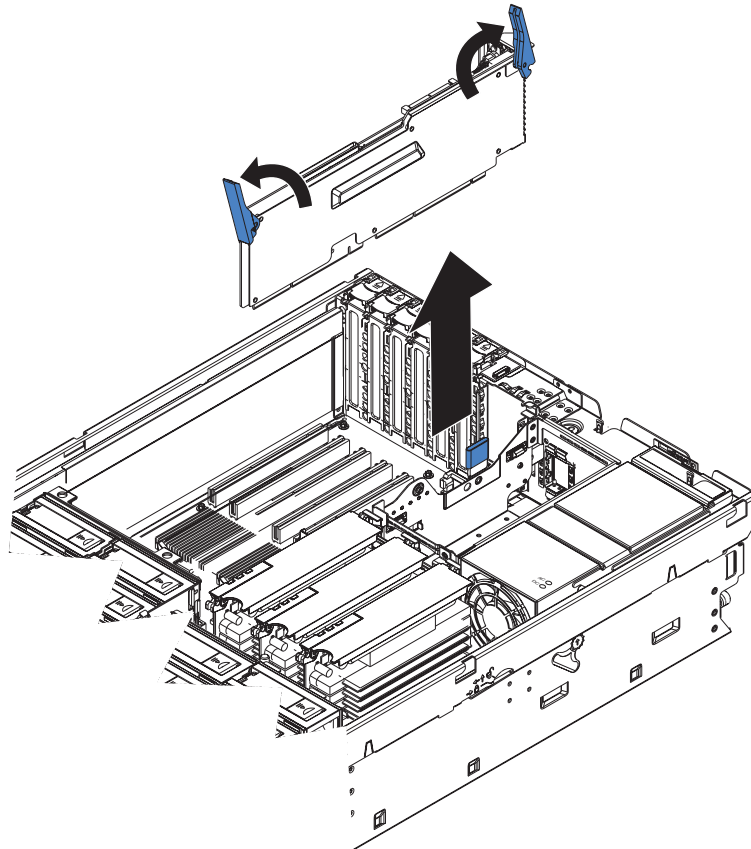
## I/O board

When replacing the I/O board, you must either update the server with the latest SAS firmware or restore the pre-existing firmware from a diskette or CD image.

The I/O board contains three-pin jumper blocks. See “I/O board internal connectors and jumpers” on page 7 for the location and description of each jumper block.

### Replacing the I/O board

To remove the I/O board, complete the following steps.



1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.
3. Remove the top cover.  
**Attention:** When moving the I/O board, do not allow it to impact any components or structures inside the server.
4. Open the release latches on both ends of the I/O board and pull the board from the server slightly.
5. Note where each cable is connected, and then disconnect all cables from the I/O board and remove the assembly from the server.

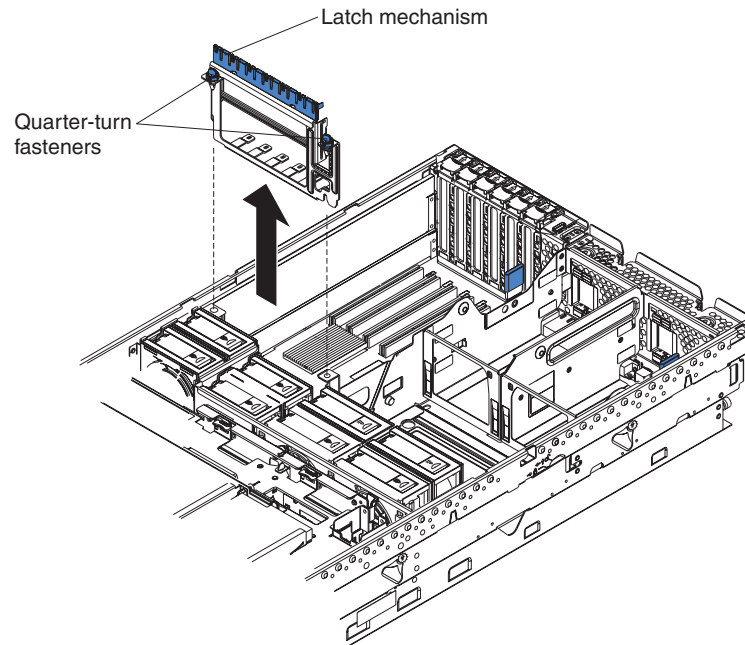
To install an I/O board, complete the following steps:

1. Connect all cables to the internal connectors on the I/O board.

2. Align the board with the card guides and insert the board in the connector.
3. Close the release latches to seat the board in the connector.
4. Replace the top cover.
5. Reconnect the external cables and power cords.

## PCI-X adapter guide

To remove the PCI-X adapter guide, complete the following steps.



1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.
3. Remove the top cover.
4. Lift the latch mechanism.
5. Remove all adapters and adapter dividers, and place the adapters on a static-protective surface (see the *User’s Guide* on the IBM xSeries Documentation CD).

**Note:** You might find it helpful to note where each adapter is installed before removing the adapters.

6. Disconnect one end of all cables that pass through the PCI-X adapter guide; then, remove the cables from the routing feature of the guide and fold the cables out of the way.

**Note:** You might find it helpful to note where each cable is connected before disconnecting the cables.

7. Turn the blue quarter-turn fasteners to release the PCI-X adapter guide.
8. Lift the guide out of the server.

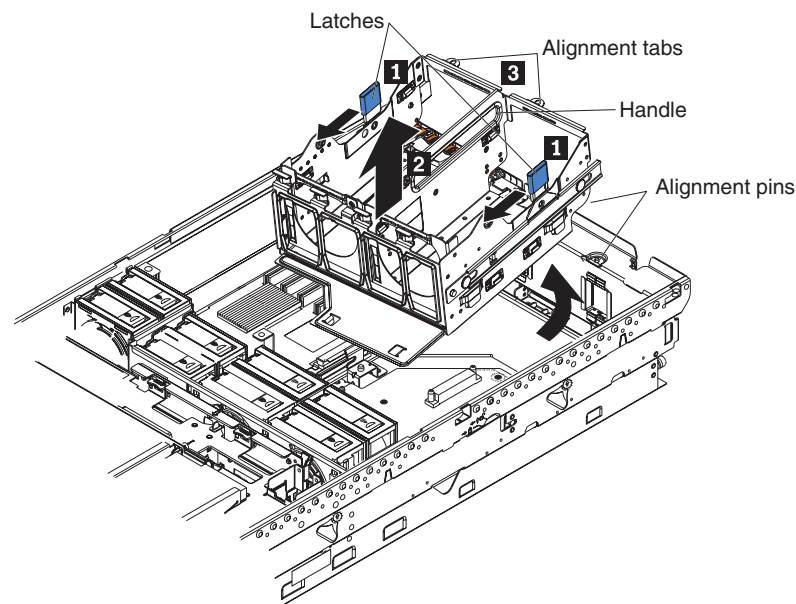
To install a PCI-X adapter guide, complete the following steps:

1. Align the two tabs on the PCI-X adapter guide with the two slots on the chassis.

2. Set the guide firmly into place and turn the quarter-turn fasteners to secure the guide.
3. Reconnect the cables that pass through the PCI-X adapter guide and route the cables through the routing feature of the guide.
4. Install the adapters and dividers.
5. When replacing the dividers, make sure that the tabs on the bottom of the dividers rest in the holes in the bottom of the metal section of the guide and the tabs on the top of the dividers engage the plastic retainer section of the guide.
6. Lower the latch mechanism.
7. Replace the top cover.
8. Reconnect external cables and power cords.

## Power-supply structure

To remove the power-supply structure, complete the following steps.



1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
 

**Attention:** Static electricity that is released to internal server components when the server is powered-on might cause the server to halt, which could result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when working inside the server with the power on.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.
3. Remove the top cover.
4. Remove the memory cards (see “Removing and replacing a memory card” on page 108).
5. Remove the power supplies (see “Hot-swap power supply” on page 102).
6. Pull the two blue latches ( **1** ) on the power-supply structure toward the front of the server; the structure will disengage from the chassis.
7. Grasp the handle in the middle of the structure and rotate the structure up ( **2** ), allowing the structure to pivot at the chassis front.

8. Lift the structure out of the server, and make sure that the alignment tabs clear the chassis.

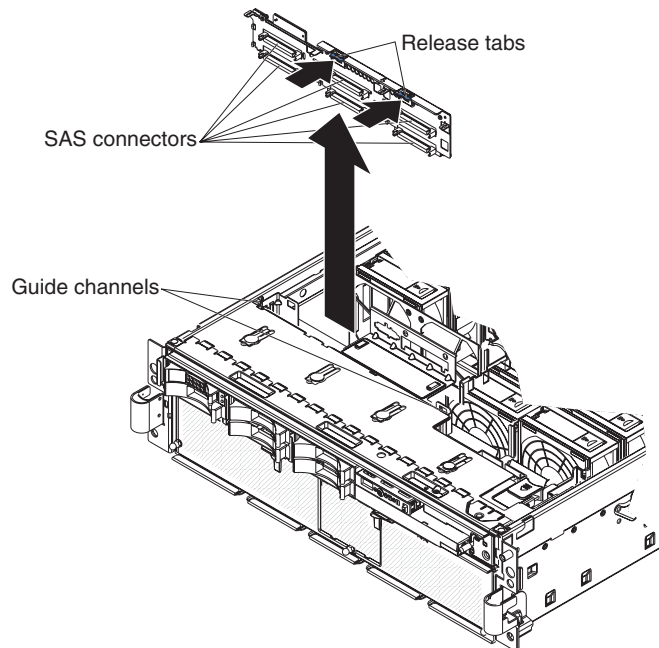
To install a power-supply structure, complete the following steps.

**Attention:** Do not allow any cables to be pinched or caught on metal protrusions.

1. Align the tabs on the power-supply structure with the notches on the rear of the chassis; then, gently lower the structure into the server. Make sure that the structure is firmly seated in the chassis.
2. Push the two blue latches of the power-supply structure toward the rear of the server until they lock the structure into position.
3. Replace the power supplies.
4. Replace the memory cards.
5. Replace the top cover.
6. Reconnect the external cables and power cords.

## SAS backplane

To remove the Serial Attached SCSI (SAS) backplane, complete the following steps.



1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.
3. Remove the top cover.
4. Pull the hard disk drives out of the server slightly to disengage them from the SAS backplane.
5. Note where the SAS cables are connected, and then disconnect the 2 SAS cables from the SAS backplane.
6. Squeeze the two blue release tabs.
7. Lift the SAS backplane out of the server slightly; then, disconnect the power cable and remove the backplane.

To install a SAS backplane, complete the following steps:

1. Connect the power cable to the replacement backplane.
2. Slide the backplane into the card guides.
3. Align the two slots in the backplane with the two guide tabs; then, press firmly until the blue tabs secure the backplane.
4. Reconnect the SAS cables to the backplane.
5. Replace the top cover.
6. Replace the hard disk drives.
7. Reconnect the external cables and power cords.

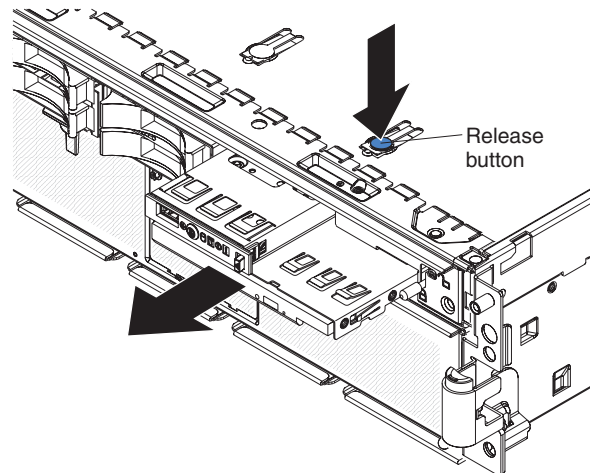
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## FRU information

**Important:** The field-replaceable unit (FRU) procedures are intended for trained service technicians who are familiar with IBM xSeries products.

### Front-panel assembly

To remove the front-panel assembly, complete the following steps.



1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.
3. Remove the top cover and bezel.
4. Remove the DVD drive power and signal cables from the media-interposer card.
5. Note where the light path diagnostics ribbon cable is connected, and then disconnect the light path diagnostics ribbon cable from the I/O board.
6. Press the blue tab on the chassis above the front-panel assembly and pull the assembly out of the server.

To install a front-panel assembly, complete the following steps:

1. Guide the light path diagnostics ribbon cable through first, and insert the assembly into the server through the front.
2. Connect the DVD drive power cable and signal cable.
3. Connect the light path diagnostics ribbon cable to the I/O board.
4. Replace the bezel and top cover.

5. Reconnect the external cables and power cords.

## Microprocessor tray and microprocessor

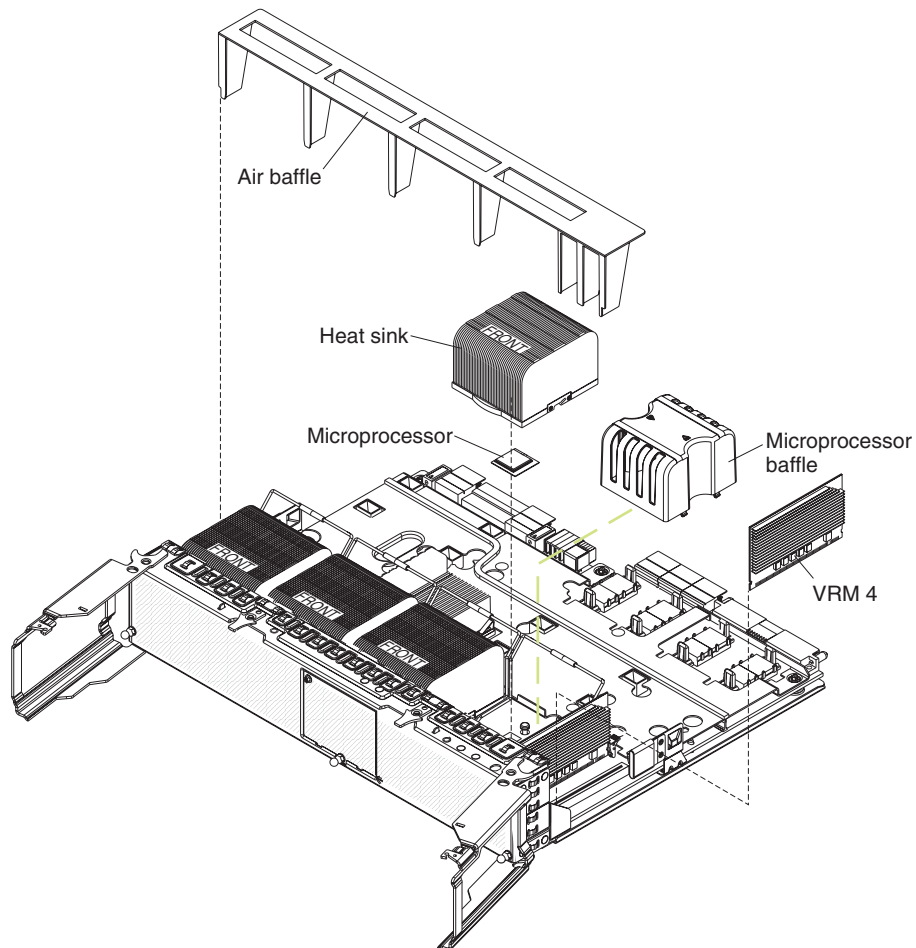
The following sections describe how to replace the microprocessor tray and a microprocessor.

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

- The voltage regulators for microprocessors 1 and 2 are integrated on the microprocessor board; the VRMs for microprocessors 3 and 4 come with the microprocessor options and must be installed on the microprocessor board.
- When installing additional microprocessors, populate the microprocessor connectors in numeric order, starting with connector 2. If you install the microprocessors in the wrong order, the server will not turn on.
- You can use the Configurations/Setup utility program to determine the specific type of microprocessor in the server.

### Removing and installing a microprocessor

Complete the following steps to remove the microprocessor tray and a microprocessor.



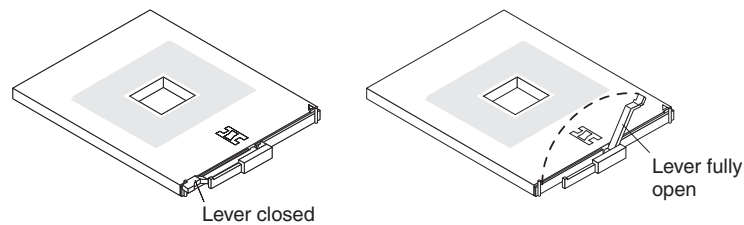
1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.

3. Remove the top cover and bezel (see “Removing the cover and bezel” on page 99).
4. Remove all fans (see “Hot-swap fan” on page 101).
5. Remove the memory cards (see “Removing and replacing a memory card” on page 108).
6. Lift the microprocessor-tray release latch.
7. Open the microprocessor-tray levers.
 

**Attention:** The microprocessor tray is heavy. Pull the tray partially out of the server, and then reposition your hands to grasp the body of the tray, before pulling out the tray the rest of the way.
8. Remove the microprocessor tray.
9. Press in on the release latches on each side of the tray; then, pull the tray out the rest of the way.
10. Lift the air baffle out of the microprocessor tray.
11. Open the heat sink-release lever and remove the heat sink.
12. Open the microprocessor-release lever and remove the microprocessor from the microprocessor socket.

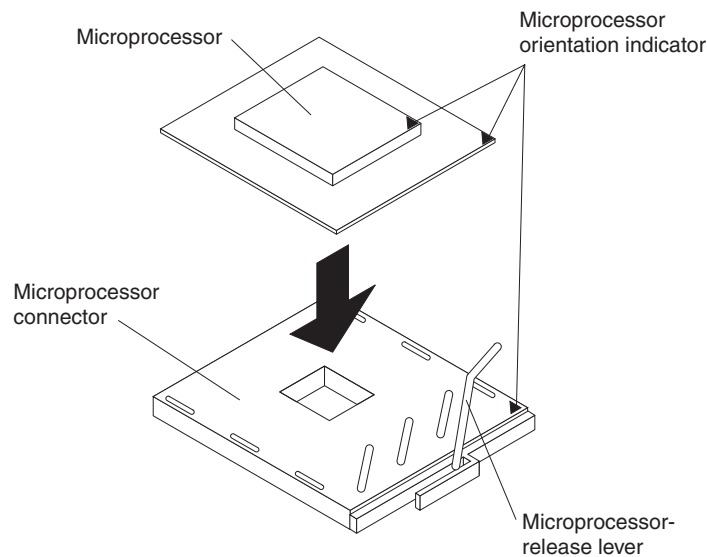
To install a microprocessor tray and a microprocessor, complete the following steps:

1. Lift the microprocessor-release lever to the fully open position (approximately 135° angle).



**Attention:** To avoid bending the pins on the microprocessor, do not use excessive force when pressing it into the socket.

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



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



4. Make sure that the heat-sink retaining clip is open.
5. If you are installing a new heat sink, remove the cover from the bottom of the heat sink. If you are reinstalling a heat sink that was previously removed, go to “Thermal grease” for instructions on replacing the contaminated or missing thermal grease; then, return here and continue step 6.
6. If necessary, remove the cover from the bottom of the heat sink.
7. Position the heat sink above the microprocessor; then, press the heat sink into place and close the heat-sink release lever.

**Note:** If you are installing an additional microprocessor in microprocessor socket 3 or 4, you must also install a VRM.

8. If necessary, install a VRM in the connector.
  - a. Open the retaining clips on each end of the VRM connector.
  - b. Turn the VRM so the keys align with the slot.
  - c. Insert the VRM into the connector by aligning the edges of the VRM with the slots at the end of the VRM connector. Firmly press the VRM straight down into the connector by applying pressure on both ends of the VRM simultaneously. The retaining clips snap into the locked position when the VRM is seated in the connector.
9. Install the air baffle in the microprocessor tray.
10. Install the microprocessor tray in the server:
  - a. Make sure that the microprocessor-tray release latch is open; then, push the microprocessor tray into the server.
  - b. Close the tray levers and make sure they are securely latched.
  - c. Close the microprocessor-tray release latch.
  - d. Reinstall the fans and memory cards in the server.
11. Reinstall the top cover and bezel.
12. Reconnect external cables and power cords.

### Thermal grease

The thermal grease must be replaced whenever the heat sink has been removed from the top of the microprocessor and is going to be reused or when debris is found in the grease.

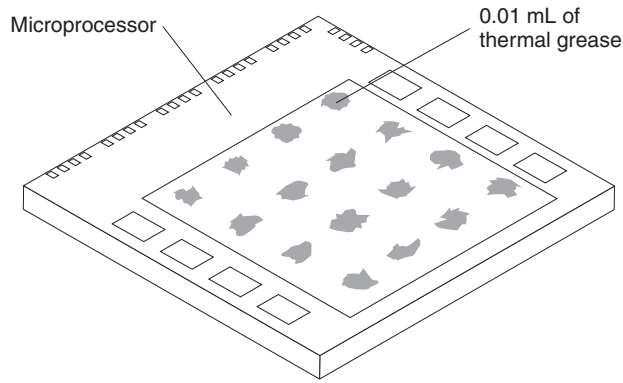
To replace damaged or contaminated thermal grease on the microprocessor and heat sink, complete the following steps:

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

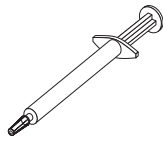
**Note:** Make sure that all of the thermal grease is removed.

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





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

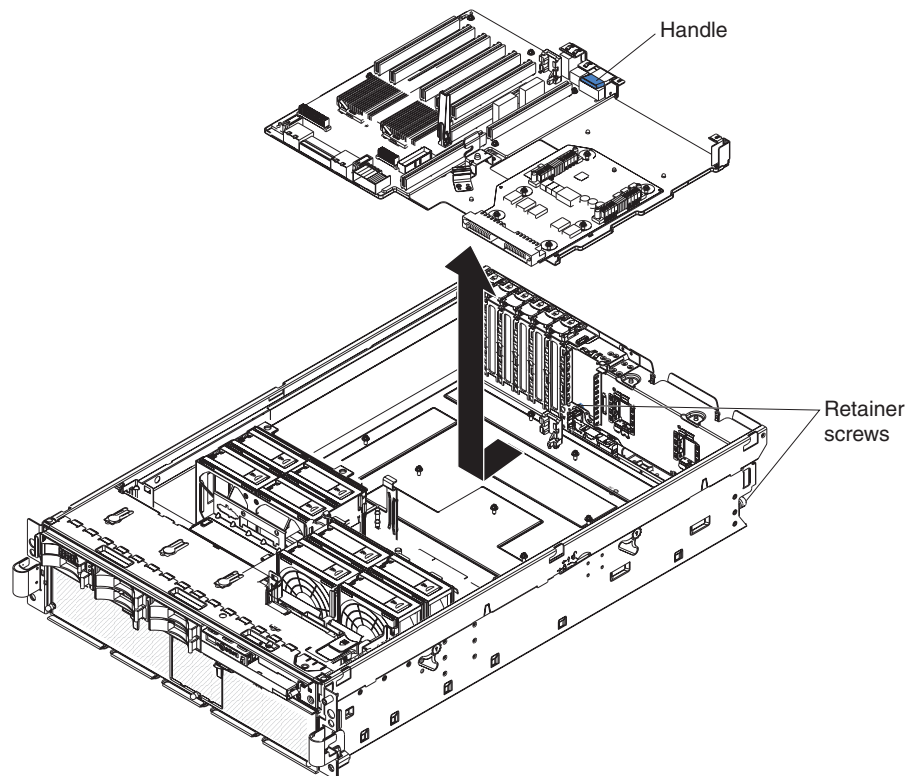


**Note:** 0.01mL is one tick mark on the syringe. If the grease is properly applied, approximately half (0.22 mL) of the grease will remain in the syringe.

6. Install the heat sink onto the microprocessor as described in “Removing and installing a microprocessor” on page 122.

## PCI-X board assembly

Complete the following steps to remove a PCI-X board assembly.



1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.
3. Remove the top cover and bezel (see “Removing the cover and bezel” on page 99).
4. Remove the power supplies and power-structure assembly (see “Power-supply structure” on page 119).
5. Remove the I/O board (see “I/O board” on page 117).
6. Remove all adapters and adapter dividers, and place the adapters on a static-protective surface.

**Note:** You might find it helpful to note where each adapter is installed before removing the adapters.

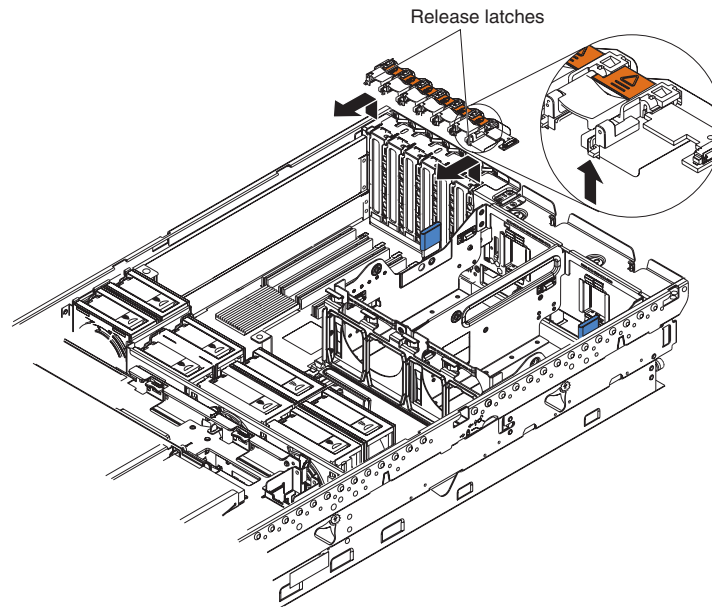
7. Disconnect the PCI-X switch card cable from the PCI-X board (see “PCI-X switch card assembly” on page 127).
8. Disconnect the SAS backplane power cable from the PCI-X board (see “SAS backplane” on page 120).
9. Remove all fans (see “Hot-swap fan” on page 101).
10. Remove the memory cards (see “Removing and replacing a memory card” on page 108).
11. Lift the microprocessor-tray release latch, open the microprocessor-tray levers, and pull the microprocessor tray out of the server slightly (see “Removing and installing a microprocessor” on page 122).
12. Remove the power backplane (see “Power backplane” on page 128).
13. Loosen the blue retainer screws on the rear of the server.
14. Slide the PCI-X board assembly toward the front of the server and grasp the blue handle to pull the assembly out of the server.

To install a PCI-X board assembly, complete the following steps:

1. Grasp the blue handle on the PCI-X board assembly and place the assembly in the chassis. Slide the assembly toward the rear of the chassis and align it with the blue retainer screws.
2. Tighten the retainer screws to secure the assembly.
3. Install the power backplane.
4. Slide the microprocessor-tray assembly back into the server.
5. Install the memory cards.
6. Install all fans.
7. Connect the SAS backplane power cable to the connector on the PCI-X board.
8. Connect the PCI-X switch card cable to the connector on the PCI-X board.
9. Install the PCI-X adapter guide and the adapter dividers.
10. Install the I/O board.
11. Install the power supplies and the power-structure assembly.
12. Replace the top cover and bezel.
13. Reconnect the external cables and power cords.

## PCI-X switch card assembly

Complete the following steps to remove a PCI-X switch-card assembly.



1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.
3. Remove the top cover and bezel (see “Removing the cover and bezel” on page 99).
4. Remove all adapters and adapter dividers, and place the adapters on a static-protective surface.

**Note:** You might find it helpful to note where each adapter is installed before removing the adapters.

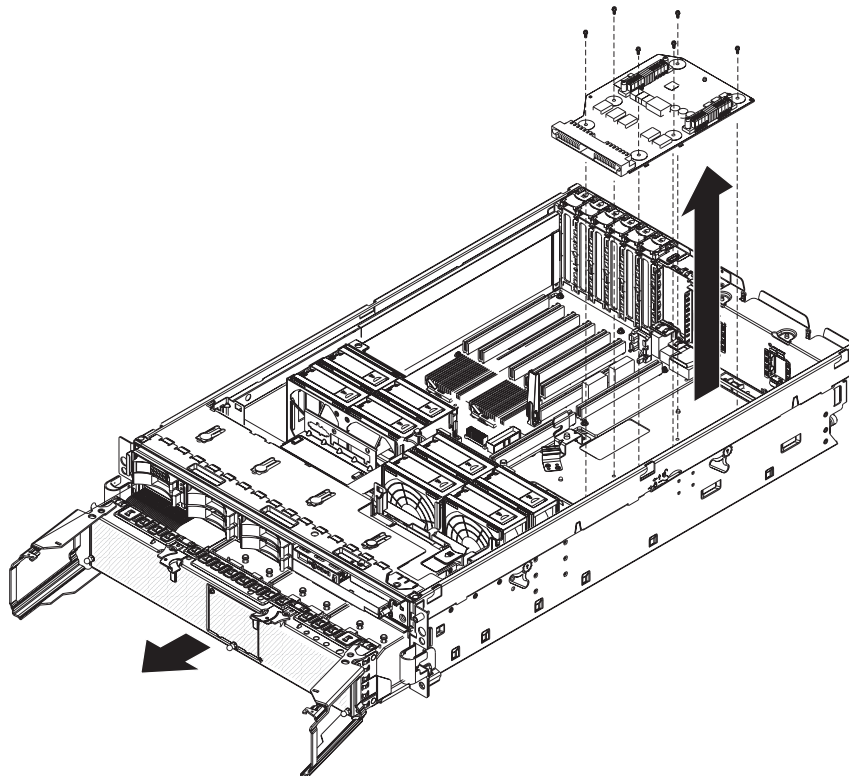
5. Disconnect the PCI-X switch card ribbon cable from the card.
6. Lift the release latches and slide the card away from the chassis; then, remove the card from the server.

To install a PCI-X switch-card assembly, complete the following steps:

1. Lower the card into place so that the lips on the bottom of the EMI shielding material fit into the chassis, and slide the card into place until the two release latches snap securely.
2. Connect the ribbon cable to the PCI-X switch-card assembly.
3. Install the adapters and adapter dividers.
4. Replace the top cover and bezel.
5. Reconnect the external cables and power cords.

## Power backplane

Complete the following steps to remove a power backplane.



1. Read the safety information that begins on page vii, and “Handling static-sensitive devices” on page 98.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables necessary to replace the device.
3. Remove the top cover.
4. Remove all fans (see “Hot-swap fan” on page 101).
5. Remove the memory cards (see “Removing and replacing a memory card” on page 108).
6. Lift the microprocessor-tray release latch, open the microprocessor-tray levers, and pull the microprocessor tray out of the server slightly (see “Removing and installing a microprocessor” on page 122).
7. Remove the power supplies and the power-supply structure (see “Power-supply structure” on page 119).
8. Remove the screws that secure the power backplane to the chassis and lift the power backplane out of the server.

To install a power backplane, complete the following steps:

1. Align the power backplane in the server and secure the power backplane with screws.
2. Install the power-supply structure and the power supplies.
3. Slide the microprocessor tray in the server and close the microprocessor-tray levers.
4. Install the memory cards.
5. Install the fans.
6. Replace the top cover.

7. Reconnect the external cables and power cords.



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## Chapter 5. Configuration information and instructions

This chapter provides information about updating the firmware and using the configuration utilities.

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### Updating the firmware

The firmware in your server is periodically updated and is available for download on the Web. Go to <http://www.ibm.com/pc/support/> to check for the latest level of firmware, such as BIOS code, vital product data (VPD) code, device drivers, and service processor firmware.

The Update*Xpress* program is available for most xSeries servers and server options. It detects supported and installed device drivers and firmware in your server and installs available updates. You can download the Update*Xpress* program from the Web at no additional cost, or you can purchase it on a CD. To download the program or purchase the CD, go to <http://www.ibm.com/pc/ww/eserver/xseries/serverguide/xpress.html>.

When replacing devices in the server, you might have to either update the server with the latest version of the firmware stored on the board or restore the pre-existing firmware from a diskette or CD image.

- BIOS code and the diagnostics programs are stored in ROM on the microprocessor board.
- BMC firmware is stored in ROM on the baseboard management controller on the microprocessor board.
- Ethernet firmware is stored in ROM on the Ethernet controller on the PCI-X board.
- ServeRAID firmware is stored in ROM on the ServeRAID adapter.
- SAS firmware is stored in ROM on the SAS controller on the I/O board.
- Major components contain VPD code. You can select to update the VPD code during the BIOS code update procedure.

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### Configuring the server

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

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

- Update*Xpress* program
- Configuration/Setup Utility program
- Baseboard management controller utility programs
- Preboot Execution Environment (PXE) boot agent utility program
- SAS/SATA Configuration Utility program
- ServeRAID Manager

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

## Using the ServerGuide Setup and Installation CD

The *ServerGuide Setup and Installation CD* provides programs to detect the server model and installed hardware options, configure the server hardware, provide device drivers, and help you install the operating system. For information about the supported operating-system versions, see the label on the CD. If the *ServerGuide Setup and Installation CD* did not come with your server, you can download the latest version from <http://www.ibm.com/pc/qtechinfo/MIGR-4ZKPPT.html>.

Complete the following steps to start the *ServerGuide Setup and Installation CD*:

1. Insert the CD, and restart the server.
2. Follow the instructions on the screen to:
  - a. Select your language.
  - b. Select your keyboard layout and country.
  - c. View the overview to learn about ServerGuide features.
  - d. View the readme file to review installation tips about your operating system and adapter.
  - e. Start the setup and hardware configuration programs.
  - f. Start the operating-system installation. You will need your operating-system CD.

## Using the Configuration/Setup Utility program

Use the Configuration/Setup Utility program to:

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

Go to <http://www.ibm.com/pc/support/> to check for the latest version of the BIOS code.

### Starting the Configuration/Setup Utility program

To start the Configuration/Setup Utility program, complete the following steps:

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



## Configuration/Setup Utility menu choices

The following choices are on the Configuration/Setup Utility main menu. Depending on the version of the BIOS code in the server, some menu choices might differ slightly from these descriptions.

- **System Summary**

Select this choice to view configuration information, including the type, speed, and cache sizes of the microprocessors, type and speed of installed USB devices, and the amount of installed memory. When you make configuration changes through other options in the Configuration/Setup Utility program, the changes are reflected in the system summary; you cannot change settings directly in the system summary.

This choice is on the full and limited Configuration/Setup Utility menu.

- **System Information**

Select this choice to view information about the server. When you make changes through other options in the Configuration/Setup Utility program, some of those changes are reflected in the system information; you cannot change settings directly in the system information.

This choice is on the full Configuration/Setup Utility menu only.

- **Product Data**

Select this choice to view the machine type and model of the server, the serial number, the revision level or issue date of the BIOS and diagnostics code stored in electrically erasable programmable ROM (EEPROM), and the revision level of the firmware on the Remote Supervisor Adapter II SlimLine.

- **System Card Data**

Select this choice to view vital product data (VPD) for some server components.

- **Devices and I/O Ports**

Select this choice to view or change assignments for devices and input/output (I/O) ports.

Select this choice to enable or disable integrated SAS and Ethernet controllers and all standard ports (such as serial and parallel). **Enable** is the default setting for all controllers. If you disable a device, it cannot be configured, and the operating system will not be able to detect it (this is equivalent to disconnecting the device). If you disable the integrated Ethernet controller and no Ethernet adapter is installed, the server will have no Ethernet capability. If you disable the integrated USB controller, the server will have no USB capability; to maintain USB capability, make sure that **Enabled** is selected for the **USB Host Controller** and **USB BIOS Legacy Support** options.

**Note:** If the USB host controller is disabled, the Remote Supervisor Adapter II SlimLine remote keyboard, remote mouse, remote disk, OS watchdog, and in-band management functions are also disabled.

This choice is on the full Configuration/Setup Utility menu only.

- **Date and Time**

Select this choice to set the date and time in the server, in 24-hour format (*hour.minute:second*).

This choice is on the full Configuration/Setup Utility menu only.

- **System Security**

Select this choice to set passwords. See “Passwords” on page 136 for more information about passwords. You can also enable the chassis-intrusion detector to alert you each time the server cover is removed.

This choice is on the full Configuration/Setup Utility menu only.

- **Power-on Password**

Select this choice to set or change a power-on password. See “Power-on password” on page 136 for more information.

- **Administrator Password**

**Attention:** If you set an administrator password and then forget it, there is no way to change, override, or remove it. You must replace the I/O board.

Select this choice to set or change an administrator password. An administrator password is intended to be used by a system administrator; it limits access to the full Configuration/Setup Utility menu. If an administrator password is set, the full Configuration/Setup Utility menu is available only if you type the administrator password at the password prompt. See “Administrator password” on page 137 for more information.

This choice is on the Configuration/Setup Utility menu only if an IBM Remote Supervisor Adapter II SlimLine is installed.

- **Start Options**

Select this choice to view or change the start options. Changes in the start options take effect when you restart the server.

You can specify whether the server starts with the keyboard number lock on or off. You can enable the server to run without a diskette drive, monitor, or keyboard.

The startup sequence specifies the order in which the server checks devices to find a boot record. The server starts from the first boot record that it finds. If the server has Wake on LAN hardware and software and the operating system supports Wake on LAN functions, you can specify a startup sequence for the Wake on LAN functions.

If you enable the boot fail count, the BIOS default settings will be restored after three consecutive failures to find a boot record.

You can enable a virus-detection test that checks for changes in the boot record when the server starts.

You can enable the use of a USB keyboard in a DOS or System Setup environment. If a PS/2 keyboard is detected, the USB legacy operation will be disabled.

This choice is on the full Configuration/Setup Utility menu only.

- **Advanced Setup**

Select this choice to change settings for advanced hardware features.

**Important:** The server might malfunction if these options are incorrectly configured. Follow the instructions on the screen carefully.

This choice is on the full Configuration/Setup Utility menu only.

- **System Partition Visibility**

Select this choice to specify whether the System Partition is to be visible or hidden.

- **PCI Slot/Device Information**

Select this choice to view system resources used by installed PCI/PCI-X devices. PCI/PCI-X devices are usually configured automatically. This information is saved when you exit. The **Save Settings**, **Restore Settings**, and **Load Default Settings** choices on the Configuration/Setup Utility main menu do not save the PCI Slot/Device Information settings.

This selection is only available when a Remote Supervisor II Adapter SlimLine is installed in the server.

- **Memory Settings**

Select this choice to manually enable a pair of memory connectors. If a memory error is detected during POST or memory configuration, the server automatically disables the failing pair of memory connectors and continues operating with reduced memory. After the problem is corrected, you must manually enable memory connectors. Use the arrow keys to highlight the pair of memory connectors that you want to enable, and use the arrow keys to select **Enable**.
- **CPU Options**

Select this choice to enable or disable the Hyper-Threading Technology.
- **Baseboard management controller (BMC) settings**

Select this choice to view information and to change baseboard management controller (BMC) settings.

  - **BMC Firmware Ver**

This is a nonselectable menu item that displays the BMC firmware version.
  - **BMC POST Watchdog**

Enable or disable the BMC POST watchdog. **Disable** is the default setting.
  - **BMC POST Watchdog Timeout**

Set the BMC POST watchdog timeout value. **5 minutes** is the default setting.
  - **System-BMC Serial Port Sharing**

Enable or disable the system BMC serial port sharing. **Enable** is the default setting.
  - **BMC Serial Port Access Mode**

Share or disable the BMC serial port access mode. **Shared** is the default setting.
  - **Reboot System on NMI**

If you enable this option, the server automatically restarts 60 seconds after the service processor issues a nonmaskable interrupt (NMI) to the server. If you disable this option, the server does not restart. **Enable** is the default setting.
  - **BMC Network Configuration**

Select this choice to view the BMC Network Configuration information.
  - **BMC System Event Log**

To view the BMC System Event Log, which contains all system error and warning messages that have been generated. Use the arrow keys to move between pages in the log. If an optional IBM Remote Supervisor Adapter II SlimLine is installed, the full text of the error messages is displayed; otherwise, the log contains only numeric error codes. Run the diagnostic program to get more information about error codes that occur. See Chapter 2, “Diagnostics,” on page 11 for instructions. Select **Clear error logs** to clear the BMC system event log.
- **Error Logs**

Select this choice to view or clear error logs.

This choice is available on the full Configuration/Setup Utility menu only.

  - **POST Error Log**

Select this choice to view the three most recent error codes and messages that were generated during POST. Select **Clear error logs** to clear the POST error log.
- **Save Settings**

Select this choice to save the changes you have made in the settings.

- **Restore Settings**

Select this choice to cancel the changes you have made in the settings and restore the previous settings.

- **Load Default Settings**

Select this choice to cancel the changes you have made in the settings and restore the factory settings.

- **Exit Setup**

Select this choice to exit from the Configuration/Setup Utility program. If you have not saved the changes you have made in the settings, you are asked whether you want to save the changes or exit without saving them.

## Passwords

From the **System Security** choice, you can set, change, and delete a power-on password and an administrator password. The **System Security** choice is on the full Configuration/Setup menu only.

If you set only a power-on password, you must type the power-on password to complete the system startup, and you have access to the full Configuration/Setup Utility menu.

An administrator password is intended to be used by a system administrator; it limits access to the full Configuration/Setup Utility menu. If you set only an administrator password, you do not have to type a password to complete the system startup, but you must type the administrator password to access the Configuration/Setup Utility menu.

If you set a power-on password for a user and an administrator password for a system administrator, you can type either password to complete the system startup. A system administrator who types the administrator password has access to the full Configuration/Setup Utility menu; the system administrator can give the user authority to set, change, and delete the power-on password. A user who types the power-on password has access to only the limited Configuration/Setup Utility menu; the user can set, change, and delete the power-on password, if the system administrator has given the user that authority.

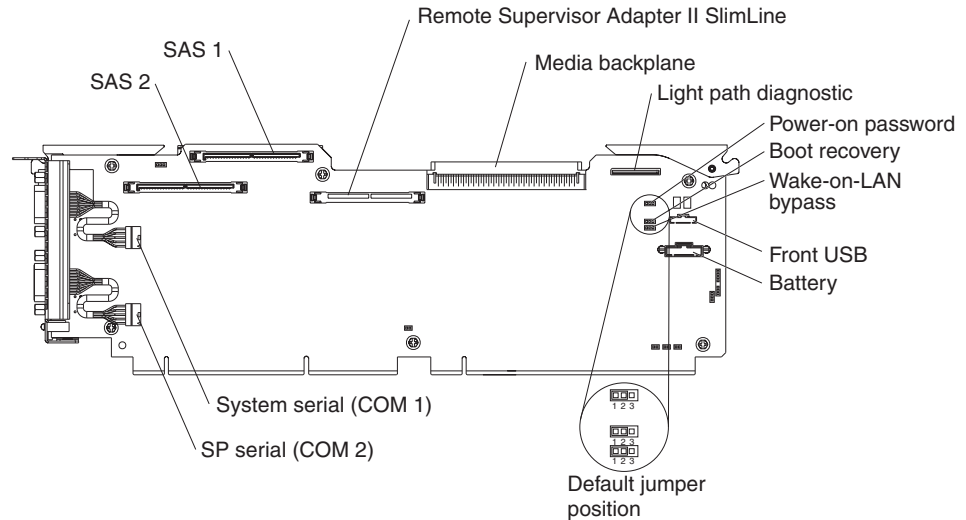
**Power-on password:** If a power-on password is set, when you turn on the server, the system startup will not be completed until you type the power-on password. You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for the password.

When a power-on password is set, you can enable the Unattended Start mode, in which the keyboard and mouse remain locked but the operating system can start. You can unlock the keyboard and mouse by typing the power-on password.

If you forget the power-on password, you can regain access to the server in any of the following ways:

- If an administrator password is set, type the administrator password at the password prompt. Start the Configuration/Setup Utility program and reset the power-on password.
- Remove the server battery and then reinstall it. See “Battery” on page 100 for instructions for removing the battery.
- Change the position of the power-on password override jumper (J9 on the I/O board) to bypass the power-on password check.

**Attention:** Before changing any switch settings or moving any jumpers, turn off the server; then, disconnect all power cords and external cables. See the safety information beginning on page vii. Do not change settings or move jumpers on any system-board switch or jumper blocks that are not shown in this document. The following illustration shows the location of the power-on password override, boot recovery, and Wake on LAN (WOL) bypass jumpers.



While the server is turned off, move the jumper on J9 from pins 1 and 2 to pins 2 and 3. You can then start the Configuration/Setup Utility program and reset the power-on password. After you reset the password, turn off the server again and move the jumper back to pins 1 and 2.

The power-on password override switch does not affect the administrator password.

**Administrator password:** If an administrator password is set, you must type the administrator password for access to the full Configuration/Setup Utility menu. You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for the password. The **Administrator Password** choice is on the Configuration/Setup Utility menu only if an optional IBM Remote Supervisor Adapter II SlimLine is installed.

**Attention:** If you set an administrator password and then forget it, there is no way to change, override, or remove it. You must replace the I/O board.

## Installing and using the baseboard management controller utility programs

The baseboard management controller provides environmental monitoring for the server. If environmental conditions exceed thresholds or if system components fail, the baseboard management controller lights LEDs to help you diagnose the problem and also records the error in the System Event/Error log.

Also use the baseboard management controller to establish a Serial over LAN (SOL) connection to manage servers from a remote location. You can remotely view and change the BIOS settings, restart the server, identify the server, and perform other management functions. Any standard Telenet client application can access the SOL connection.

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

Go to <http://www.ibm.com/pc/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 baseboard management controller firmware before updating the BIOS code.

## Using the SAS/SATA Configuration Utility program

Use the SAS/SATA Configuration Utility program to view or change SAS controller settings.

Complete the following steps to start the SAS/SATA Configuration Utility program:

1. Turn on the server.
2. When the message Press <CTRL><A> for Adaptec SAS/SATA Configuration Utility appears, press Ctrl+A. If an administrator password has been set, you are prompted to type the password.
3. Follow the instructions on the screen to configure the controller settings.

Go to <http://www.ibm.com/pc/support/> to check for the latest version of the SAS firmware.

## Configuring the Ethernet controller

The Ethernet controller is integrated on the system board. It provides an interface for connecting to a 10-Mbps, 100-Mbps, or 1-Gbps network and provides full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the network. If the Ethernet ports in the server support auto-negotiation, the controller detects the data-transfer rate (10BASE-T, 100BASE-TX, or 1000BASE-T) and duplex mode (full-duplex or half-duplex) of the network and automatically operates at that rate and mode.

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

## Using the PXE boot agent utility program

The Preboot Execution Environment (PXE) boot agent utility program is part of the BIOS code. You can use it to specify the startup order of devices and enable or disable operating-system wake-up support.

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

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

1. Turn on the server.

2. When the Initializing Intel (R) Boot Agent Version X.X.XX PXE 2.0 Build XXX (wfm 2.0) prompt appears, press Ctrl+S. You have 2 seconds (by default) to press Ctrl+S after the prompt appears. If the prompt does not appear, use the Configuration/Setup Utility program to enable the Ethernet PXE/DHCP option.
3. Use the arrow keys and press Enter to select a choice from the menu.
4. Follow the instructions on the screen to change the settings of the selected items; then, press Enter.

## Using the ServeRAID configuration programs

A ServeRAID controller enables you to configure multiple physical hard disk drives to operate as logical drives in a disk array. The controller comes with a CD containing the ServeRAID Manager program and the ServeRAID Mini-Configuration program, which you can use to configure the ServeRAID controller. For information about these programs, see the documentation that comes with the ServeRAID controller and the *User's Guide* on the IBM *xSeries Documentation CD*. If your server comes with an operating system installed, such as Microsoft Windows 2000 Datacenter Server, see the software documentation that comes with the server for configuration information.





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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 @server 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. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination Guide* on the IBM xSeries Documentation CD or IBM BladeCenter Documentation CD or in the IntelliStation *Hardware Maintenance Manual* at the IBM support Web site.
- Go to the IBM support Web site at <http://www.ibm.com/pc/support/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the 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 @server 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 @server or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/pc/support/> and follow the instructions. Also, some publications are available 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 @server and IntelliStation products, services, and support. The address for IBM xSeries and BladeCenter information is <http://www.ibm.com/eserver/xseries/>. The address for IBM IntelliStation information is <http://www.ibm.com/pc/us/intellistation/>.

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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.

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## Battery return program

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In the Netherlands, the following applies.



For Taiwan: Please recycle batteries.



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