IBM System x3350 Type 4192 and 4193

# Problem Determination and Service Guide

IBM System x3350 Type 4192 and 4193

# 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 221 and the Warranty and Support Information document on the IBM System x *Documentation* CD.

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# Contents


**Safety** . . . . . vii
Guidelines for trained service technicians . . . . . viii
Inspecting for unsafe conditions . . . . . viii
Guidelines for servicing electrical equipment . . . . . viii
Safety statements . . . . . x

**Chapter 1. Introduction** . . . . . 1
Related documentation . . . . . 1
Notices and statements in this document . . . . . 2
Features and specifications . . . . . 3
Server controls, LEDs, and connectors . . . . . 5
Front view . . . . . 5
Rear view . . . . . 7
Internal LEDs, connectors, and jumpers . . . . . 8
System-board internal connectors . . . . . 8
Power backplane card internal connectors . . . . . 9
System-board switches and jumpers . . . . . 10
System-board external connectors . . . . . 11
System-board LEDs . . . . . 12
System-board optional-device connectors . . . . . 13

**Chapter 2. Configuration information and instructions** . . . . . 15
Updating the firmware . . . . . 15
Configuring the server . . . . . 15
Using the Configuration/Setup Utility program . . . . . 16
Using the Boot Menu program . . . . . 23
Using the ServerGuide Setup and Installation CD . . . . . 24
Using the LSI Logic Configuration Utility program . . . . . 26
Using the baseboard management controller . . . . . 27
Enabling the Broadcom Gigabit Ethernet Utility program . . . . . 41
Configuring the Broadcom NetXtreme Gigabit Ethernet controller . . . . . 41
Updating IBM Director . . . . . 42
Setting up a Remote Supervisor Adapter II SlimLine . . . . . 42

**Chapter 3. Parts listing, System x3350 Type 4192 and 4193 server** . . . . . 45
Replaceable server components . . . . . 47
Power cords . . . . . 49

**Chapter 4. Removing and replacing server components** . . . . . 53
Installation guidelines . . . . . 53
System reliability guidelines . . . . . 54
Working inside the server with the power on . . . . . 55
Handling static-sensitive devices . . . . . 55
Returning a device or component . . . . . 55
Connecting the cables . . . . . 56
Removing and replacing Tier 1 CRUs . . . . . 57
Removing the cover . . . . . 57
Installing the cover . . . . . 58
Removing the side air baffle . . . . . 59
Installing the side air baffle . . . . . 59
Removing the center air baffle . . . . . 60
Installing the center air baffle . . . . . 61
Removing a riser-card assembly . . . . . 62

Installing a riser-card assembly . . . . . 63
Removing an adapter . . . . . 64
Installing an adapter . . . . . 65
Removing a Remote Supervisor Adapter II SlimLine . . . . . 66
Installing a Remote Supervisor Adapter II SlimLine. . . . . 66
Removing and installing internal drives . . . . . 68
Removing the CD-RW/DVD drive interposer card . . . . . 72
Installing the CD-RW/DVD drive interposer card. . . . . 73
Removing a memory module (DIMM). . . . . 74
Installing a memory module (DIMM) . . . . . 75
Removing an optional ServeRAID-MR10i SAS/SATA controller . . . . . 78
Installing an optional ServeRAID-MR10i SAS/SATA controller . . . . . 78
Removing a power supply . . . . . 79
Installing a power supply . . . . . 80
Removing a hot-swap fan assembly . . . . . 81
Installing a hot-swap fan assembly . . . . . 82
Removing the battery . . . . . 83
Installing the battery . . . . . 84
Removing and replacing Tier 2 CRUs . . . . . 85
Removing and installing a disk drive cage assembly . . . . . 85
Removing the media bezel . . . . . 88
Installing the media bezel . . . . . 89
Removing the mini-SAS/SATA controller (hot-swap models) . . . . . 90
Installing the mini-SAS/SATA controller (hot-swap models) . . . . . 90
Removing the 3.5-inch SAS/SATA hot-swap backplane or SATA simple-swap backplate . . . . . 92
Installing the 3.5-inch SAS/SATA hot-swap backplane or SATA simple-swap backplate . . . . . 92
Removing the 2.5-inch SAS backplane . . . . . 93
Installing the 2.5-inch SAS backplane . . . . . 94
Removing a SATA RAID backplate . . . . . 95
Installing a SATA RAID backplate . . . . . 96
Removing the power backplane. . . . . 96
Installing the power backplane . . . . . 98
Removing and replacing FRUs . . . . . 99
Removing a microprocessor . . . . . 99
Installing a microprocessor . . . . . 100
Removing the operator information panel assembly . . . . . 103
Installing the operator information panel assembly . . . . . 104
Removing the system board . . . . . 106
Installing the system board . . . . . 108

**Chapter 5. Diagnostics** . . . . . 111
Diagnostic tools . . . . . 111
POST . . . . . 111
POST beep codes . . . . . 112
Error logs . . . . . 116
POST error codes . . . . . 117
Checkout procedure . . . . . 127
About the checkout procedure . . . . . 127
Performing the checkout procedure . . . . . 128
Troubleshooting tables . . . . . 129
CD or DVD drive problems . . . . . 129
General problems . . . . . 130
Hard disk drive problems. . . . . 130
Intermittent problems . . . . . 131

USB keyboard, mouse, or pointing-device problems . . . 132
Memory problems . . . 133
Microprocessor problems . . . 134
Monitor problems . . . 135
Optional-device problems . . . 137
Power problems . . . 138
Serial device problems . . . 139
ServerGuide problems . . . 140
Software problems . . . 141
Universal Serial Bus (USB) device problems . . . 142
Video problems . . . 142
Light path diagnostics . . . 142
Remind button . . . 144
Light path diagnostics LEDs . . . 144
Power-supply LEDs . . . 147
Diagnostic programs and messages . . . 148
Running the diagnostic programs . . . 149
Diagnostic text messages . . . 150
Viewing the test log . . . 150
Diagnostic messages . . . 151
Recovering from a BIOS update failure . . . 208
System event/error log messages . . . 210
Solving power problems . . . 215
Solving Ethernet controller problems . . . 215
Solving undetermined problems . . . 216
Problem determination tips . . . 217

**Appendix A. Getting help and technical assistance** . . . 219
Before you call . . . 219
Using the documentation . . . 219
Getting help and information from the World Wide Web . . . 219
Software service and support . . . 220
Hardware service and support . . . 220
IBM Taiwan product service . . . 220

**Appendix B. Notices** . . . 221
Trademarks . . . 221
Important notes . . . 222
Product recycling and disposal . . . 223
Battery return program . . . 224
German Ordinance for Work gloss statement . . . 226
Electronic emission notices . . . 226
Federal Communications Commission (FCC) statement . . . 226
Industry Canada Class A emission compliance statement . . . 226
Avis de conformité à la réglementation d'Industrie Canada . . . 226
Australia and New Zealand Class A statement . . . 226
United Kingdom telecommunications safety requirement . . . 226
European Union EMC Directive conformance statement . . . 227
Taiwanese Class A warning statement . . . 227
Chinese Class A warning statement . . . 227
Japanese Voluntary Control Council for Interference (VCCI) statement 228
Korean Class A warning statement . . . 228

**Index** . . . 229

# Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

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 pečítaje 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 49.
   - 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 you service 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 you use 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 you measure 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 is labeled 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 is labeled "Statement 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 you perform the procedures. Read any additional safety information that comes with the 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:** | **To Disconnect:** |
|---|---|
| 1. Turn everything OFF. | 1. Turn everything OFF. |
| 2. First, attach all cables to devices. | 2. First, remove power cords from outlet. |
| 3. Attach signal cables to connectors. | 3. Remove signal cables from connectors. |
| 4. Attach power cords to outlet. | 4. Remove all cables from devices. |
| 5. Turn device ON. | |

**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.**

Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil À Laser de Classe 1

**Statement 4:**

≥ 18 kg (39.7 lb)

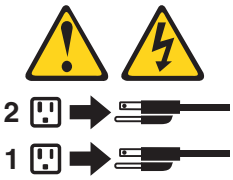
≥ 32 kg (70.5 lb)

≥ 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 26:**

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

**Attention:** This server is suitable for use on an IT power distribution system whose maximum phase to phase voltage is 240 V under any distribution fault condition.

# Chapter 1. Introduction

This *Problem Determination and Service Guide* contains information to help you solve problems that might occur in your IBM® System x3350 Type 4192 or 4193 server. It describes the diagnostic tools that come with the server, error codes and suggested actions, and instructions for replacing failing components.

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** 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.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

## Related documentation

In addition to this document, the following documentation also comes with the server:

- *Installation Guide*

  This printed document contains instructions for setting up the server and basic instructions for installing some optional devices.
- *User's Guide*

  This document is in Portable Document Format (PDF) on the IBM *System x 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 *System x 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 IBM *System x Documentation* CD. It contains information about the terms of the warranty and getting service and assistance.

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

The System x and xSeries Tools Center is an online information center that contains information about tools for updating, managing, and deploying firmware, device drivers, and operating systems. The System x and xSeries Tools Center is at http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp.

The server might have features that are not described in the documentation that comes with the server. The documentation might be updated occasionally to include information about those features, or technical updates might be available to provide additional information that is not included in the server documentation. These updates are available from the IBM Web site. To check for updated documentation and technical updates, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Publications lookup**.
4. From the **Product family** menu, select **System x3350** and click **Continue**.

## Notices and statements in this document

The caution and danger statements in this document are also in the multilingual *Safety Information* document, which is on the IBM *System x 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 might 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*

**Microprocessor:**

- Supports one Intel® Xeon™ dual-core or quad-core microprocessor
- 4 MB or 8 MB Level-2 cache
- 1066 or 1333 MHz front-side bus (FSB)

**Note:** Use the Configuration/Setup Utility Program to determine the type and speed of the microprocessor.

**Memory:**

- Minimum: 1 GB
- Maximum: 8 GB
- Type: PC2-5300, dual-data-rate 2 (DDR2), unbuffered, error correcting code (ECC) DIMMs with a minimum data transfer rate of 667 MHz
- Slots: Four dual inline
- Supports 512 MB, 1 GB, and 2 GB DIMMs

**Drives:**

- CD-RW/DVD combo: IDE
- Multi-burner Ultrabay Enhanced (optional)

**Expansion bays (depending on model):**

- Hot-swap hard disk drive bays: One of the following configurations:
  - Two 3.5-inch drive bays (SAS or SATA)
  - Four 2.5-inch drive bays (SAS)
- Simple-swap disk drive bays: Two 3.5-inch drive bays (SATA)

**PCI Expansion slots:**

Two PCI Express x8 (full height, half length) slots. Each slot requires a PCI riser card.

**Power supply:**

Maximum of two redundant 450-watt (100 - 240V ac auto-sensing) hot-swap power supplies

**Hot-swap fans:**

Standard: four

**Size:**

- Height: 43 mm (1.69 inches, 1 U)
- Depth: 711 mm (28 inches)
- Width: 440 mm (17.3 inches)
- Maximum weight: 15.6 kg (34 lb) when fully configured

**Integrated functions:**

- Two Broadcom 5722 multi-speed, single-port GB Ethernet controller with Wake on LAN® support
- Four Universal Serial Bus (USB) 2.0 ports (two front and two rear)
- One Advanced System Management RJ-45 port (active only when a Remote Supervisor Adapter II SlimLine is installed)
- One serial port
- Serial ATA (SATA) controller without RAID (simple-swap SATA models)
- Serial-attached SCSI (SAS) controller with integrated RAID (hot-swap SAS/SATA models)

**Acoustical noise emissions:**

- Sound power, idling: 6.5 bels maximum
- Sound power, operating: 6.5 bels maximum

**Environment:**

- Air temperature:
  - Server on: 10° to 35°C (50.0° to 95°F); altitude: 0 to 914.4 m (3000 ft)
  - Server on: 10° to 32°C (50.0° to 89.6°F); maximum altitude: 2133.6 m (6998.0 ft)
  - Server off: 10° to 43°C (50.0° to 109.4°F); maximum altitude: 2133.6 m (6998.0 ft)
  - Shipping -40° to 60°C (-40° to 60°C (-40° to 140°F); maximum altitude: 2133.6 m (6998.0 ft)
- Humidity:
  - Server on: 8% to 80%
  - Server off: 8% to 80%

**Heat output:**

Approximate heat output in British thermal units (Btu) per hour:

- Minimum configuration: 396 Btu per hour (116 watts)
- Maximum configuration: 1365 Btu per hour (400 watts)

**Electrical input:**

- Sine-wave input (50 - 60 Hz) required
- Input voltage low range:
  - Minimum: 100 V ac
  - Maximum: 127 V ac
- Input voltage high range:
  - Minimum: 200 V ac
  - Maximum: 240 V ac
- Input kilovolt-amperes (kVA), approximately:
  - Minimum: 0.116 kVA
  - Maximum: 0.400 kVA

**Video controller (integrated):**

- ATI Radeon ATI ES 1000 (dual ports - front and rear)
- Flexible memory support
  - 16 MB video memory
  - DDR2 SDRAM

**Notes:**

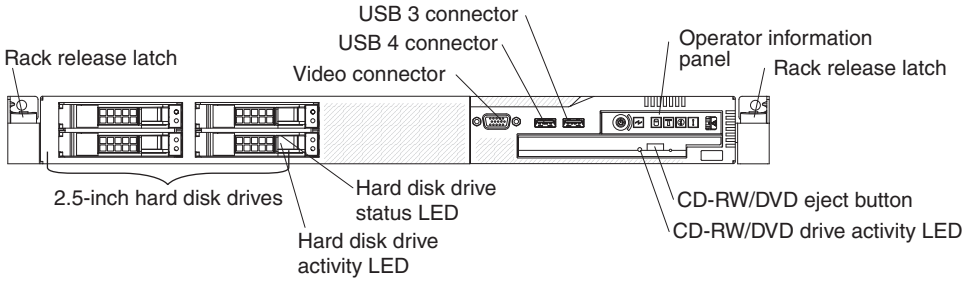
1. Power consumption and heat output vary depending on the number and type of optional features that are installed and the power-management optional features in use.
2. These levels were measured in controlled acoustical environments according to the procedures that are specified by C-S 1-1710-008 (8803) “Acoustical Noise Measurement on IBM Products - sound power and pressure level” and are reported in accordance with C-S-1710-024 (8803). Actual sound-pressure levels in a given location might exceed the average stated values 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.

## Server controls, LEDs, and connectors

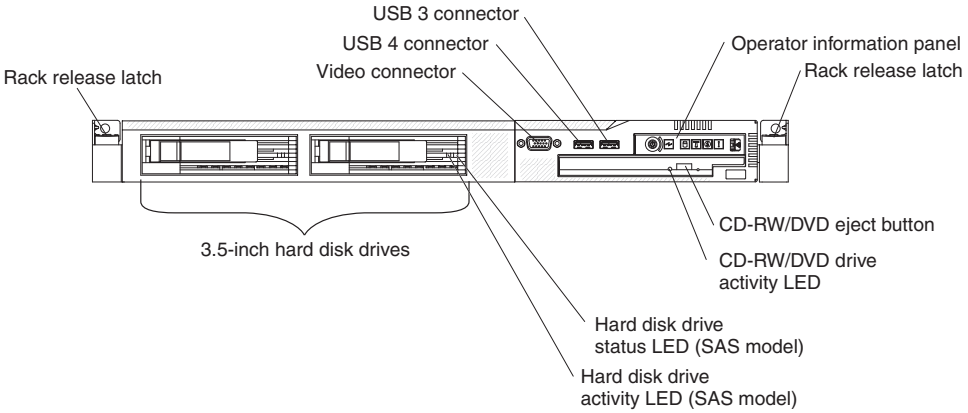
This section describes the controls, light-emitting diodes (LEDs), and connectors on the front and rear of the server.

## Front view

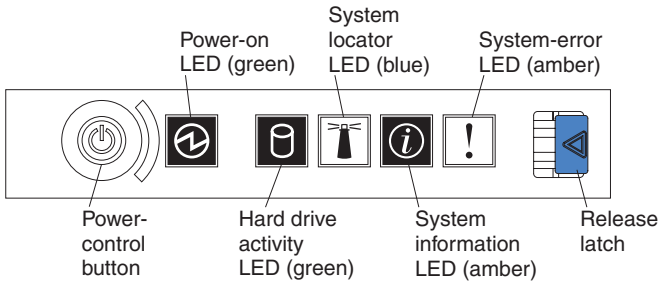
The following illustration shows the 2.5-inch hard disk drive server model.




The following illustration shows the hot-swap or simple-swap 3.5-inch hard disk drive server model.




- The following illustration shows the operator information panel. This panel contains controls and LEDs that indicate the status of the server.




  – **Power-on LED:** When this green LED is lit and not flashing, it indicates that the server is turned on. When this LED is flashing, it indicates that the server is turned off and is still connected to an ac power source. When this LED is off, it indicates that ac power is not present, or the power supply or the LED itself has failed. A power LED is also on the rear of the server.

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

- **System-locator LED:** Use this blue LED to visually locate the server among other servers. You can use IBM Director to light this LED remotely. This LED is controlled by the BMC.
- **System-error LED:** When this amber LED is lit, it indicates that a system error has occurred. A system-error LED is also on the rear of the server. An LED on the light path diagnostics panel on the system board is also lit to help isolate the error. This LED is controlled by the BMC.
- **Release latch:** Slide this latch to the left to access the light path diagnostics panel that is behind the operator information panel.
- **System-information LED:** When this amber LED is lit, it indicates that a noncritical event has occurred. An LED on the light path diagnostics panel is also lit to help isolate the error.
- **Hard drive activity LED:** When this green LED is lit, it indicates that one of the hard disk drives is in use.

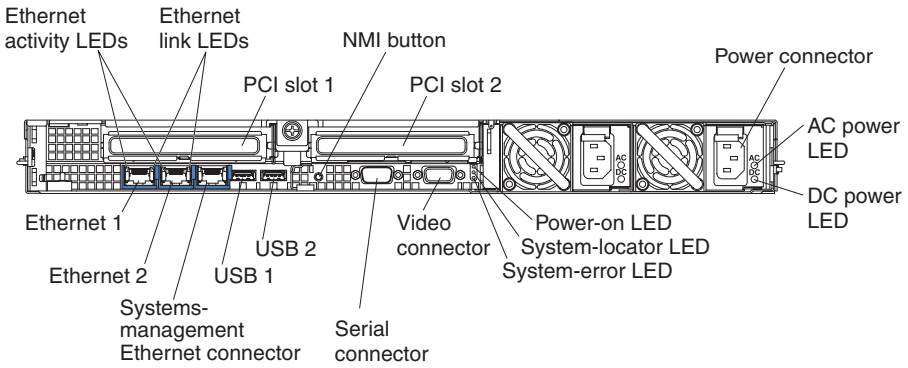
  **Notes:**

  1. For a SAS drive, a hard disk drive activity LED is shown in two places: on the hard disk drive and on the operator information panel.
  2. For a SATA drive, hard disk drive activity is indicated only by the hard disk drive activity LED on the operator information panel.
- **Power-control button:** Press this button to turn the server on and off manually.

- **Rack release latches:** Press the latches on each front side of the server to release the server from the rack.
- **Video connector:** Connect a monitor to this connector. The video connectors on the front and rear of the server can be used simultaneously.
- **USB connectors:** Connect a USB device, such as a USB mouse, keyboard, or other device to any of these connectors.
- **CD-RW/DVD eject button:** Press this button to release a DVD or CD from the CD-RW/DVD drive.
- **CD-RW/DVD drive activity LED:** When this LED is lit, it indicates that the CD-RW/DVD drive is in use.
- **Hard disk drive status LED:** This LED is used on SAS hard disk drives. When this LED is lit, it indicates that the drive has failed.
- **Hard disk drive activity LED:** This LED is used on SAS hard disk drives. Each hot-swap hard disk drive has an activity LED, and when this LED is flashing, it indicates that the drive is in use.

## Rear view

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




- **PCI slots 1 and 2:** Connect the PCI Express adapter to these connectors.
- **NMI button:** (For service only) This button can be used to generate a non-maskable interrupt (NMI) to the server.:
- **Power connector:** Connect the power cord to this connector.
- **AC power LED:** Each hot-swap power supply has an ac power LED and a dc power LED. When the ac power LED is lit, it indicates that sufficient power is coming into the power supply through the power cord. During typical operation, both the ac and dc power LEDs are lit. For any other combination of LEDs, see “Power-supply LEDs” on page 147.
- **DC power LED:** Each hot-swap power supply has a dc power LED and an ac power LED. When the dc power LED is lit, it indicates that the power supply is supplying adequate dc power to the system. During typical operation, both the ac and dc power LEDs are lit. For any other combination of LEDs, see the “Power-supply LEDs” on page 147
- **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.
- **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.
- **System-locator LED:** Use this LED to visually locate the server among other servers. You can use IBM Director to light this LED remotely.
- **Video connector:** Connect a monitor to this connector. The video connectors on the front and rear of the server can be used simultaneously.
- **Serial connector:** Connect a 9-pin serial device to this connector. The serial port is shared with the baseboard management controller (BMC). The BMC can take control of the shared serial port to perform text console redirection and to redirect serial traffic, using Serial over LAN (SOL).
- **USB connectors:** Connect a USB device, such as a USB mouse, keyboard, or other device to any of these connectors.
- **Systems-management Ethernet connector:** Use this connector to connect the server to a network for systems-management information control. This connector is active only if you have installed a Remote Supervisor Adapter II SlimLine, and it is used only by the Remote Supervisor Adapter II SlimLine.

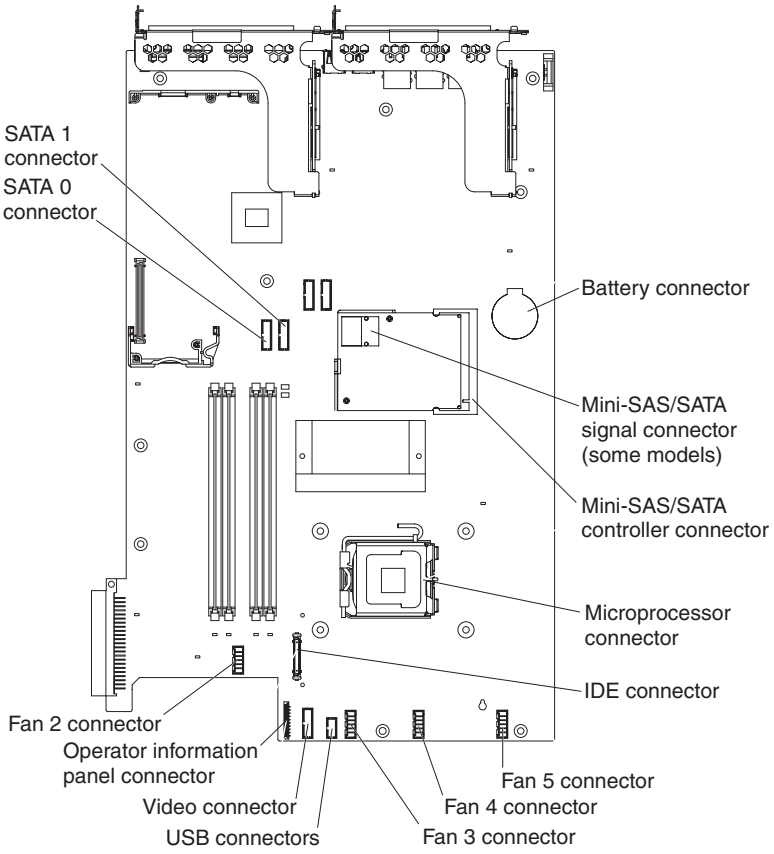
- **Ethernet activity LEDs:** When these LEDs are lit, they indicate that the server is transmitting to or receiving signals from the Ethernet LAN that is connected to the Ethernet port.
- **Ethernet status LEDs:** When these LEDs are lit, they indicate that there is an active link connection on the 10BASE-T, 100BASE-TX, or 1000BASE-TX interface for the Ethernet port.
- **Ethernet connectors:** Use either of these connectors to connect the server to a network.

## Internal LEDs, connectors, and jumpers

The illustrations in this section show the connectors, LEDs, and jumpers on the internal boards. The illustrations might differ slightly from your hardware.

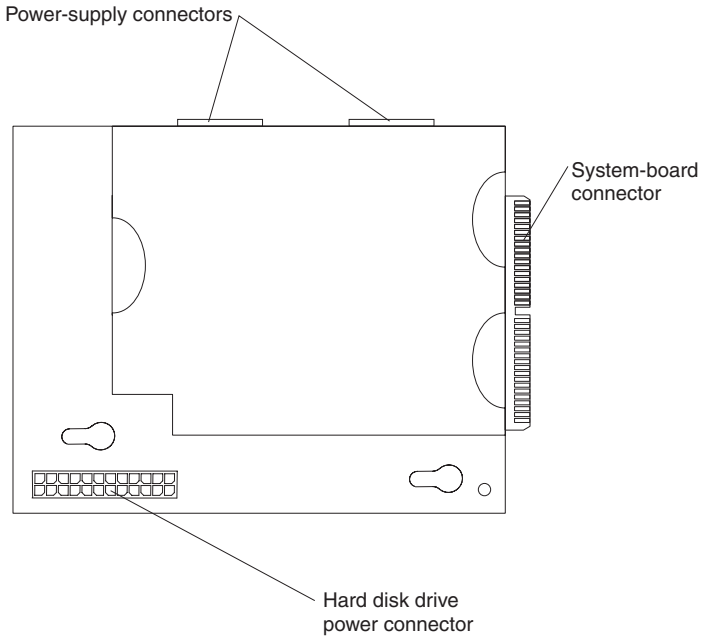
## System-board internal connectors

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



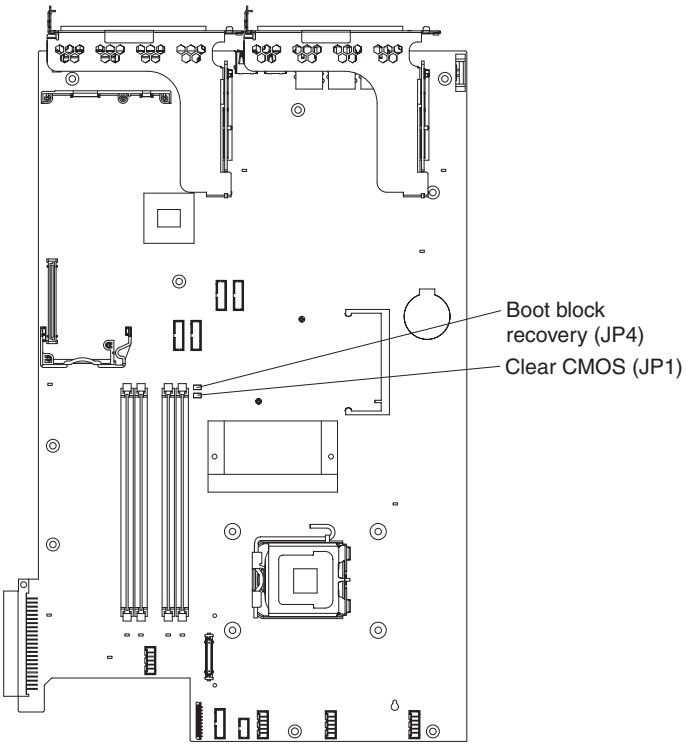
## Power backplane card internal connectors

The following illustration shows the internal connectors on the power backplane card.



## System-board switches and jumpers

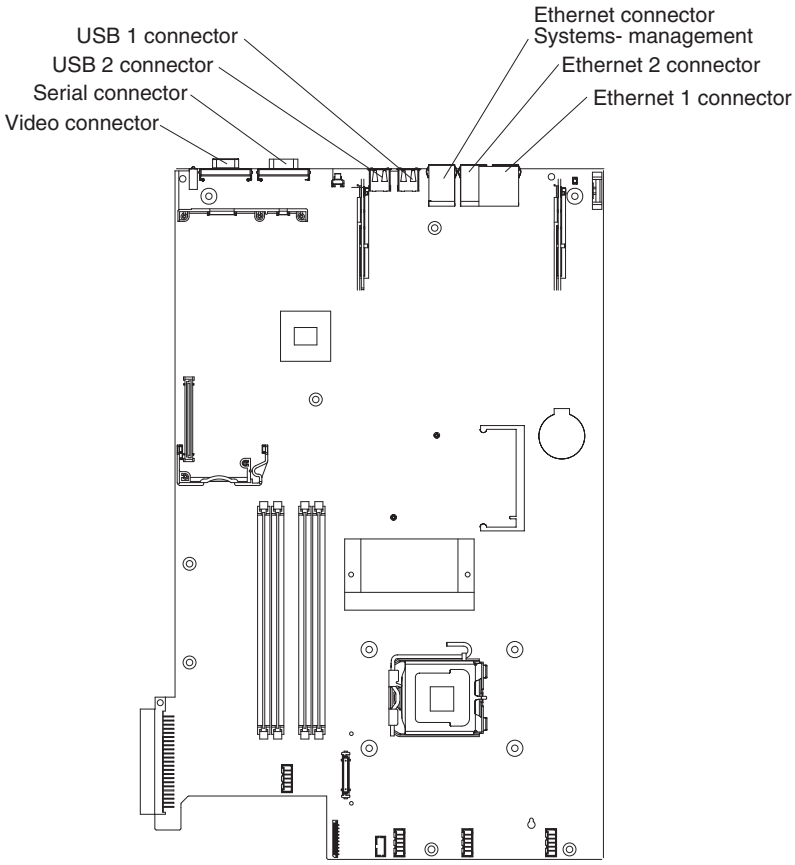
The following illustration shows the switches and jumpers on the system board.




| Jumper | Description |
|---|---|
| Clear CMOS (JP1) | • Pins 1 and 2: Keep CMOS data (default)<br>• Pins 2 and 3: Clear the CMOS data, which clears the power-on password and administrator password |
| Boot block recovery (JP4) | • Pins 1 and 2: Normal (default).<br>• Pins 2 and 3: Recover boot block |

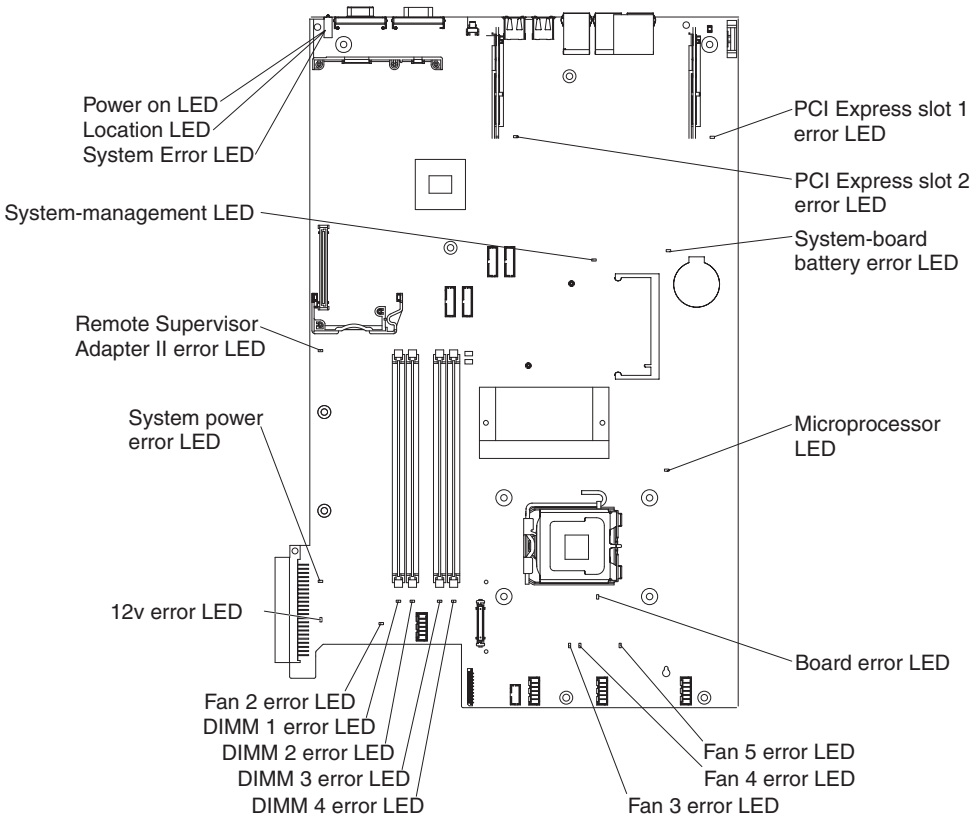
## System-board external connectors

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



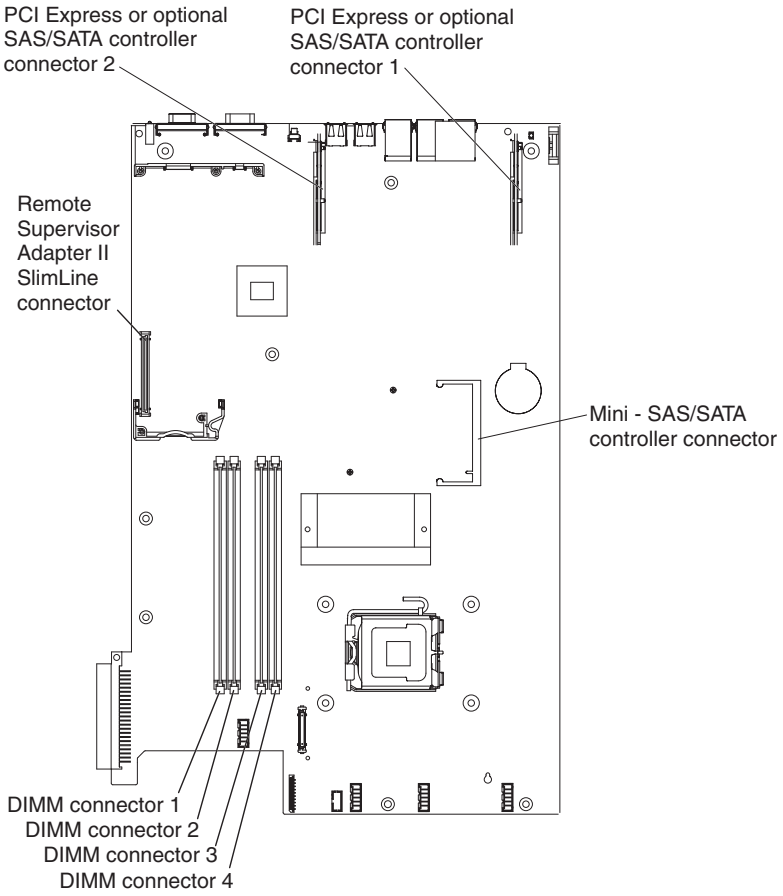
## System-board LEDs

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



## System-board optional-device connectors

The following illustration shows the connectors for user-installable options.



# Chapter 2. Configuration information and instructions

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

## Updating the firmware

The firmware in the server is periodically updated and is available for download on the Web. Go to http://www.ibm.com/systems/support/ to check for the latest level of firmware, such as BIOS code, device drivers, and service processor firmware.

When you replace a device in the server, you might have to either update the server with the latest version of the firmware that is stored in memory on the device or restore the pre-existing firmware from a diskette or CD image.

- BIOS code is stored in ROM on the system board.
- The diagnostic programs are provided on the diagnostics CD.
- BMC firmware is stored in ROM on the baseboard management controller on the system board.
- Ethernet firmware is stored in ROM on the Ethernet controller.
- ServeRAID firmware is stored in ROM on the ServeRAID adapter.
- SATA firmware (simple-swap models) is stored in ROM on the integrated SATA controller.
- SAS/SATA firmware (hot-swap models) is stored in ROM on the SAS/SATA controller on the system board.

## Configuring the server

The following configuration programs come with the server:

- **Configuration/Setup Utility program**

  The Configuration/Setup Utility program is part of the basic input/output system (BIOS). Use it to change interrupt request (IRQ) settings, change the startup-device sequence, set the date and time, and set passwords. For information about using this program, see “Using the Configuration/Setup Utility program” on page 16.

  **Note:** In a multi-node configuration, some choices or settings are defined through the primary server, and others must be defined on the individual (secondary) servers. Before you create a scalable partition, make sure that choices and settings on the secondary servers are correct

- **Boot Menu program**

  The Boot Menu program is part of the BIOS. Use it to override the startup sequence that is set in the Configuration/Setup Utility program and temporarily assign a device to be first in the startup sequence.

- **IBM *ServerGuide™ Setup and Installation* CD**

  The ServerGuide program provides software-setup tools and installation tools that are designed for the server. Use this CD during the installation of the server to configure basic hardware features, such as an integrated SAS controller with RAID capabilities, and to simplify the installation of your operating system. For information about using this CD, see “Using the ServerGuide Setup and Installation CD” on page 24.

- **Baseboard management controller utility programs**

Use these programs to configure the baseboard management controller, to update the firmware and sensor data record/field replaceable unit (SDR/FRU) data, and to remotely manage a network. For information about using these programs, see “Using the baseboard management controller” on page 27.

- **Ethernet controller configuration**

  For information about configuring the Ethernet controller, see “Configuring the Broadcom NetXtreme Gigabit Ethernet controller” on page 41.

- **IBM Director**

  IBM Director is a workgroup-hardware-management tool that you can use to centrally manage System x servers. If you plan to use IBM Director to manage the server, you must check for the latest applicable IBM Director update and interim fixes. for information about updating IBM Director, see “Updating IBM Director” on page 42. For more information about IBM Director, see the IBM Director documentation on the IBM *Director* CD that comes with the server.

- **LSI Logic Configuration Utility program**

  Use the LSI Logic Configuration Utility program to configure devices that are attached to the SAS/SATA controller. For information about using this program, see "Using the LSI Logic Configuration Utility program" on page 43.

  **Important**: If the server is a simple-swap SATA model and you have installed an optional SATA RAID Kit, you can use the LSI Logic Configuration Utility program to configure the simple-swap SATA hard disk drives.

- **Remote Supervisor Adapter II SlimLine configuration**

  For information about setting up and cabling a Remote Supervisor Adapter II SlimLine for use in an Advanced System Management (ASM) network, see “Setting up a Remote Supervisor Adapter II SlimLine” on page 42.

## Using the Configuration/Setup Utility program

Use the Configuration/Setup Utility program to perform the following tasks:

- View configuration information
- View and change assignments for devices and I/O ports
- Set the date and time
- Set and change passwords and Remote Control Security settings
- 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
- Resolve configuration conflicts

### 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` is displayed, 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, some menu choices might differ slightly from these descriptions.

- **System Summary**

  Select this choice to view configuration information, including the amount of installed memory. When you make configuration changes through other choices 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.

  – **Processor Summary**

    Select this choice to view the processor information, including the type, speed and cache size of the microprocessor.

- **System Information**

  Select this choice to view information about the server, such as machine type/model, system serial number, system UUID, system board identifier, and the system asset tag. You can also view the version, date, and build level of the BIOS and the ASM Adapter ROM. You cannot change the system information settings.

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

- **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 Ethernet controllers and all standard ports (such as serial and USB). **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 controllers and no Ethernet adapter is installed, you 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 **USB Controller** on the **USB Support** menu.

  If the server is a SATA model, select this choice to determine the programming interface for the SATA port.

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

  – **Remote Console Redirection**
    Select this choice to configure the remote console serial port, enable remote keyboard redirection, and to set other remote console values.

  – **USB Support**
    Select this choice to enable or disable the USB controller and the USB ports.

  – **Video**
    Select this choice to view display information about the video controller and video memory size.

  – **System MAC Addresses**
    Select this choice to display the MAC address for the network devices that are installed in the server.

- **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 21 for more information.

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

– **Administrator Password**

  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. For more information, see “Administrator password” on page 22.

– **Power-on Password**

  Select this choice to set or change a power-on password. See “Power-on password” on page 21 for more information.

• **Start Options**

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

  You can view the Planar PXE/DHCP priority, PCI device boot priority, and whether the server starts with the keyboard number lock on or off. You can enable or disable displayless operation, boot on POST/BIOS error, boot fail count, the F12 menu prompt, and HDD S.M.A.R.T capability.

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

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

  – **Startup Sequence Options**

    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. For example, you can define a startup sequence that checks for a disc in the CD-RW/DVD-ROM drive, then checks the hard disk drive, and then checks a network adapter.

• **Advanced Setup**

  Select this choice to change settings for advanced hardware features.

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

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

  – **CPU Options**

    Select this choice to enable or disable core-multi processing, execute-disable bit capability, EIST Function and Virtualization Technology for the microprocessor. Virtualization Technology enables the microprocessor to appear to be a dedicated processor to each running application in the system.

  – **PCI Bus Control**

    Select this choice to view the system resources that are used by installed PCI Express devices, configure PCI interrupt routing, and enable or disable PCI ROM Control Execution.

– **RSA II Settings**

  Select this choice to view and change Remote Supervisor Adapter II SlimLine settings. Select **Save Values and Reboot RSA II** to save the changes that you make in the settings and restart the Remote Supervisor Adapter II SlimLine.

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

  - **RSA II MAC Address**
    This is a nonselectable menu item that displays the Remote Supervisor Adapter II MAC address.
  - **DHCP IP Address**
    This is a nonselectable menu item that displays the DHCP IP address.
  - **DHCP Control**
    Select this choice to determine whether the DHCP or static IP address will be used. **Try DHCP then use static IP** is the default. If you select **Use Static IP configuration**, use the **Static IP Address** choice to set the address. If you select **Try DHCP then use static IP**, you can also use the **Static IP Address** choice to set the address. The Remote Supervisor Adapter II will attempt to acquire an IP address from the DHCP server. If it fails, the Remote Supervisor Adapter II will use the static IP address.
  - **Static IP Settings**
    This is a nonselectable menu item that displays the static IP settings.
  - **Static IP Address**
    Select this choice to configure the IP address for the Remote Supervisor Adapter II . This address is unselectable if **DHCP Control** is set to **DHCP Enabled**.
  - **Subnet Mask**
    Select this choice to configure the subnet mask address for the Remote Supervisor Adapter II. This address is unselectable if **DHCP Control** is set to **DHCP Enabled**.
  - **Gateway**
    Select this choice to configure the gateway address for the Remote Supervisor Adapter II. This address is unselectable if **DHCP Control** is set to **DHCP Enabled**.
  - **OS USB Selection**
    Select this choice to specify whether Linux or other operating systems will be used for the Remote Supervisor Adapter II USB. The default is **Other OS**.
  - **Save Values and Reboot RSA II**
    Select this choice and press Enter to save any changes that you make to the Remote Supervisor Adapter II configuration and to reboot the Remote Supervisor Adapter II.
  - **<<<RESTORE RSA II DEFAULTS>>>**
    Select this choice and press the Enter to restore the Remote Supervisor Adapter II default settings.

– **Baseboard Management Controller (BMC) Settings**

  Select this choice to change settings for the BMC.

  - **IPMI Specification Version**
    This is a nonselectable menu item that displays the IPMI specification version.
  - **BMC Firmware Version**
    This is a nonselectable menu item that displays the BMC firmware version.

- **BMC Build Date**
  This is a nonselectable menu item that displays the BMC firmware build date.
- **BMC Build Level**
  This is a nonselectable menu item that displays the BMC firmware build level.
- **Existing Event Log Number**
  This is a nonselectable menu item that displays the number of entries in the BMC system event log.
- **BMC POST Watchdog**
  Select this choice to enable or disable the BMC POST watchdog. **Disabled** is the default setting.
- **BMC POST Watchdog Timeout**
  Select this choice to set the BMC POST watchdog timeout value. **5 minutes** is the default setting
- **System - BMC Serial Port Sharing**
  Select this choice to enable or disable sharing of the serial port between the BMC and the system. **Disabled** is the default setting; it assigns the serial port to the BMC exclusively.
- **BMC Serial Port Access Mode**
  If serial port sharing is enabled, select this choice to specify the times and conditions during which the BMC shares the serial port.
- **Reboot System on NMI**
  Select this choice to enable or disable restarting the system whenever a nonmaskable interrupt (NMI) occurs. **Enabled** is the default.
- **User Account Settings**
  Select this choice to define user names and passwords for logging in to the BMC to remotely control settings on the server.
- **BMC Network Configuration**
  Select this choice to view the BMC MAC address, the BMC IP address and configure DHCP control.
- **BMC System Event Log**
  Select this choice to view the BMC system event log, which contains messages about system events, such as the event entry number, timestamp, sensor type, sensor number, and event description. Select **Clear BMC SELs** to clear the BMC system event log.

– **High Precision Event Timer**

  Select this choice to enable or disable the high precision event timer.

• **Event/Error Logs**

  Select this choice to view and clear the System Event/Error Log and the Remote Supervisor Adapter II event/error log.

– **System Event/Error Log**

  Select this choice to view the events and errors that were generated during POST and by the system management interface (SMI) handler. The most recent event is displayed first. Use the arrow keys to move among pages in the log. Select **Clear System Logs** to clear the system event/error log.

– **RSA II Event/Error Log**

  This choice is available only if an optional Remote Supervisor Adapter II SlimLine is installed.

Select this choice to view the error messages in the Remote Supervisor Adapter II event/error log. Use the arrow keys to move among pages in the log. Select **Clear RSA II logs** to clear the Remote Supervisor Adapter II event/error log.

The Remote Supervisor Adapter II event/error log contains all event and error messages that have been generated during POST, by the system interface handler, and by the system service processor. The most recent event or error is displayed first.

**Important:** If the system-error LED on the front of the server is lit but there are no other error indications, clear the Remote Supervisor Adapter II event/error log. This log does not clear itself, and if it begins to fill up, the system-error LED will be lit.

- **Save Settings**

  Select this choice to save the changes that you have made in the settings.
- **Restore Settings**

  Select this choice to cancel the changes that you have made in the settings and restore the previous settings.
- **Load Default Settings**

  Select this choice to cancel the changes that 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 that 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 to 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, you must type the power-on password to complete the system startup. You can use any combination of up to seven characters (A – Z, a – z, and 0 – 9) for the password.

If 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:

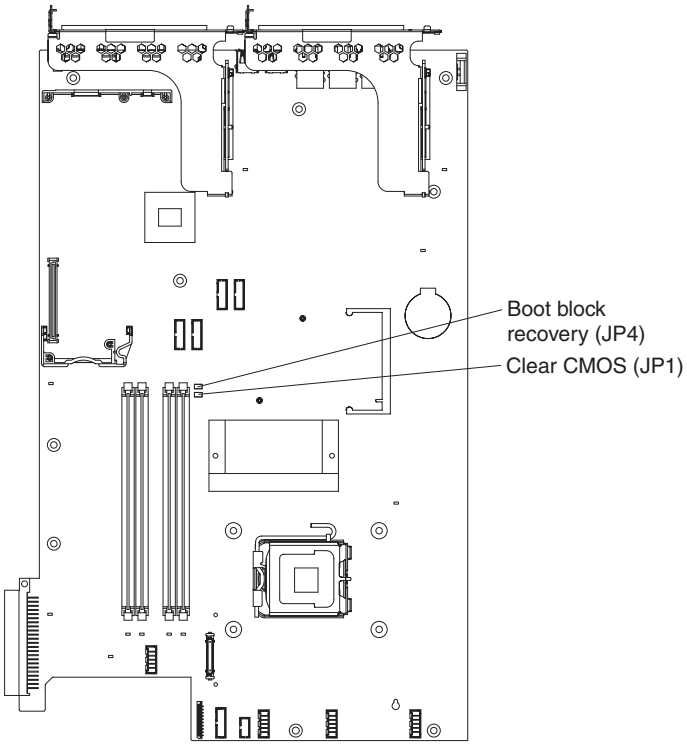
- If an administrator password is set, type the administrator password at the password prompt. Start the Configuration/Setup Utility program and reset the power-on password.
- Remove the battery from the server and then reinstall it (see “Removing the battery” on page 83 and “Installing the battery” on page 84).
- Change the position of the clear CMOS jumper on the system board to bypass the power-on password check. See "Resetting passwords" for additional information.

  **Attention:** Before you change any switch settings or move any jumpers, turn off the server; then, disconnect all power cords and external cables. See the safety information that begins 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.

***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.

If you forget the administrator password, you can reset it after you change the position of the clear CMOS jumper. See “Resetting passwords” for additional information.

***Resetting passwords:*** If you forget the power-on password or administrator password you can move the clear CMOS jumper on the system board to pins 2 and 3 to clear CMOS memory and bypass the power-on or administrator password check. The jumper location is shown in the following illustration.




To clear CMOS memory and reset the passwords, complete the following steps:

1. Review the safety information that begins on page vii.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables.
3. Remove the cover. See “Removing the cover” on page 57.
4. Move the clear CMOS jumper from pins 1 and 2 to pins 2 and 3 and leave it there for at least 5 seconds; then, move the jumper back to pins 1 and 2.
5. Replace the server cover. See “Installing the cover” on page 58.
6. Slide the server into the rack and connect the server to a keyboard, monitor, and mouse; then, connect the server to a power source.
7. Turn on the server. You can now start the Configuration/Setup Utility program and either delete the old password or set a new power-on or administrator password.

## Using the Boot Menu program

The Boot Menu program is a built-in, menu-driven configuration utility program that you can use to temporarily redefine the first startup device without changing settings in the Configuration/Setup utility program.

To use the Boot Menu program, complete the following steps:

1. Turn off the server.
2. Restart the server.
3. Press F12.
4. Select a device from the **Boot Menu**.
5. Select an option, and then select **Exit and continue booting**.

The next time the server starts, it returns to the startup sequence that is set in the Configuration/Setup Utility program.

# Using the ServerGuide Setup and Installation CD

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

If a later version of the ServerGuide program is available, you can download a free image of the *ServerGuide Setup and Installation* CD or purchase the CD from the ServerGuide fulfillment Web site at http://www.ibm.com/systems/management/serverguide/sub.html. To download the free image, click **IBM Service and Support Site**.

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

The ServerGuide program has the following features:

- An easy-to-use interface
- Diskette-free setup, and configuration programs that are based on detected hardware
- ServeRAID Manager program, which configures your ServeRAID adapter
- Device drivers that are provided for your server model and detected hardware
- Operating-system partition size and file-system type that are selectable during setup

## ServerGuide features

Features and functions can vary slightly with different versions of the ServerGuide program. To learn more about the version that you have, start the *ServerGuide Setup and Installation* CD and view the online overview. Not all features are supported on all server models.

The ServerGuide program requires a supported IBM server with an enabled startable (bootable) CD drive. In addition to the *ServerGuide Setup and Installation* CD, you must have your operating-system CD to install the operating system.

The ServerGuide program performs the following tasks:

- Sets system date and time
- Detects the RAID adapter or controller and runs the SAS RAID configuration program
- Checks the microcode (firmware) levels of a ServeRAID adapter and determines whether a later level is available from the CD
- Detects installed optional hardware devices and provides updated device drivers for most adapters and devices
- Provides diskette-free installation for supported Windows® operating systems
- Includes an online readme file with links to tips for hardware and operating-system installation

## Setup and configuration overview

When you use the *ServerGuide Setup and Installation* CD, you do not need setup diskettes. You can use the CD to configure any supported IBM server model. The setup program provides a list of tasks that are required to set up your server model.

On a server with a ServeRAID™ adapter or SAS/SATA controller with RAID capabilities, you can run the SAS RAID configuration program to create logical drives.

**Note:** Features and functions can vary slightly with different versions of the ServerGuide program.

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

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

## Typical operating-system installation

The ServerGuide program can reduce the time it takes to install an operating system. It provides the device drivers that are required for your hardware and for the operating system that you are installing. This section describes a typical ServerGuide operating-system installation.

**Note:** Features and functions can vary slightly with different versions of the ServerGuide program.

1. After you have completed the setup process, the operating-system installation program starts. (You will need your operating-system CD to complete the installation.)
2. The ServerGuide program stores information about the server model, service processor, hard disk drive controllers, and network adapters. Then, the program checks the CD for newer device drivers. This information is stored and then passed to the operating-system installation program.
3. The ServerGuide program presents operating-system partition options that are based on your operating-system selection and the installed hard disk drives.
4. The ServerGuide program prompts you to insert your operating-system CD and restart the server. At this point, the installation program for the operating system takes control to complete the installation.

## Installing your operating system without using ServerGuide

If you have already configured the server hardware and you are not using the ServerGuide program to install your operating system, complete the following steps to download the latest operating-system installation instructions from the IBM Web site.

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. Under **Product support**, click System x.
3. From the menu on the left side of the page, click **System x support search**.
4. From the **Task** menu, select **Install**.
5. From the **Product family** menu, select **System x3350**.
6. From the **Operating system** menu, select your operating system, and then click **Search** to display the available installation documents.

## Using the LSI Logic Configuration Utility program

Use the LSI Logic Configuration Utility program to configure and manage redundant array of independent disks (RAID) arrays of hot-swap disk drives. Be sure to use this program as described in this document.

**Important**: If the server is a simple-swap SATA model and you have installed an optional SATA RAID Kit, you can use the LSI Logic Configuration Utility program to configure the simple-swap SATA hard disk drives.

Use the LSI Logic Configuration Utility program to perform the following tasks:

- Perform a low-level format of a SAS/SATA hard disk drive
- Create an array of SAS/SATA hard disk drives with or without a hot-spare drive
- Set SAS/SATA protocol parameters on SAS/SATA hard disk drives.

The integrated SAS/SATA controller with RAID capabilities supports redundant array of independent disks (RAID) arrays. You can use the LSI Logic Configuration Utility program to configure RAID 1 (IM), RAID 1E (IME), and RAID 0 (IS) for a single pair of attached devices. If you install a different type of RAID controller, follow the instructions in the documentation that comes with the controller to view or change SAS/SATA settings for attached devices.

In addition, you can download an LSI command-line configuration program from http://www.ibm.com/systems/support/.

When you are using the LSI Logic Configuration Utility program to configure and manage arrays, consider the following information:

- The integrated SAS/SATA controller with RAID capabilities supports the following features:
  - Integrated Mirroring (IM) with hot-spare (also known as RAID 1)

    Use this option to create an integrated array of two disks plus an optional hot spare. All data on the primary disk can be migrated.
  - Integrated Mirroring Enhanced (IME) with hot-spare support (also known as RAID 1E).

    Use this option to create an integrated mirror enhanced array of three to eight disks, including an optional hot spare
  - Integrated Striping (IS) (also known as RAID 0)

    Use this option to create an integrated striping array of two to eight disks. All data on the array disk will be deleted.
- Hard disk drive capacities affect how you create arrays. The drives in an array can have different capacities, but the RAID controller treats them as if they all have the capacity of the smallest hard disk drive.
- If you use an integrated SAS/SATA controller with RAID capabilities to configure a RAID 1 (mirrored) array after you have installed the operating system, you will lose access to any data or applications that were previously stored on the secondary drive of the mirrored pair.
- If you install a different type of RAID controller, see the documentation that comes with the controller for information about viewing and changing SAS/SATA settings for attached devices.

### Starting the LSI Logic Configuration Utility program

To start the LSI Logic Configuration Utility program, complete the following steps:

1. Turn on the server.

2. When the prompt `Press CTRL-C to start LSI Logic Configuration Utility.....` is displayed, press Ctrl+C. If you have set an administrator password, you are prompted to type the password.
3. To select a controller (channel) from the list of adapters, use the arrow keys and press Enter.
4. To change the settings of the selected items, follow the instructions on the screen.

When you have finished changing settings, press Esc to exit from the program; select **Save** to save the settings that you have changed.

### Formatting a SAS/SATA hard disk drive

Low-level formatting removes all data from the hard disk. If there is data on the disk that you want to save, back up the hard disk before you perform this procedure.

**Note:** Before you format a SAS/SATA hard disk, make sure that the disk is not part of a mirrored pair. From the list of adapters, select the controller (channel) for the drive that you want to format. Select **SAS Topology**; then, select **Drive**and press Alt+D
.

To format a drive, complete the following steps:

1. From the list of adapters, select the controller (channel) for the drive that you want to format and press Enter.
2. Select **SAS Topology** and press Enter.
3. Select **Direct Attach Devices** and press Enter.
4. To highlight the drive that you want to format, use the Up Arrow and Down Arrow keys. To scroll left and right, use the Left Arrow and Right Arrow keys or the End key.
5. To start the love-level formatting operation, select **Format** and press Enter.

### Creating a RAID array of SAS/SATA hard disk drives

To create a RAID array of SAS/SATA hard disk drives, complete the following steps:

1. From the list of adapters, select the controller (channel) for the drives that you want to mirror.
2. Select **RAID Properties**.
3. Select the type of array that you want to create.
4. Use the arrow keys to highlight the first drive in the pair; then, press the Minus (-) or Plus (+) key until you have selected all the drives for your array.
5. Press C to create the disk array.
6. Select **Apply changes and exit menu** to create the array.

## Using the baseboard management controller

The baseboard management controller provides environmental monitoring for the server. If an environmental condition exceeds a threshold or if a system component fails, the baseboard management controller lights LEDs to help you diagnose the problem and also records the error in the system event/error log.

The baseboard management controller also provides the following remote server management capabilities through the OSA SMBridge management utility program:

- **Command-line interface (IPMI Shell)**

The command-line interface provides direct access to server management functions through the IPMI 2.0 protocol. Use the command-line interface to issue commands to control the server power, view system information, and identify the server. You can also save one or more commands as a text file and run the file as a script.

- **Serial over LAN**

  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 Telnet client application can access the SOL connection.

## Enabling and configuring SOL using the OSA SMBridge management utility program

To enable and configure the server for SOL by using the OSA SMBridge management utility program, you must update and configure the BIOS code; update and configure the baseboard management controller (BMC) firmware; update and configure the Ethernet controller firmware; and enable the operating system for an SOL connection.

***BIOS update and configuration:*** To update and configure the BIOS code to enable SOL, complete the following steps:

1. Update the BIOS code:
   a. Download the latest version of the BIOS code from http://www.ibm.com/systems/support/.
   b. Update the BIOS code, following the instructions that come with the update file that you downloaded.
2. Update the BMC firmware:
   a. Download the latest version of the BMC firmware from http://www.ibm.com/systems/support/.
   b. Update the BMC firmware, following the instructions that come with the updated file that you downloaded.
3. Configure the BIOS settings:
   a. When you are prompted to start the Configuration/Setup Utility program, restart the server and press F1.
   b. Select **Devices and I/O Ports**; then, make sure that the values are set as follows:
      - **Serial Port 1**: Auto-configure
   c. Select **Remote Console Redirection**; then, make sure that the values are set as follows:
      - **Remote Console Serial Port**: Serial Port 1 (BMC)
      - **Baud Rate**: 19200 or higher
      - **Console Type**: VT 100
      - **Flow Control**: None
      - **Remote Console Active After Boot**: On
   d. Press Esc twice to exit the **Remote Console Redirection** and **Devices and I/O Ports** sections of the Configuration/Setup Utility program.
   e. Select **Advanced Setup**; then, select **Baseboard Management Controller (BMC) Settings**.
   f. Select **System-BMC Serial Port Sharing** and set it to **Enabled**.
   g. Select **BMC Serial Port Access Mode** and set it to **Shared.**

h. Press Esc to exit the **BMC Serial Port Access Mode** section of the **Baseboard Management Controller (BMC) Settings**.
i. Press Esc to exit **Baseboard Management Controller (BMC) Settings**.
j. Select **Save Settings**; then, press Enter.
k. Press Enter to continue.
l. Select **Exit Setup**; then, press Enter.
m. Make sure that **Yes, exit the Setup Utility** is selected; then, press Enter.

***Linux configuration:*** For SOL operation on the server, you must configure the Linux® operating system to expose the Linux initialization (booting) process. This enables users to log in to the Linux console through an SOL session and directs Linux output to the serial console. See the documentation for your specific Linux operating-system type for information and instructions.

Use one of the following procedures to enable SOL sessions for your Linux operating system. You must be logged in as a root user to perform these procedures.

*Red Hat Enterprise Linux ES 2.1 configuration:*

**Note:** This procedure is based on a default installation of Red Hat Enterprise Linux ES 2.1. The file names, structures, and commands might be different for other versions of Red Hat Linux.

Complete the following steps to configure the general Linux parameters for SOL operation when you are using the Red Hat Enterprise Linux ES 2.1 operating system.

**Note:** Hardware flow control prevents character loss during communication over a serial connection. You must enable it when you are using a Linux operating system.

1. Add the following line to the end of the `# Run gettys in standard runlevels` section of the /etc/inittab file. This enables hardware flow control and enables users to log in through the SOL console.

   ```
   7:2345:respawn:/sbin/agetty -h ttyS0 19200 vt100
   ```

2. Add the following line at the bottom of the /etc/securetty file to enable a user to log in as the root user through the SOL console:

   ```
   ttyS0
   ```

*LILO configuration:* If you are using LILO, complete the following steps:

1. To modify the /etc/lilo.conf file, complete the following steps:
   a. Add the following text to the end of the first `default=linux` line

      ```
      -Monitor
      ```

   b. Comment out the `map=/boot/map` line by adding a `#` at the beginning of this line.
   c. Comment out the `message=/boot/message` line by adding a `#` at the beginning of this line.
   d. Add the following line before the first `image=` line:

      ```
      # This will allow you to only Monitor the OS boot via SOL
      ```

   e. Add the following text to the end of the first `label=linux` line:

      ```
      -Monitor
      ```

   f. Add the following line to the first `image=` section. This enables SOL.

      ```
      append="console=ttyS0,19200n8 console=tty1"
      ```

g. Add the following lines between the two `image=` sections:

```
# This will allow you to Interact with the OS boot via SOL
image=/boot/vmlinuz-2.4.9-e.12smp
    label=linux-Interact
    initrd=/boot/initrd-2.4.9-e.12smp.img
    read-only
    root=/dev/hda6
    append="console=tty1 console=ttyS0,19200n8 "
```

The following examples show the original content of the /etc/lilo.conf file and the content of this file after modification.

**Original /etc/lilo.conf contents**

```
prompt
timeout=50
default=linux
boot=/dev/hda
map=/boot/map
install=/boot/boot.b
message=/boot/message
linear
image=/boot/vmlinuz-2.4.9-e.12smp
    label=linux
    initrd=/boot/initrd-2.4.9-e.12smp.img
    read-only
    root=/dev/hda6
image=/boot/vmlinuz-2.4.9-e.12
    label=linux-up
    initrd=/boot/initrd-2.4.9-e.12.img
    read-only
    root=/dev/hda6
```

**Modified /etc/lilo.conf contents**

```
prompt
timeout=50
default=linux-Monitor
boot=/dev/hda
#map=/boot/map
install=/boot/boot.b
#message=/boot/message
linear
# This will allow you to only Monitor the OS boot via SOL
image=/boot/vmlinuz-2.4.9-e.12smp
    label=linux-Monitor
    initrd=/boot/initrd-2.4.9-e.12smp.img
    read-only
    root=/dev/hda6
    append="console=ttyS0,19200n8 console=tty1"
# This will allow you to Interact with the OS boot via SOL
image=/boot/vmlinuz-2.4.9-e.12smp
    label=linux-Interact
    initrd=/boot/initrd-2.4.9-e.12smp.img
    read-only
    root=/dev/hda6
    append="console=tty1 console=ttyS0,19200n8 "
image=/boot/vmlinuz-2.4.9-e.12
    label=linux-up
    initrd=/boot/initrd-2.4.9-e.12.img
    read-only
    root=/dev/hda6
```

2. Run the **lilo** command to store and activate the LILO configuration.

When the Linux operating system starts, a `LILO boot:` prompt is displayed instead of the graphical user interface. Press Tab at this prompt to install all of the boot options that are listed. To load the operating system in interactive mode, type `linux-Interact` and then press Enter.

*GRUB configuration:* If you are using GRUB, complete the following steps to modify the /boot/grub/grub.conf file:

1. Comment out the `splashimage=` line by adding a `#` at the beginning of this line.
2. Add the following line before the first `title=` line:
   ```
   # This will allow you to only Monitor the OS boot via SOL
   ```
3. Append the following text to the first `title=` line:
   ```
   SOL Monitor
   ```
4. Append the following text to the `kernel/` line of the first `title=` section:
   ```
   console=ttyS0,19200 console=tty1
   ```
5. Add the following five lines between the two `title=` sections:
   ```
   # This will allow you to Interact with the OS boot via SOL
   title Red Hat Linux (2.4.9-e.12smp) SOL Interactive
       root (hd0,0)
   ```

```
kernel /vmlinuz-2.4.9-e.12smp ro root=/dev/hda6 console=tty1
    console=ttyS0,19200
    initrd /initrd-2.4.9-e.12smp.img
```

**Note:** The entry that begins with `kernel /vmlinuz` is shown with a line break after `console=tty1`. In your file, the entire entry must all be on one line.

The following examples show the original content of the /boot/grub/grub.conf file and the content of this file after modification.

**Original /boot/grub/grub.conf contents**

```
#grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE: You have a /boot partition. This means that
#          all kernel and initrd paths are relative to /boot/, eg.
#          root (hd0,0)
#           kernel /vmlinuz-version ro root=/dev/hda6
#           initrd /initrd-version.img
#boot=/dev/hda
default=0
timeout=10
splashimage=(hd0,0)/grub/splash.xpm.gz
title Red Hat Enterprise Linux ES (2.4.9-e.12smp)
    root (hd0,0)
    kernel /vmlinuz-2.4.9-e.12smp ro root=/dev/hda6
    initrd /initrd-2.4.9-e.12smp.img
title Red Hat Enterprise Linux ES-up (2.4.9-e.12)
    root (hd0,0)
    kernel /vmlinuz-2.4.9-e.12 ro root=/dev/hda6
    initrd /initrd-2.4.9-e.12.img
```

**Modified /boot/grub/grub.conf contents**

```
#grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE: You have a /boot partition. This means that
#          all kernel and initrd paths are relative to /boot/, eg.
#          root (hd0,0)
#          kernel /vmlinuz-version ro root=/dev/hda6
#          initrd /initrd-version.img
#boot=/dev/hda
default=0
timeout=10
# splashimage=(hd0,0)/grub/splash.xpm.gz
# This will allow you to only Monitor the OS boot via SOL
title Red Hat Enterprise Linux ES (2.4.9-e.12smp) SOL Monitor
    root (hd0,0)
    kernel /vmlinuz-2.4.9-e.12smp ro root=/dev/hda6 console=ttyS0,19200 console=tty1
    initrd /initrd-2.4.9-e.12smp.img
# This will allow you to Interact with the OS boot via SOL
title Red Hat Linux (2.4.9-e.12smp) SOL Interactive
    root (hd0,0)
    kernel /vmlinuz-2.4.9-e.12smp ro root=/dev/hda6 console=tty1 console=ttyS0,19200
    initrd /initrd-2.4.9-e.12smp.img
title Red Hat Enterprise Linux ES-up (2.4.9-e.12)
    root (hd0,0)
    kernel /vmlinuz-2.4.9-e.12 ro root=/dev/hda6
    initrd /initrd-2.4.9-e.12.img
```

You must restart the Linux operating system after you complete these procedures for the changes to take effect and to enable SOL.

*SUSE SLES 8.0 configuration:*

**Note:** This procedure is based on a default installation of SUSE Linux Enterprise Server (SLES) 8.0. The file names, structures, and commands might be different for other versions of SUSE Linux.

Complete the following steps to configure the general Linux parameters for SOL operation when you are using the SLES 8.0 operating system.

**Note:** Hardware flow control prevents character loss during communication over a serial connection. You must enable it when you are using a Linux operating system.

1. Add the following line to the end of the `# getty-programs for the normal runlevels` section of the /etc/inittab file. This enables hardware flow control and enables users to log in through the SOL console.

   ```
   7:2345:respawn:/sbin/agetty -h ttyS0 19200 vt102
   ```

2. Add the following line after the `tty6` line at the bottom of the /etc/securetty file to enable a user to log in as the root user through the SOL console:

   ```
   ttyS0
   ```

3. Complete the following steps to modify the /boot/grub/menu.lst file:

a. Comment out the `gfxmenu` line by adding a `#` in front of the word `gfxmenu`.
b. Add the following line before the first `title` line:
```
# This will allow you to only Monitor the OS boot via SOL
```
c. Append the following text to the first `title` line:
```
SOL Monitor
```
d. Append the following text to the `kernel` line of the first `title` section:
```
console=ttyS0,19200 console=tty1
```
e. Add the following four lines between the first two `title` sections:
```
# This will allow you to Interact with the OS boot via SOL
title linux SOL Interactive
   kernel (hd0,1)/boot/vmlinuz root=/dev/hda2 acpi=oldboot vga=791
   console=tty1 console=ttyS0,19200
   initrd (hd0,1)/boot/initrd
```
The following examples show the original content of the /boot/grub/menu.lst file and the content of this file after modification.

| **Original /boot/grub/menu.lst contents** | **Notes** |
|---|---|
| `gfxmanu (hd0,1)/boot/message`<br>`color white/blue black/light-gray`<br>`default 0`<br>`timeout 8`<br><br>`title linux`<br>`  kernel (hd0,1)/boot/vmlinuz root=/dev/hda2 acpi=oldboot vga=791`<br>`  initrd (hd0,1)/boot/initrd`<br>`title floppy`<br>`  root`<br>`  chainloader +1`<br>`title failsafe`<br>`  kernal (hd0,1)/boot/vmlinuz.shipped root=/dev/hda2 ide=nodma apm=off vga=normal nosmp`<br>`disableapic maxcpus=0 3`<br>`  initrd (hd0,1)/boot/initrd.shipped` | 1<br><br>1 |
| **Note 1:** The kernel line is shown with a line break. In your file, the entire entry must all be on one line. | |

| **Modified /boot/grub/menu.lst contents** | **Notes** |
|---|---|
| `#gfxmanu (hd0,1)/boot/message`<br>`color white/blue black/light-gray`<br>`default 0`<br>`timeout 8`<br><br>`# This will allow you to only Monitor the OS boot via SOL`<br>`title linux SOL Monitor`<br>`  kernel (hd0,1)/boot/vmlinuz root=/dev/hda2 acpi=oldboot vga=791 console=ttyS0,19200`<br>`console=tty1`<br>`  initrd (hd0,1)/boot/initrd`<br>`# This will allow you to Interact with the OS boot via SOL`<br>`title linux SOL Interactive`<br>` kernel (hd0,1)/boot/vmlinuz root=/dev/hda2 acpi=oldboot vga=791 console=tty1 console=ttyS0,19200`<br>` initrd (hd0,1)/boot/initrd`<br>`title floppy` | 1 |

| Modified /boot/grub/menu.lst contents | Notes |
|---|---|
| root<br>chainloader +1<br>title failsafe<br>kernel (hd0,1)/boot/vmlinuz.shipped root=/dev/hda2 ide=nodma apm=off vga=normal nosmp disableapic maxcpus=0 3<br>initrd (hd0,1)/boot/initrd.shipped | 1 |
| **Note 1:** The kernel line is shown with a line break. In your file, the entire entry must all be on one line. | |

You must restart the Linux operating system after you complete these procedures for the changes to take effect and to enable SOL.

***Microsoft Windows 2003 Standard Edition configuration:***

**Note:** This procedure is based on a default installation of the Microsoft® Windows 2003 operating system.

Complete the following steps to configure the Windows 2003 operating system for SOL operation. You must be logged in as a user with administrator access to perform this procedure.

1. Complete the following steps to determine which boot entry ID to modify:
   a. Type `bootcfg` at a Windows command prompt; then, press Enter to display the current boot options for your server.
   b. In the `Boot Entries` section, locate the boot entry ID for the section with an OS friendly name of Windows Server 2003, Standard. Write down the boot entry ID for use in the next step.
2. To enable the Microsoft Windows Emergency Management System (EMS), at a Windows command prompt, type

   `bootcfg /EMS ON /PORT COM1 /BAUD 19200 /ID` *`boot_id`*

   where *boot_id* is the boot entry ID from step 1b; then, press Enter.
3. Complete the following steps to verify that the EMS console is redirected to the COM1 serial port:
   a. Type `bootcfg` at a Windows command prompt; then, press Enter to display the current boot options for your server.
   b. Verify the following changes to the bootcfg settings:
      - In the `Boot Loader Settings` section, make sure that `redirect` is set to `COM1` and that `redirectbaudrate` is set to `19200`.
      - In the `Boot Entries` section, make sure that the `OS Load Options:` line has `/redirect` appended to the end of it.

   The following examples show the original bootcfg program output and the output after modification.

**Original bootcfg program output**

```
Boot Loader Settings
----------------------------
timeout: 30
default: multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
Boot Entries
----------------
Boot entry ID: 1
OS Friendly Name: Windows Server 2003, Standard
Path: multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
OS Load Options: /fastdetect
```

**Modified bootcfg program output**

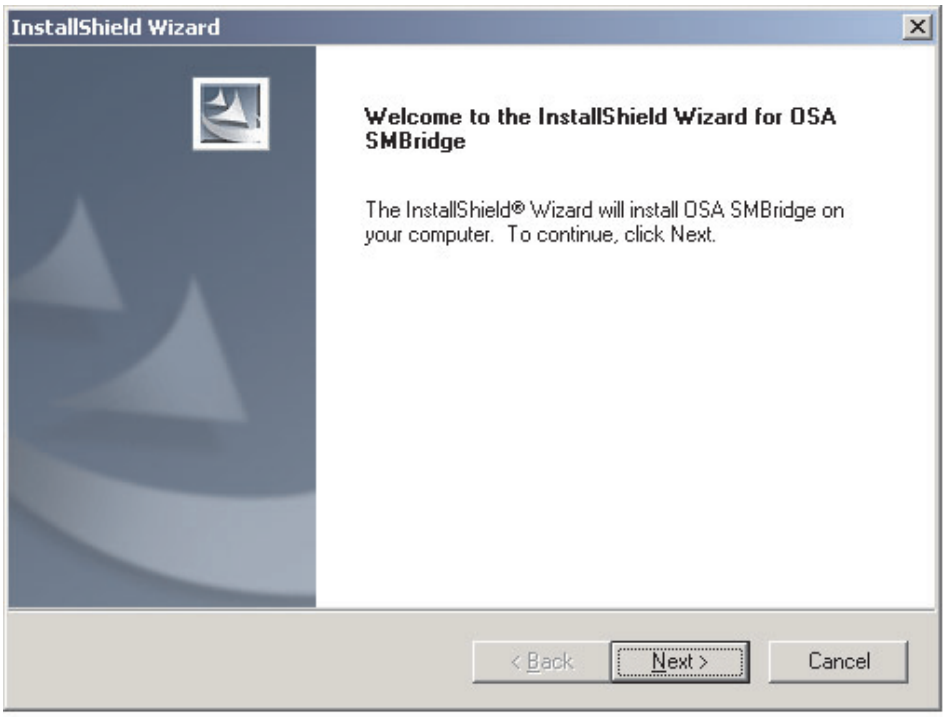
```
Boot Loader Settings
----------------------------
timeout: 30
default: multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
redirect: COM1
redirectbaudrate: 19200
Boot Entries
----------------
Boot entry ID: 1
OS Friendly Name: Windows Server 2003, Standard
Path: multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
OS Load Options: /fastdetect /redirect
```

You must restart the Windows 2003 operating system after you complete this procedure for the changes to take effect and to enable SOL.

## Installing the OSA SMBridge management utility program

Complete the following steps to install the OSA SMBridge management utility program on a server running a Windows operating system:

1. Go to http://www.ibm.com/systems/support/, download the utility program, and create the OSA BMC Management Utility CD.
2. Insert the OSA BMC Management Utility CD into the drive. The InstallShield wizard starts, and a window similar to that shown in the following illustration opens.




3. Follow the prompts to complete the installation.

   The installation program prompts you for a TCP/IP port number and an IP address. Specify an IP address, if you want to limit the connection requests that will be accepted by the utility program. To accept connections from any server, type `INADDR_ANY` as the IP address. Also specify the port number that the utility program will use. These values will be recorded in the smbridge.cfg file for the automatic startup of the utility program.

Complete the following steps to install the OSA SMBridge management utility program on a server running a Linux operating system. You must be logged in as a root user to perform these procedures.

1. Go to http://www.ibm.com/systems/support/. Download the utility program and create the OSA BMC Management Utility CD.
2. Insert the OSA BMC Management Utility CD into the drive.
3. Type `mount/mnt/cdrom`.
4. Locate the directory where the installation RPM package is located and type `cd/mnt/cdrom`.
5. Type the following command to run the RPM package and start the installation:

   ```
   rpm -ivh osasmbridge-2.0-xx.i386.rpm
   ```

6. Follow the prompts to complete the installation. When the installation is complete, the utility copies files to the following directories:
   - /etc/init.d/SMBridge
   - /etc/smbridge.cfg
   - /usr/sbin/smbridged
   - /var/log/smbridge
   - /var/log/smbridge/LICENSE

The utility starts automatically when the server is started. You can also locate the /etc/init.d directory to start the utility and use the following commands to manage the utility:

smbridge status
smbridge start
smbridge stop
smbridge restart

## Using the baseboard management controller utility programs

Use the baseboard management controller utility programs to configure the baseboard management controller, download firmware updates and SDR/FRU updates, and remotely manage a network.

***Using the baseboard management controller setup utility program:*** Use the baseboard management controller setup utility program to view or change baseboard management controller information, user management, LAN configuration, and LAN alert settings. To download the program, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Software and device drivers**.
4. Click **IBM System x3350** to display the matrix of downloadable files for the server.
5. From the BMC software, copy the files bmc.exe and Init.ini to a setup utility diskette.

To start the baseboard management controller setup utility program, complete the following steps:

1. Turn on the server.
2. Insert the setup utility diskette into the diskette drive.
3. From a command line, type `bmc` and press Enter.

For the program to interface with the baseboard management controller, the parameters in the Intf.ini file must be set correctly. To modify the Intf.ini file, select **0** from the main menu and use the arrow keys to select settings for the following parameters:

- **System interface**: This is the interface through which system software sends and receives messages to and from the baseboard management controller. Select **KCS** (keyboard controller style).
- **Port Address**: This is the base address for the system interface.
- **Register Spacing**: Select **ByteBoundary**, **ThirtyTwo BitBoundary**, or **SixteenBitBoundary**.
- **Channel Number**: Use the arrow keys to select the channel number (0 through 15).
- **DHCP Mode**: This is the LAN configuration address source.

***Using the baseboard management controller configuration utility program:*** Use the baseboard management controller configuration utility program to view or change the baseboard management controller configuration settings and to save the configuration to a file for use on multiple servers.

To download the program, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Software and device drivers**.
4. Click **IBM System x3350** to display the matrix of downloadable files for the server.
5. From the BMC software, copy the file bmc_cfg.exe to a configuration utility diskette.

To start the baseboard management controller configuration utility program, complete the following steps:

1. Turn on the server.
2. Insert the configuration utility diskette into the diskette drive.
3. From a command-line, type `bmc_cfg` and press Enter.

For the program to interface with the baseboard management controller, the parameters in the Intf.ini file must be set correctly. To modify the Intf.ini file, use the baseboard management controller setup utility program or a text editor.

***Using the baseboard management controller firmware update utility program:*** Use the baseboard management controller firmware update utility program to download a baseboard management controller firmware update. This program updates the baseboard management controller firmware only and does not affect any device drivers.

**Important**: To ensure proper server operation, be sure to update the server baseboard management controller firmware before you update the BIOS code.

To download the program, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Software and device drivers**.
4. Click **IBM System x3350** to display the matrix of downloadable files for the server.
5. From the BMC software, copy the file Flash.exe to a firmware update diskette.

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

- If the Linux or Windows operating-system update package is available from the World Wide Web and you have obtained it, follow the instructions that come with the package.
- If you are using a diskette, complete the following steps
  1. Turn on the server.
  2. Insert the firmware update diskette into the diskette drive.
  3. From a command line, type `flash -?` and press Enter.

For the program to interface with the baseboard management controller, the parameters in the Intf.ini file must be set correctly. To modify the Intf.ini file, use the baseboard management controller setup utility program or a text editor.

***Using the baseboard management controller SDR/FRU update utility program:*** Use the baseboard management controller SDR/FRU update utility program to download an SDR/FRU update.

To download the program, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Software and device drivers**.
4. Click **IBM System x3350** to display the matrix of downloadable files for the server.
5. From the BMC software, copy the file fsloader.exe to an SDR/FRU update diskette.

To start the baseboard management controller SDR/FRU update utility program, complete the following steps:

1. Turn on the server.
2. Insert the SDR/FRU update diskette into the diskette drive.
3. From a command line, type `fsloader -?` and press Enter.

***Using the OSA SMBridge management utility program:*** Use the OSA SMBridge management utility program to remotely manage and configure a network. The utility program provides the following remote management capabilities:

- **CLI (command-line interface) mode**

  Use CLI mode to remotely perform power-management and system identification control functions over a LAN or serial port interface from a command-line interface. Use CLI mode also to remotely view the system event/error log.

  Use the following commands in CLI mode:

  – **identify**

    Control the system-locator LED on the front of the server.

  – **power**

    Turn the server on and off remotely.

  – **sel**

    Perform operations with the system event/error log.

  – **sysinfo**

    Display general system information that is related to the server and the baseboard management controller.

- **Serial over LAN**

  Use the Serial over LAN capability to remotely perform control and management functions over a Serial over LAN (SOL) network. You can also use SOL to remotely view and change the server configuration settings.

  At a command prompt, type `telenet localhost 623` to access the SOL network. Type `help` at the `smbridge>` prompt for more information.

  Use the following commands in an SOL session:

  – **connect**

    Connect to the LAN. Type `connect -ip` *`ip_address`* `-u` *`username`* `-p` *`password`*.

  – **identify**

Control the system-locator LED on the front of the server.

- **power**

  Turn the server on and off remotely.
- **reboot**

  Force the server to restart.
- **sel get**

  Display the system event/error log.
- **sol**

  Configure the SOL function.
- **sysinfo**

  Display system information that is related to the server and the globally unique identifier (GUID).

## Enabling the Broadcom Gigabit Ethernet Utility program

The Broadcom Gigabit Ethernet Utility program is part of the BIOS. You can use it to configure the network as a startable device, and you can customize where the network startup option appears in the startup sequence. Enable and disable the Broadcom Gigabit Ethernet Utility program from the configuration/Setup Utility program

To enable the Broadcom Gigabit Ethernet Utility program, complete the following steps:

1. From the Configuration/Setup Utility main menu, select **Devices and I/O Ports** and press Enter.
2. Select **Planar Ethernet 1** and **Planar Ethernet 2** and use the Right Arrow key to set them to enabled.
3. Select **Save Settings** and press Enter.

## Configuring the Broadcom NetXtreme Gigabit 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 provide 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 controllers detect the data-transfer rate (10BASE-T, 100BASE-TX, or 1000BASE-T) and duplex mode (full-duplex or half-duplex) of the network and automatically operate at that rate and mode.

You do not have to set any jumpers or configure the controller. However, you must install a device driver to enable the operating system to address the controllers. For device drivers and information about configuring the Ethernet controller, see the *Broadcom NetXtreme II Gigabit Ethernet Software* CD that comes with the server. To find updated information about configuring the controller, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Software and device drivers**.
4. Click **IBM System x3350** to display the matrix of downloadable device driver files for the server.

## Updating IBM Director

If you plan to use IBM Director to manage the server, you must check for the latest applicable IBM Director updates and interim fixes.

To install the IBM Director updates and any other applicable updates and interim fixes, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. the actual procedure might vary slightly from what is described in this document.

1. Check for the latest version of IBM Director.
   a. Go to http://www.ibm.com/systems/management/downloads.html.
   b. If the drop-down list shows a newer version of IBM Director than what comes with the server, follow the instructions on the Web page to download the latest version.
2. Install IBM Director.
3. Download and install any applicable updates or interim fixes for the server:
   a. Go to http://www.ibm.com/systems/support/.
   b. Under **Product Support**, click **System x**.
   c. Under **Popular links**, click **Software and device drivers**.
   d. Click **IBM System x3350** to display the matrix of downloadable files for the server.

## Setting up a Remote Supervisor Adapter II SlimLine

This section describes how to set up, cable, and configure a Remote Supervisor Adapter II SlimLine for use on an Advanced System Management (ASM) network so that you can manage the server remotely.

In addition to the information in this section, see the *IBM Remote Supervisor Adapter II User's Guide* on the IBM *System x Documentation* CD for information about how to configure and use an ASM network to manage the server remotely through the Web-based interface or the text-based interface.

**Note:** The Web-based interface and text-based interface do not support double-byte character set (DBCS) languages.

### Requirements

Make sure that you have completed the following procedures before you set up the Remote Supervisor Adapter II SlimLine:

- Install the operating system, using the ServerGuide program and the documentation that comes with the operating system.
- If you plan to use the remote disk function, install the following software:
  - On the server, install Microsoft Windows 2000 with Service Pack 3 or later.
  - On the client system, install Microsoft Windows 2000 or later and the Java 1.4 or later Plug-in.
- Make sure that the server has an Internet connection, so that you can download software and firmware from the IBM support Web site during the installation process.
- If you plan to configure Simple Network Management Protocol (SNMP) trap alerts on the Remote Supervisor Adapter II SlimLine, install and compile the management information base (MIB) on the SNMP manager. The Remote Supervisor Adapter II SlimLine firmware, the integrated service processor

firmware, and the MIB are available on the *ServerGuide Setup and Installation* CD and are fully functional. You can download the latest versions from http://www.ibm.com/systems/support/.

- If you plan to use the Web-based interface to access the Remote Supervisor Adapter II SlimLine remotely, install the Java 1.4 or later Plug-in and one of the following Web browsers on the client system:
  - Microsoft Internet Explorer version 5.5 with the latest Service Pack
  - Netscape Navigator version 7.0 or later
  - Mozilla version 1.3 or later

  The Web browser must be Java-enabled and must support JavaScript™.

## Cabling the Remote Supervisor Adapter II SlimLine

You can manage the server remotely through the Remote Supervisor Adapter II SlimLine by using one of the user interfaces and one of the connection methods that are described in the following table.

*Table 2. Cabling tasks to enable remote access to the Remote Supervisor Adapter II SlimLine*

| **User interface to Remote Supervisor Adapter II SlimLine** | **Connection to Remote Supervisor Adapter II SlimLine** |
|---|---|
| ASM Web-based interface using HTTP | LAN using the Ethernet connector |
| Text-based interface using Telnet | |

To cable the Remote Supervisor Adapter II SlimLine, complete the following steps:

1. Connect one end of a Category 3 or Category 5 Ethernet cable to the dedicated system-management Ethernet connector. See “Rear view” on page 7 for the location of the systems-management Ethernet connector.
2. Connect the other end of the connector to the network.
3. To make sure the network is working, check the Ethernet LEDs on rear of the server. See “Rear view” on page 7 for the location of the LEDs.

## Installing the Remote Supervisor Adapter II SlimLine firmware

The software and firmware files that you need are contained in one system service package installation kit. The kit contains the following files:

- Software and firmware installation instructions
- BIOS code update with support for the Remote Supervisor Adapter II SlimLine
- Diagnostics code update
- Remote Supervisor Adapter II SlimLine device drivers
- Remote Supervisor Adapter II SlimLine firmware update
- Integrated service processor firmware update
- Video device driver
- Firmware-update utility program

To download and install the software and firmware, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Software and device drivers**.

4. Click **System x3350** to display the matrix of downloadable files for the server.
5. Select the software or firmware package that you want to install. On the next page, click the link for each file that you want to download. Follow the instructions that are displayed.
6. Repeat step 5 until you have downloaded all the files that you need.
7. Follow the instructions in the Remote Supervisor Adapter II readme file that you downloaded, to install the software and firmware.
8. Restart the server after the software and firmware are installed.

## Completing the setup

See the *IBM Remote Supervisor Adapter II User's Guide* on the IBM *System x Documentation* CD for instructions for completing the configuration, including the following procedures:

- Configuring the Ethernet and serial ports
- Defining login IDs and passwords
- Selecting the events that will receive alert notifications
- Monitoring remote server status using the Remote Supervisor Adapter II SlimLine Web-based interface
- Controlling the server remotely
- Attaching a remote diskette drive, CD drive, or disk image to the server

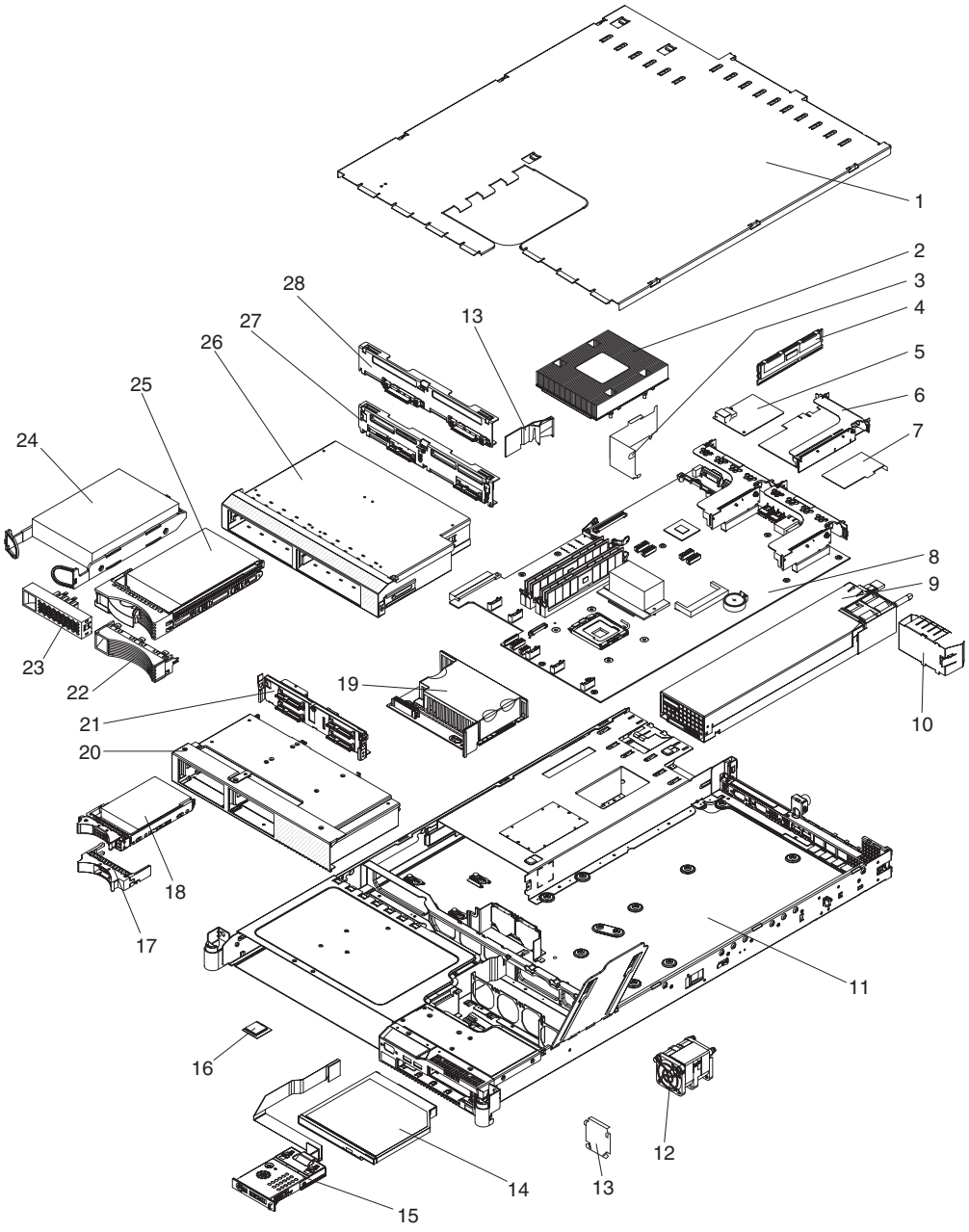
After you configure the adapter, use the Web-based interface to create a backup copy of the configuration so that you can restore the configuration if you have to replace the adapter. For more information, see the *Remote Supervisor Adapter II User's Guide*.

# Chapter 3. Parts listing, System x3350 Type 4192 and 4193 server

The following replaceable components are available for System x3350 Types 4192 and 4193 servers. For an updated parts listing on the Web, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. the actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/
2. Under **Product support** click **System x**.
3. Under **Popular links** click **Parts documents lookup**.
4. From the **Product family** menu, select **System x3350**, and click **Continue**.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## Replaceable server components

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** 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.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

*Table 3. Parts listing, Types 4192 and 4193*

| Index | Description | CRU part number (Tier 1) | CRU part number (Tier 2) | FRU part number |
|---|---|---|---|---|
| 1 | Top cover assembly | 44T2050 | | |
| 2 | Heat sink assembly | | | 39Y9423 |
| 3 | Baffle, air | 44E4046 | | |
| 4 | Memory, 512 MB PC2-5300 ECC | 41Y2725 | | |
| 4 | Memory, 1 GB PC2-5300 ECC | 41Y2728 | | |
| 4 | Memory, 2 GB PC2-5300 ECC (optional) | 41Y2854 | | |
| 5 | Mini-SAS/SATA controller | 43V7415 | | |
| 6 | PCI Express riser card | | 32R2883 | |
| 7 | ServeRAID-MR10i SAS/SATA controller (optional) | 43W4297 | | |
| 8 | System board | | | 43V7414 |
| 9 | AC power supply, 450 W | 39Y7196 | | |
| 10 | Power-supply filler panel | 39Y9420 | | |
| 11 | Chassis assembly | | | 39Y9522 |
| 12 | Fan assembly unit | 26K8083 | | |
| 13 | Air flow parts | 39Y9420 | | |
| 14 | CD-RW/DVD drive, 24/8x, HLDS | 39M3541 | | |
| 14 | CD-RW/DVD drive, 24/8x, Teac | 39M3563 | | |
| 14 | CD-RW/DVD drive, slim | 43W4585 | | |
| 15 | Operator information panel assembly | | | 43W0625 |
| 16 | Microprocessor, 2.33 GHz/1333MHz - 4MB, dual-core with heat sink (models 4192-32x, 4193-32x) | | | 43W4958 |
| 16 | Microprocessor, 2.66 GHz/1333 MHz - 4MB, dual-core with heat sink (models 4192-42x, 4192-44x, 4193-42x, 4193-44x) | | | 43W4959 |
| 16 | Microprocessor, 2.5 GHz/1333 MHz - 6MB, quad-core with heat sink (62x) | | | 44X0205 |
| 16 | Microprocessor, 2.66 GHz/1333 MHz - 12MB, quad-core with heat sink (72x) | | | 44X0206 |

*Table 3. Parts listing, Types 4192 and 4193 (continued)*

| Index | Description | CRU part number (Tier 1) | CRU part number (Tier 2) | FRU part number |
|---|---|---|---|---|
| 16 | Microprocessor, 2.83 GHz/1333 MHz - 12MB, quad-core with heat sink (82x) | | | 44X0207 |
| 16 | Microprocessor, 3.0 GHz/1333 MHz - 6MB, dual-core with heat sink (52x) | | | 44X0204 |
| 17 | Hot-swap filler panel, 2.5-inch | 26K8680 | | |
| 18 | Hard disk drive, 2.5-inch, hot-swap | varies | | |
| 19 | Power backplane | | 39Y6972 | |
| 20 | Hot-swap SAS hard disk drive cage, 2.5-inch | | 43V7469 | |
| 21 | Hot-swap SAS hard disk drive backplane, 2.5-inch | | 44W2728 | |
| 22 | Hot-swap filler panel, 3.5-inch | 39M4375 | | |
| 23 | Simple-swap filler panel, 3.5-inch | 39M4343 | | |
| 24 | Hard disk drive, 3.5-inch SATA, simple-swap | varies | | |
| 25 | Hard disk drive, 3.5-inch SAS/SATA, hot-swap | varies | | |
| 26 | Simple-swap disk drive cage, 3.5-inch | | 32R2823 | |
| 26 | Hot-swap disk drive cage, 3.5-inch | | 32R2821 | |
| 27 | Backplane, SAS/SATA, 3.5-inch, hot-swap | | 39M4349 | |
| 28 | Backplate, SATA, 3.5-inch, simple-swap | | 39M4347 | |
| | Miscellaneous parts kit | | 26K8080 | |
| | Cable, signal, mini-SAS controller | | 41Y3884 | |
| | Cable, signal, SATA (simple-swap models) | | 39M6276 | |
| | Cable, power, 3.5-inch, SAS | | 26K8068 | |
| | Cable, power, 2.5-inch SAS | | 43V7421 | |
| | Cable, SAS signal | | 41Y3884 | |
| | Cable, power, 3.5-inch, SATA/simple-swap | | 44E4064 | |
| | Cable, RAID, 3.5-inch (simple-swap models) | 43V7423 | | |
| | Cable, front panel USB | | 26K8058 | |
| | Cable, 6 inch video (optional) | 39Y9493 | | |
| | Cable, 6 inch serial (optional) | 39Y9495 | | |
| | Power cable, rack | 39M5377 | | |
| | Power cord, AC | 39M5081 | | |
| | Y power cord, AC (optional) | 39M5450 | | |
| | CD-RW/DVD blank filler (optional) | 41Y8740 | | |
| | CD-RW/DVD drive interposer card | 42C3983 | | |
| | Cable management arm assembly, 1U | | | 39Y9530 |
| | Kit, 450 W power supply (optional) | 43V7477 | | |
| | Slide kit | 39Y9510 | | |
| | Battery, system board, 3.0 V | 33F8354 | | |
| | Service label, system (All 3.5-inch and 2.5-inch SAS models) | 44E4048 | | |

*Table 3. Parts listing, Types 4192 and 4193 (continued)*

| Index | Description | CRU part number (Tier 1) | CRU part number (Tier 2) | FRU part number |
|---|---|---|---|---|
| | Service labels, SAS, SATA, right fan door | 44T2139 | | |
| | Label, CRU/FRU listing | 43V7419 | | |
| | Remote Supervisor Adapter II SlimLine (optional) | 44T1412 | | |
| | Low-profile adapter | varies | | |
| | Kit, thermal grease | | | 41Y9292 |
| | Bezel, Media | | 43V7428 | |
| | Card, SAS | 25R8071 | | |
| | Card, SAS | 39R8852 | | |
| | Card, Carrier/Daughter | 43W4304 | | |

## 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.

| IBM power cord part number | Used in these countries and regions |
|---|---|
| 39M5206 | China |
| 39M5102 | Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea |

| IBM power cord part number | Used in these countries and regions |
|---|---|
| 39M5123 | 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 |
| 39M5130 | Denmark |
| 39M5144 | Bangladesh, Lesotho, Macao, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda |
| 39M5151 | 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 |
| 39M5158 | Liechtenstein, Switzerland |
| 39M5165 | Chile, Italy, Libyan Arab Jamahiriya |
| 39M5172 | Israel |
| 39M5095 | 220 - 240 V<br>Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, 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 |
| 39M5081 | 110 - 120 V<br>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 |
| 39M5219 | Korea (Democratic People's Republic of), Korea (Republic of) |
| 39M5199 | Japan |

| IBM power cord part number | Used in these countries and regions |
|---|---|
| 39M5068 | Argentina, Paraguay, Uruguay |
| 39M5226 | India |
| 39M5233 | Brazil |

# Chapter 4. Removing and replacing server components

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** 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.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

See Chapter 3, “Parts listing, System x3350 Type 4192 and 4193 server,” on page 45 to determine whether a component is a Tier 1 CRU, Tier 2 CRU, or FRU.

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

## Installation guidelines

Before you install optional devices, read the following information:

- Read the safety information that begins on pagevii, “Working inside the server with the power on” on page 55, and the guidelines in “Handling static-sensitive devices” on page 55. This information will help you work safely.
- When you install your new server, take the opportunity to download and apply the most recent firmware updates. This step will help to ensure that any known issues are addressed and that your server is ready to function at maximum levels of performance. To download firmware updates for your server, complete the following steps.

  **Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

  1. Go to http://www.ibm.com/systems/support/.
  2. Under **Product support**, click **System x**.
  3. Under **Popular links**, click **Software and device drivers**.
  4. Click **System x3350** to display the matrix of downloadable files for the server.

  For additional information about tools for updating, managing, and deploying firmware, see the System x and xSeries Tools Center at http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp
- Before you install optional hardware devices, make sure that the server is working correctly. Start the server, and make sure that the operating system starts, if an operating system is installed. If the server is not working correctly, see Chapter 5, “Diagnostics,” on page 111 for diagnostic information.
- 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 and a small Phillips 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. However, you must turnoff the server before you perform any steps that involve removing or installing adapter cables or non-hot-swap optional devices or components.
- 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 optional devices for the server, see http://www.ibm.com/servers/eserver/serverproven/compat/us/.

## System reliability guidelines

To help ensure proper cooling and system reliability, make sure that the following requirements are met:

- 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 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 you turn on the server. Operating the server for extended periods of time (more than 30 minutes) with the server cover removed might damage server components.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan within 48 hours.
- You have replaced a hot-swap drive within 2 minutes of removal.
- You do not operate the server without the air baffles installed. Operating the server without the air baffles might cause the microprocessor to overheat.
- For redundant operation, the power supplies are connected to 200 - 240 V ac.

## 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 might result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when you work 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 you work 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 you work 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 surface 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 you handle 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 all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Connecting the cables

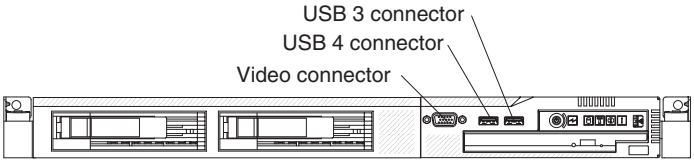
You must turn off the server before you connect any cables to or disconnect any cable from the server.

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

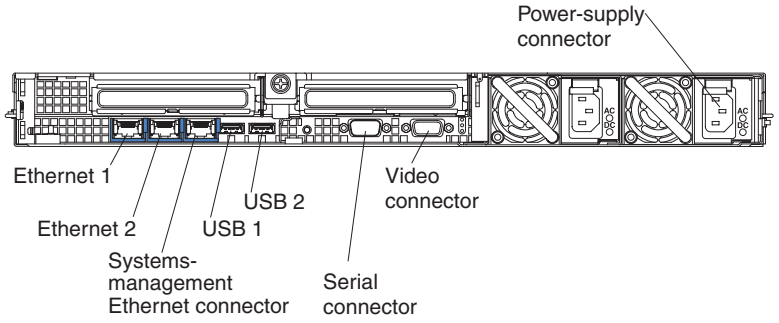
For details about the locations and functions of the input/output connectors, see “Server controls, LEDs, and connectors” on page 5.

The following illustrations show the locations of the input/output connectors. Detailed cabling instructions for installing the server in a rack are in the *Rack Installation Instructions* that come with the server.

**Front View**




**Rear View**



## Removing and replacing Tier 1 CRUs

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

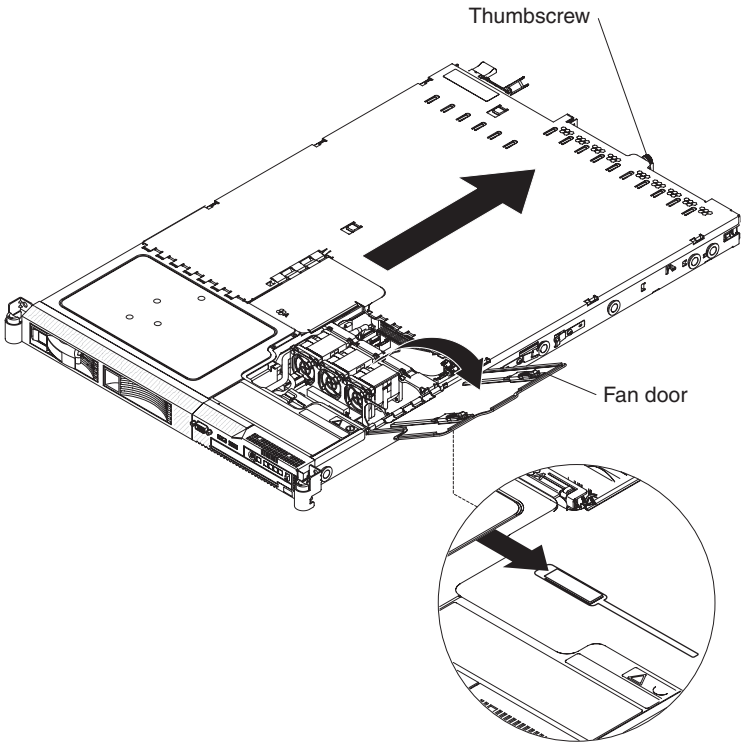
The illustrations in this document might differ slightly from your hardware.

## Removing the cover

To remove the server cover, complete the following steps.

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. If you are planning to install or remove a microprocessor, memory module, PCI adapter, battery, or other non-hot-swap optional device, turn off the server and all attached devices and disconnect all external cables and power cords.
3. Press down on the left and right side latches and pull the server out of the rack enclosure until both slide rails lock.

   **Note:** You can reach the cables on the back of the server when the server is in the locked position.
4. Loosen the thumbscrew that secures the cover at the back of the server.
5. Slide the two fan cover-release latches on the top of the fan door to the right; then, open the fan door.



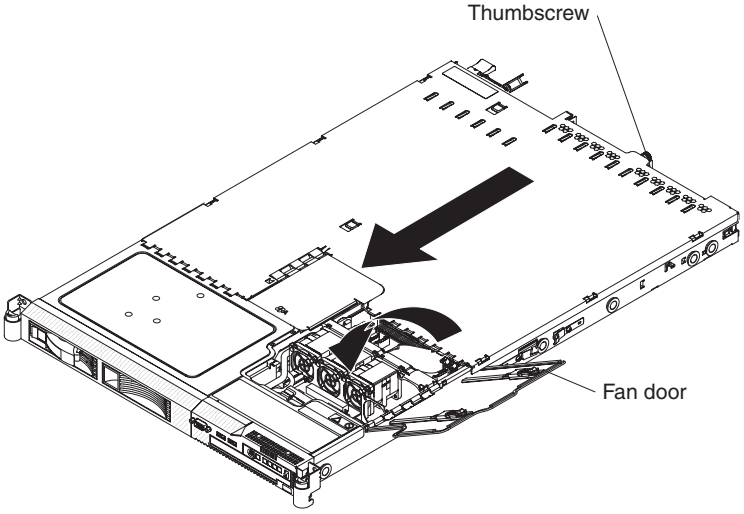

6. Slide the server cover back until the locking tabs release.
7. Lift the server cover off the server and set the cover aside.

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

## Installing the cover

To install the server cover, complete the following steps:

1. Position the cover on top of the server and open the fan door.
2. Slide the cover forward, making sure that all the tabs on the front, rear, and side of the cover engage the chassis correctly.
3. Close the fan door and slide the fan cover release latches to the right to lock the cover in place.
4. Tighten the thumbscrew until the cover correctly engages all the inset tabs on the server.

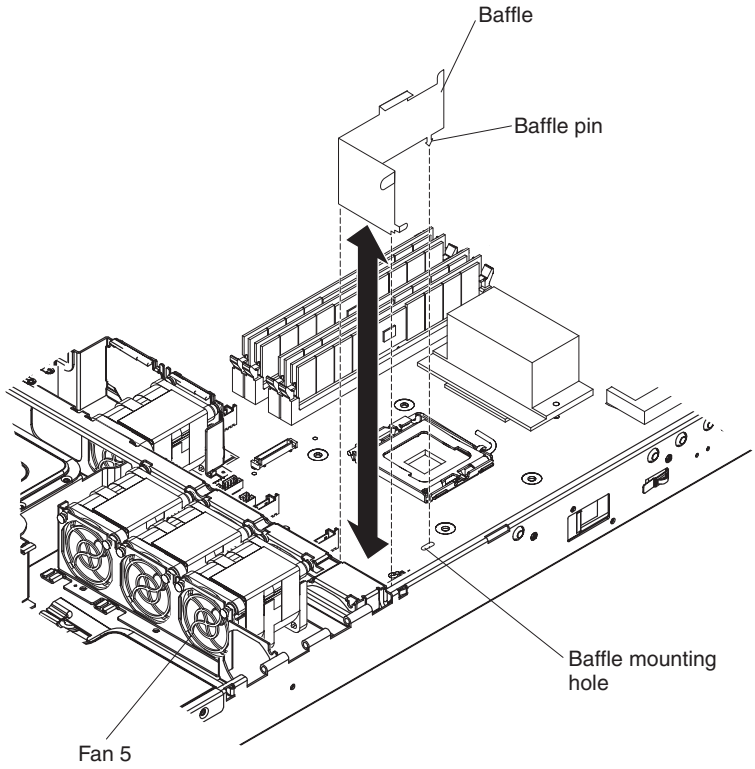



5. Slide the server into the rack.

## Removing the side air baffle

To remove the air baffle that is closest to the wall of the server, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. Lift fan 5 out of the fan bracket.



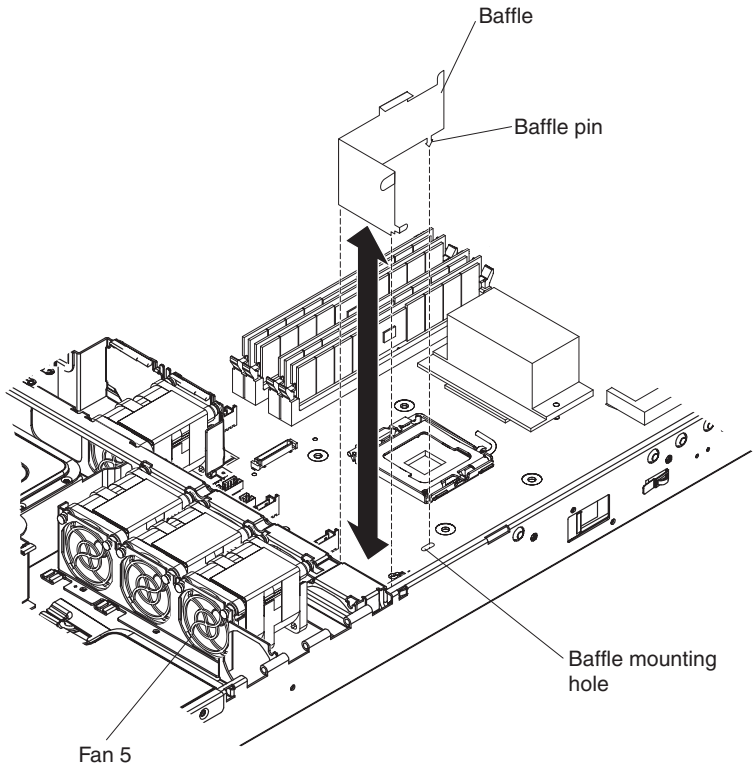

5. Lift the baffle out of the server.
6. If you are instructed to return the baffles, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

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

## Installing the side air baffle

To install the replacement air baffle that is closest to the side of the server, complete the following steps:

1. Position the front of the baffle against the bulkhead.

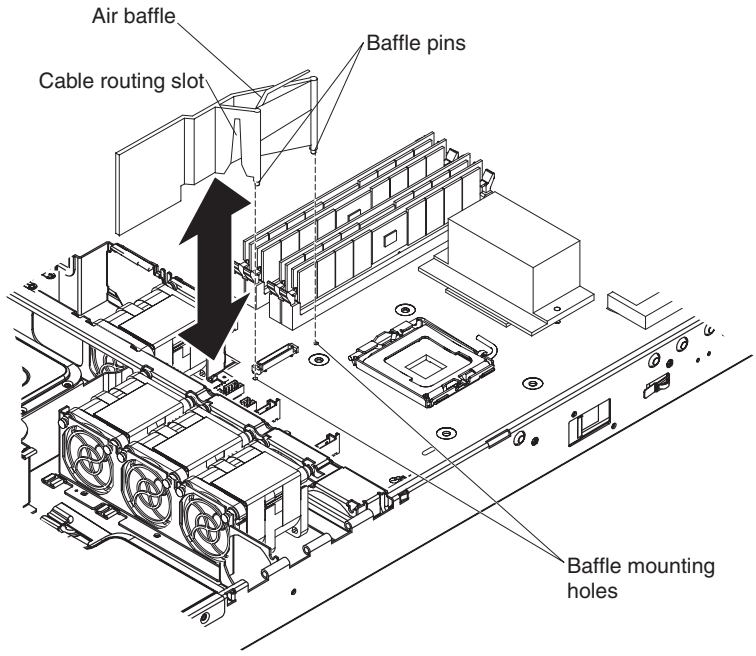



2. Insert the pin on the baffle into the mounting hole on the system board.
3. Press down on the baffle until the pin seats in the system board.
4. Install fan 5 in the fan bracket.
5. Install the cover (see “Installing the cover” on page 58).
6. Slide the server into the rack.
7. Reconnect the external cables and the power cords.
8. Turn on the peripheral devices and the server.

## Removing the center air baffle

To remove the air baffle near the center of the server, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables.
3. Remove the cover (see “Removing the cover” on page 57).



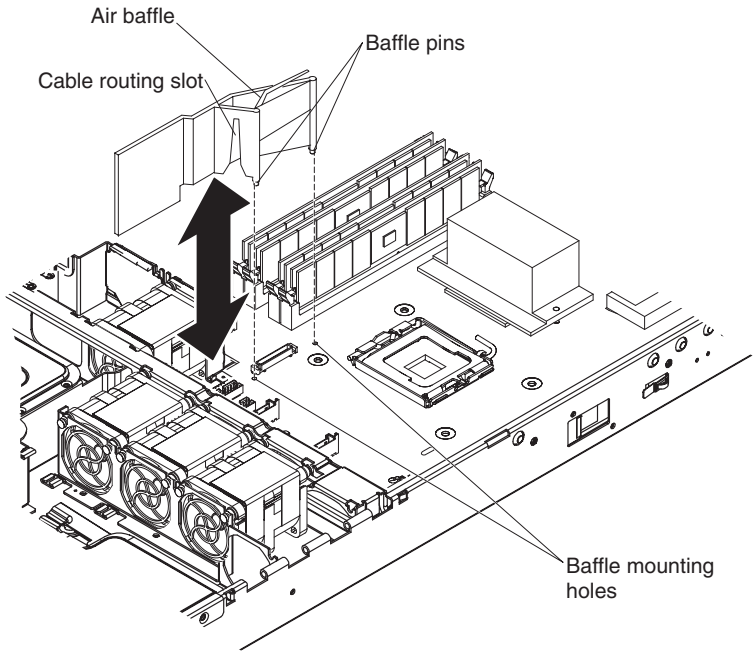

4. Lift the baffle up slightly, making sure that the pins come out of the holes on the system board.
5. Slide the cable out of the cable routing slot. Make sure that you do not disconnect or loosen the cable.
6. Lift the baffle out of the server.
7. If you are instructed to return the baffle, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

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

## Installing the center air baffle

To install the replacement air baffle that is near the center of the server, complete the following steps:

1. Align the pins on the bottom of the baffle with the mounting holes in the system board.
2. Slide the operator panel and the media backplane cables into the cable routing slot.

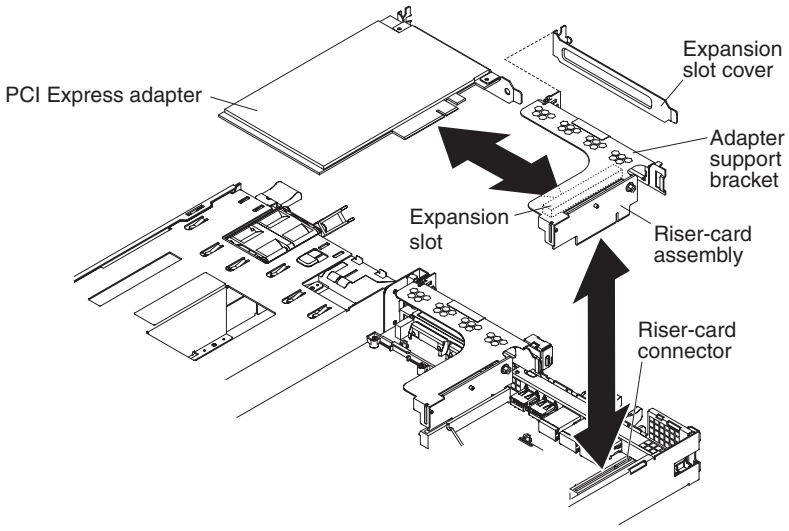



3. Press down on the baffle, making sure that the cables are not pinched beneath it, until the pins seat in the system board.
4. Install the cover (see “Installing the cover” on page 58).
5. Slide the server into the rack.
6. Reconnect the external cables and the power cords.
7. Turn on the peripheral devices and the server.

## Removing a riser-card assembly

To remove a riser-card assembly, complete the following step:.

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. If an adapter is installed in the riser-card assembly, disconnect any cables that are connected to the adapter.

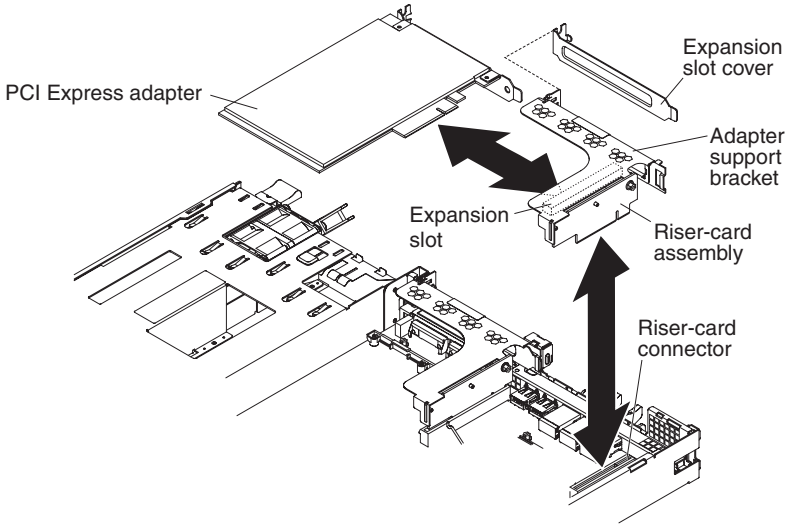



5. Grasp the riser-card assembly at the rear edge and lift to remove it.
6. If there is an adapter in the riser-card assembly, remove it.
7. If you are instructed to return the riser-card assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a riser-card assembly

To install the replacement riser-card assembly, complete the following step:.

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Install the adapter, if one is present. See “Installing an adapter” on page 65.

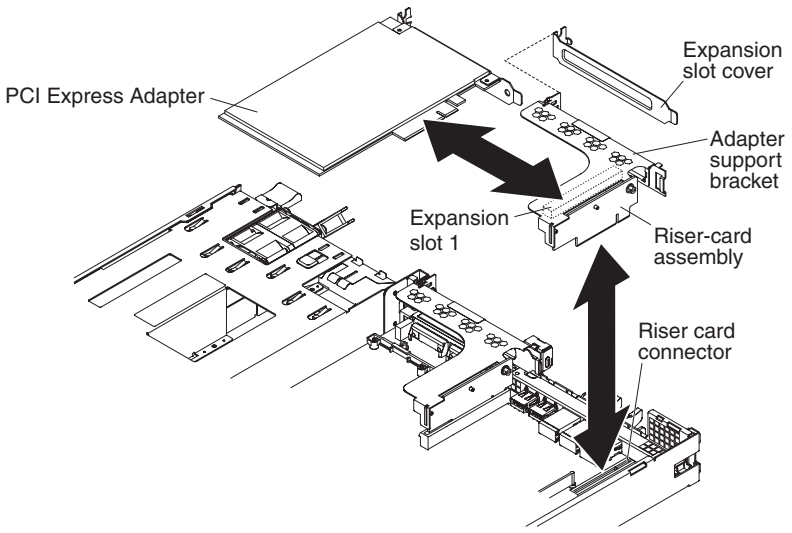



3. Insert the riser-card assembly into the connector on the system board. Push down firmly on the riser-card assembly to make sure that it is fully seated.
4. Install the cover (see “Installing the cover” on page 58).
5. Slide the server into the rack.
6. Reconnect the external cables and the power cords.
7. Turn on the peripheral devices and the server.

## Removing an adapter

To remove a PCI Express adapter, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. Disconnect any cables from the adapter.

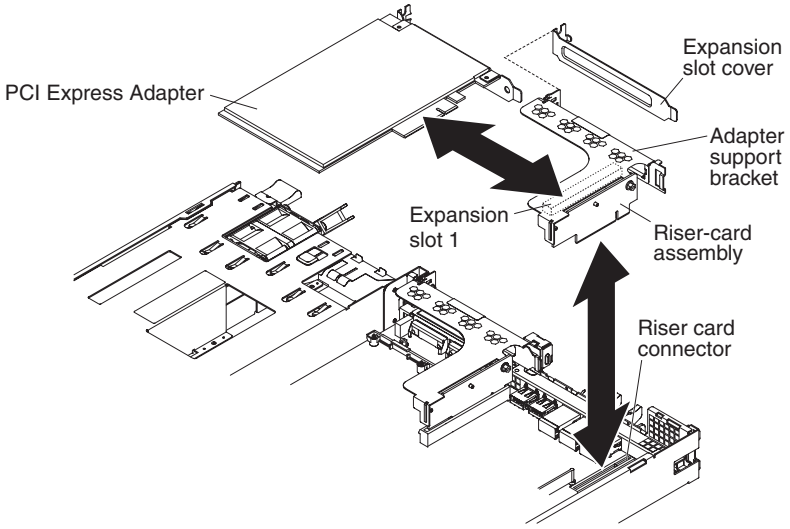



5. Grasp the riser-card assembly at the rear edge and lift to remove the riser-card assembly.
6. Place the riser-card assembly on a flat, static-protective surface.
7. Carefully grasp the adapter by its top edge or upper corners, and pull the adapter from the riser-card assembly.
8. If you are instructed to return the adapter, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing an adapter

To install the replacement adapter, complete the following steps.

1. Route the adapter cables, if any, before you install the adapter. Route the cables so that they are not on top of components or blocking the airflow from the fans.
2. Touch the static-protective package that contains the adapter to any unpainted metal surface on the server. Then, remove the adapter from the static-protective package and set any jumpers or switches on the adapter as directed by the adapter manufacturer.

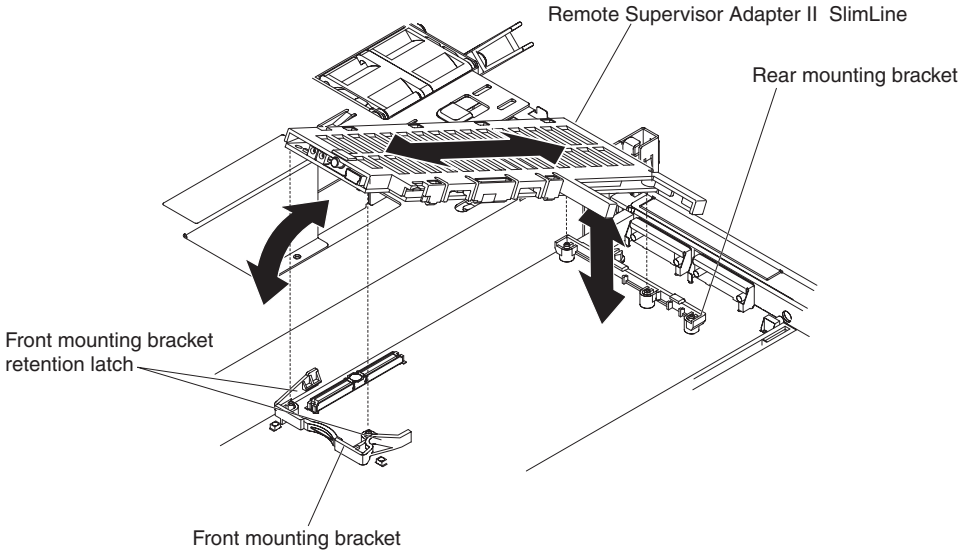



3. Insert the adapter into the riser-card assembly, aligning the connector on the adapter with the connector on the riser-card assembly. Press the adapter connector *firmly* into the riser-card connector. Make sure that the adapter snaps securely into the riser-card assembly.
4. Insert the riser-card assembly into the riser-card connector on the system board. Then, press down on the assembly. Make sure that the riser-card assembly is fully seated in the riser-card connector on the system board.
5. Connect the cables to the adapter.
6. Perform any configuration tasks that are required for the adapter.
7. Install the cover (see “Installing the cover” on page 58).
8. Slide the server into the rack.
9. Reconnect the external cables and the power cords.
10. Turn on the peripheral devices and the server.

## Removing a Remote Supervisor Adapter II SlimLine

To remove a Remote Supervisor Adapter II SlimLine, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. If an adapter is installed in the riser-card assembly in slot 2, remove the riser-card assembly (see “Removing a riser-card assembly” on page 62).

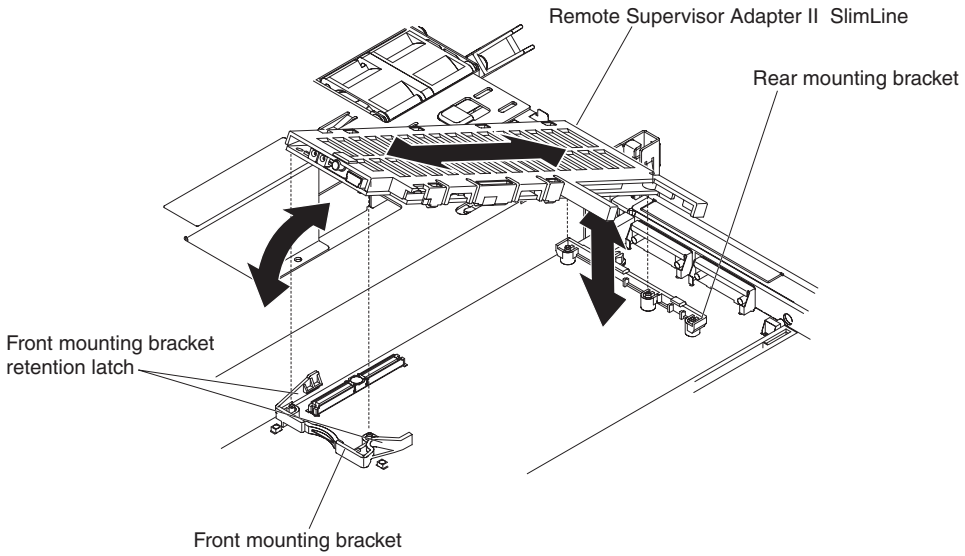



5. Spread the front mounting bracket retention latches as you lift the Remote Supervisor Adapter II SlimLine, to disconnect it from the system board; then, lift it out of the server.
6. If you are instructed to return the Remote Supervisor Adapter II SlimLine, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a Remote Supervisor Adapter II SlimLine

To install a replacement Remote Supervisor Adapter II SlimLine, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Position the Remote Supervisor Adapter II SlimLine so that the connector on the adapter aligns with the connector on the system board.




3. At a downward angle, slip the back end of the adapter under the tab on the rear mounting bracket, aligning the holes in the adapter with the posts on the rear mounting bracket. Rotate the connector end of the adapter down into the front mounting bracket, aligning the holes in the adapter with the posts on the front mounting bracket.
4. Press the Remote Supervisor Adapter II SlimLine firmly into the connector and make sure that all tabs on both mounting brackets secure the adapter in place.

   **Attention:** Incomplete insertion might cause damage to the server or the adapter.
5. If you removed the riser-card assembly, install it in slot 2 on the system board (see “Installing a riser-card assembly” on page 63).
6. Install the cover (see “Installing the cover” on page 58.
7. Slide the server into the rack.
8. Reconnect the external cables and the power cords.
9. Turn on the peripheral devices and the server.

See the documentation that comes with the Remote Supervisor Adapter II SlimLine for information about installing the firmware and configuring the adapter. Create a backup copy of the configuration so that you can restore the configuration if you have to replace the adapter in the future.

**Note:** When you start the server for the first time after you install a Remote Supervisor Adapter II SlimLine, the startup process will take several minutes longer than a typical startup.

# Removing and installing internal drives

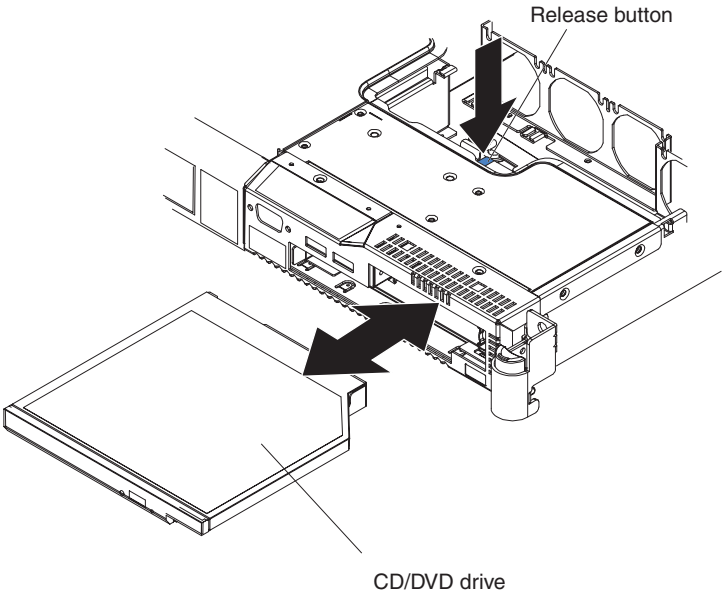
This section describes the removal and installation of internal drives. See the *User's Guide* for more information about the types of drives that the server supports and other information that you must consider when you install internal drives.

**Attention:** To avoid damage to the hard disk drive connectors, make sure that the server cover is in place and fully closed whenever you install or remove a hard disk drive.

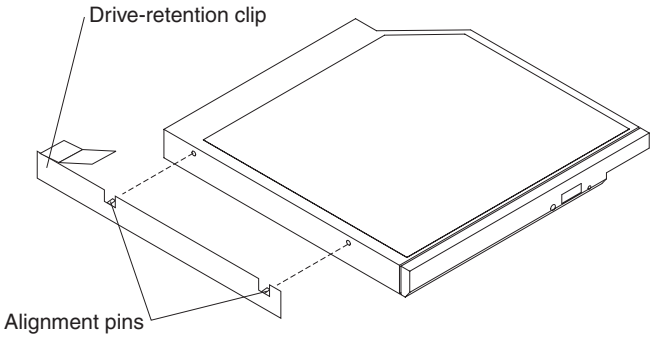
## Removing a CD-RW/DVD drive

To remove the CD-RW/DVD drive, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Turn off the server and peripheral devices and disconnect the power cords and all external cables.
3. Slide the server forward to gain access to the fan door.
4. Open the fan door.
5. Press the release tab down to release the drive; then, while you press the tab, push the drive toward the front of the server.




6. Pull the drive out of the front of the server.
7. Remove the retention clip from the side of the drive. Save the clip to use when you install the replacement drive.

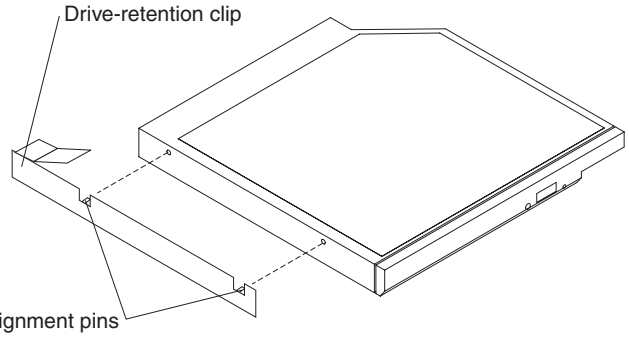


8. If you are instructed to return the CD-RW/DVD drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the CD-RW/DVD drive

To install the replacement CD-RW/DVD drive, complete the following steps:

1. Read the safety information that begins on vii and “Installation guidelines” on page 53
2. Follow the instructions that come with the new drive to set any jumpers or switches.
3. Attach the drive-retention clip to the side of the drive.



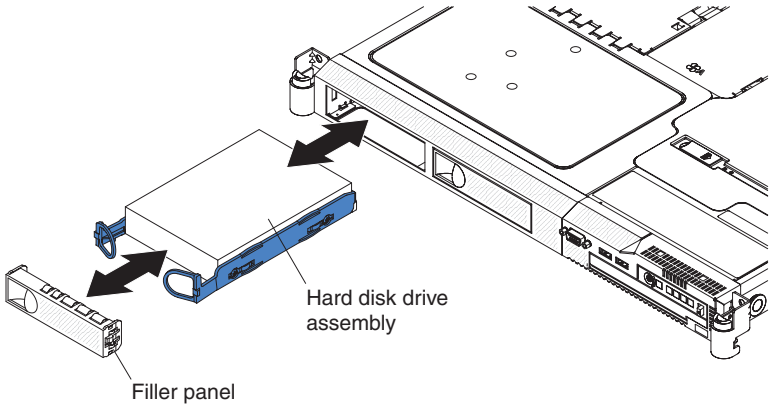

4. Slide the drive into the CD-RW/DVD drive bay until the drive clicks into place.
5. Close the fan door.
6. Slide the server into the rack.
7. Reconnect the external cables and the power cords.
8. Turn on the peripheral devices and the server.

## Removing a simple-swap SATA hard disk drive

Locate the documentation that comes with the hard disk drive and follow those instructions in addition to the instructions in this section.

**Attention:** Simple-swap hard disk drives are not hot-swappable. Disconnect all power from the server before you remove or install a simple-swap hard disk drive.

To remove a simple-swap SATA hard disk drive, complete the following steps.




**Attention:** To avoid damage to the hard disk drive connectors, make sure that the server cover is in place and fully closed whenever you install or remove a hard disk drive.

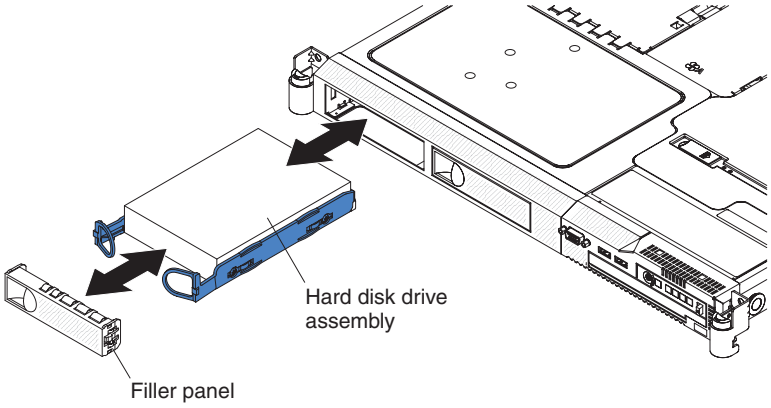
1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect the power cord and all external cables.
3. Remove the filler panel from the bay.

   **Note:** To ensure that there is adequate system cooling, do not operate the server for more than 2 minutes without either a hard disk drive or a filler panel installed in each bay.
4. Pull the loops of the drive tray toward each other and pull the tray out of the bay.
5. If you are instructed to return the simple-swap hard disk drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a simple-swap hard disk drive

To install the replacement simple-swap SATA hard disk drive, complete the following steps.

**Note:** If you have only one hard disk drive, install it in the left drive bay.




**Attention:** To avoid damage to the hard disk drive connectors, make sure that the server cover is in place and fully closed whenever you install or remove a hard disk drive.

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Pull the loops of the drive tray toward each other, and slide the drive into the server until the drive connects to the backplate.
3. Release the loops of the drive tray.
4. Insert the filler panel into the bay to cover the drive.

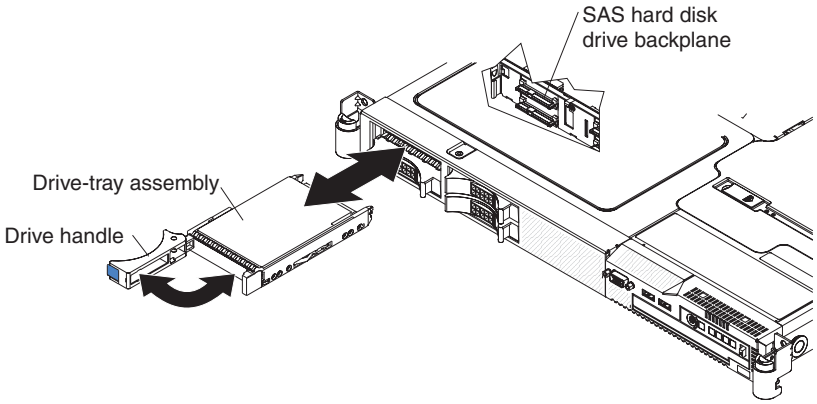
**Note:** If the server has a RAID controller or adapter, you might have to reconfigure the disk arrays after you install hard disk drives. See the RAID documentation on the IBM *System x Documentation* CD for information about RAID adapters.

## Removing a hot-swap hard disk drive

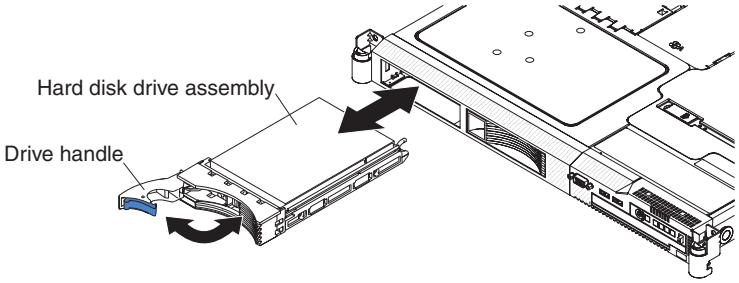
To remove a 2.5-inch SAS or 3.5-inch SAS/SATA hot-swap hard disk drive, complete the following steps.

**Attention:** To avoid damage to the hard disk drive connectors, make sure that the server cover is in place and fully closed whenever you install or remove a hard disk drive.

The following illustration show the 2.5-inch hard disk drive server model.




The following illustration shows the 3.5-inch hard disk drive server model.




1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Move the handle on the drive to the open position (perpendicular to the drive).
3. Pull the hot-swap drive assembly from the bay.

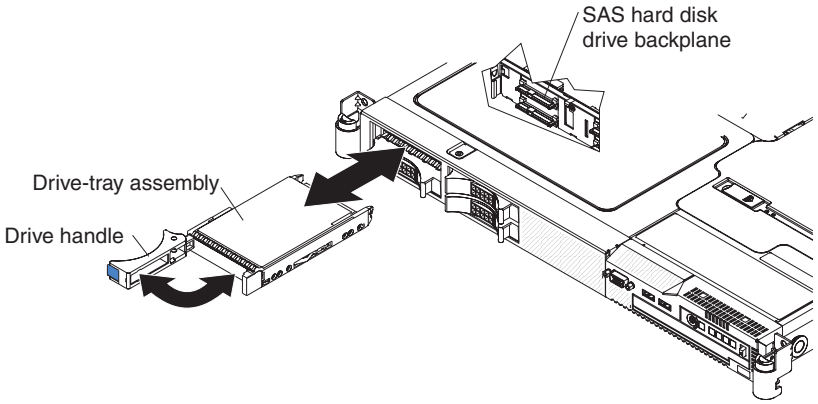
   **Note:** To make sure that there is adequate system cooling, do not operate the server for more than 2 minutes without either a hard disk drive or a filler panel installed in each bay.
4. If you are instructed to return the hot-swap hard disk drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a hot-swap hard disk drive

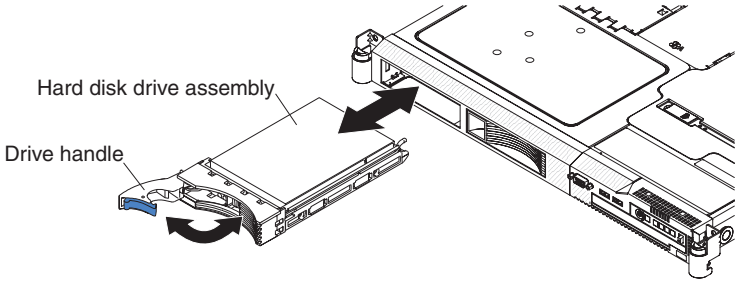
To install the replacement 2.5-inch SAS or 3.5-inch SAS/SATA hot-swap hard disk drive, complete the following steps.

**Note:** If you have only one hard disk drive, install it in the left or upper-left drive bay.

The following illustration show the 2.5-inch hard disk drive server model.




The following illustration shows the 3.5-inch hard disk drive server model.



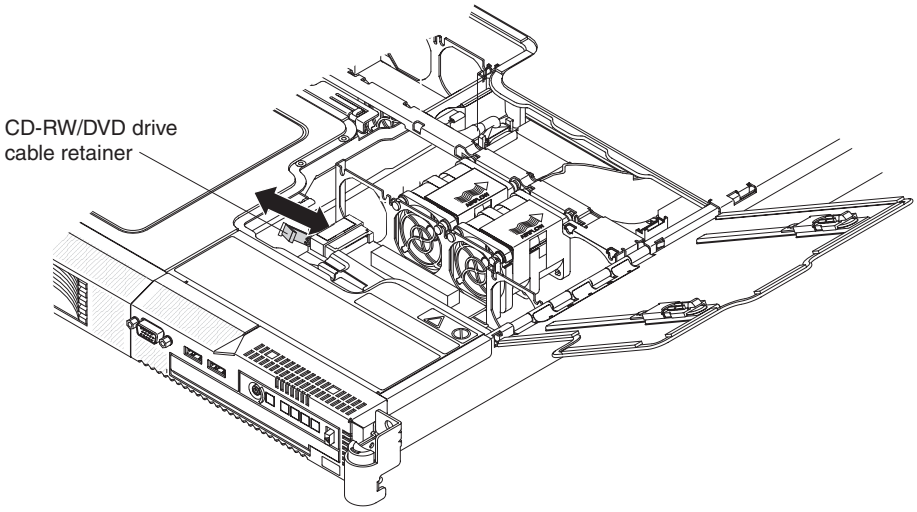

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Place the drive handle in the open position (perpendicular to the drive).
3. Align the drive assembly with the guide rails in the bay.
4. Gently push the drive assembly into the bay until the drive stops.
5. Push the tray handle to the closed (locked) position.
6. Check the hard disk drive status LED and activity LED to verify that the drive is operating correctly.

**Note:** If the server has a RAID controller or adapter, you might have to reconfigure the disk arrays after you install hard disk drives. See the RAID documentation on the IBM *System x Documentation* CD for information about RAID adapters.

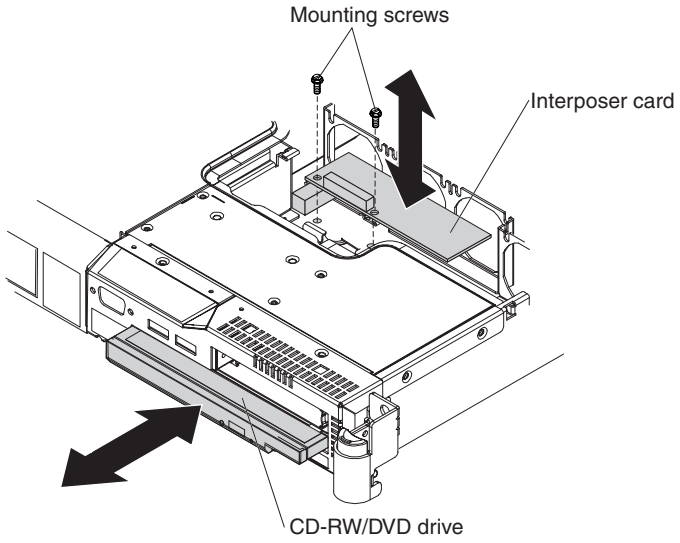
## Removing the CD-RW/DVD drive interposer card

To remove the CD-RW/DVD drive interposer card complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect the power cords and all external cables.
3. Open the fan door.
4. Remove the CD-RW/DVD drive (see “Removing a CD-RW/DVD drive” on page 68).




5. Slide the CD-RW/DVD drive cable retainer away from the interposer card.

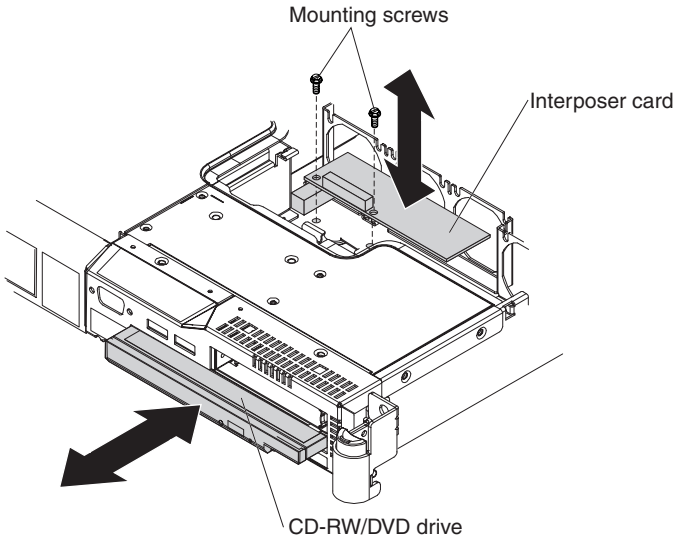



6. Remove the two mounting screws from the interposer card and disconnect the CD-RW/DVD drive cable; then, remove the interposer card.
7. If you are instructed to return the CD-RW/DVD interposer card, follow all packaging instructions and use any packaging materials for shipping that are supplied to you.

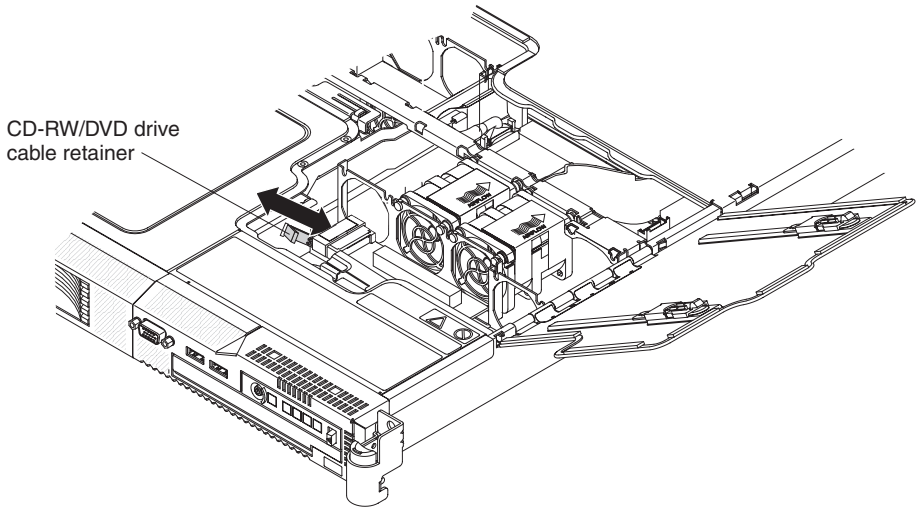
## Installing the CD-RW/DVD drive interposer card

To install the replacement CD-RW/DVD drive interposer card, complete the following steps:

1. Connect the CD-RW/DVD drive cable to the interposer card.




2. Position the interposer card in the server and attach it with the two mounting screws that you removed previously
3. Slide the CD-RW/DVD drive cable retainer toward the interposer card, so that it locks the CD-RW/DVD connector in place against the card.



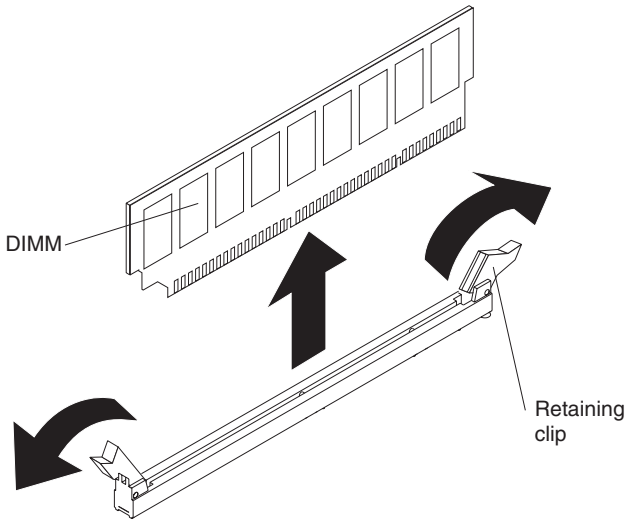

4. Install the CD-RW/DVD drive (see “Installing the CD-RW/DVD drive” on page 69).
5. Close the fan door.
6. Slide the server into the rack.
7. Reconnect the power cords and any cables that were removed.
8. Turn on the peripheral devices and the server.

## Removing a memory module (DIMM)

To remove a DIMM, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect the power cord and all external cables.

3. Remove the cover (see “Removing the cover” on page 57).




4. Open the retaining clip on each end of the DIMM connector.

   **Attention:** To avoid breaking the retaining clips or damaging the DIMM connectors, open and close the clips gently.
5. Lift the DIMM out of the connector.
6. If you are instructed to return the DIMM, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a memory module (DIMM)

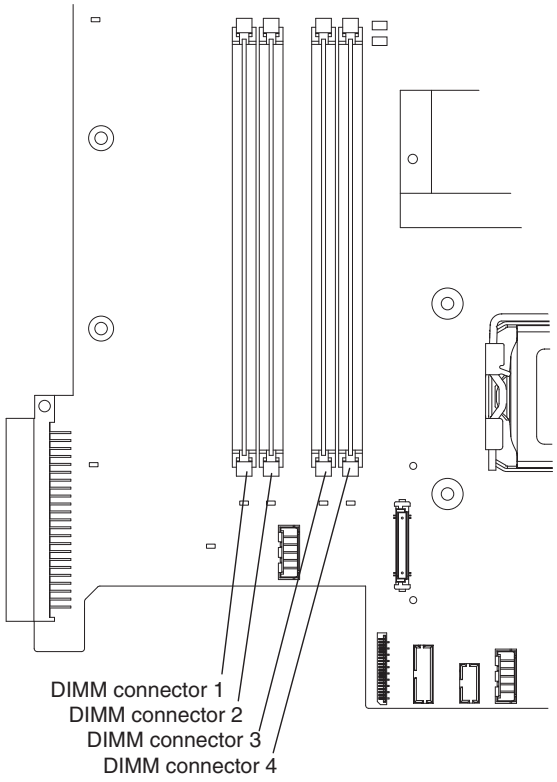
The following notes describe the types of dual inline memory modules (DIMMs) that the server supports and other information that you must consider when you install DIMMs:

- The server supports up to four DIMMs for system memory. See http://www.ibm.com/servers/eserver/serverproven/compat/us/ for a list of memory modules that you can use with the server.

  **Note:** Because some memory is reserved for system operation, the actual usable memory size that is reported by the operating system is less than the total installed size.
- The server comes with a minimum of two 512 MB DIMMs or two 1 GB DIMMs, installed in connectors 1 and 3. When you install additional DIMMs, you must install two identical DIMMs at a time, in the order shown in the following table, to maintain performance.

*Table 4. DIMM installation sequence*

| DIMMs | DIMM connectors |
|---|---|
| 2 DIMMs | 1 and 3 |
| 4 DIMMs | 1, 3, 2, 4 |




- Each DIMM in a pair must be the same size, speed, type, and technology to ensure that the server will operate correctly.
- If you install a second pair of DIMMs in the DIMM 2 and DIMM 4 connectors, they do not have to be the same size, speed, type, and technology as the DIMMs in the DIMM 1 and DIMM 3 connectors. However, the size, speed, type, and technology of the DIMMs that you install in the DIMM 2 and DIMM 4 connectors must match each other.
- The server can operate in single channel mode or dual channel mode.
- DIMM population is based on single-rank, double-rank, or mix single-rank and double-rank DIMMs. DIMMs must be installed in order, starting with the DIMM connector that is farthest from the memory controller hub. Double-rank DIMMs must be installed in the DIMM connector that is farthest from the memory controller hub when you install a combination of single-rank and double-rank DIMMs. The following tables show examples of populating the server with different combinations of single-rank and double-rank DIMMs.

*Table 5. Interleave Mode DIMM slot population*

| **First pair** | | **Second pair** | | **Remarks** |
|---|---|---|---|---|
| DIMM 1 | DIMM 3 | DIMM 2 | DIMM 4 | |
| Single-rank | Single-rank | Single-rank | Single-rank | |
| Single-rank | Single-rank | Double-rank | Double-rank | Recommend this configuration as the first choice. |
| Double-rank | Double-rank | Single-rank | Single-rank | Recommend this configuration as the second choice. |

*Table 5. Interleave Mode DIMM slot population (continued)*

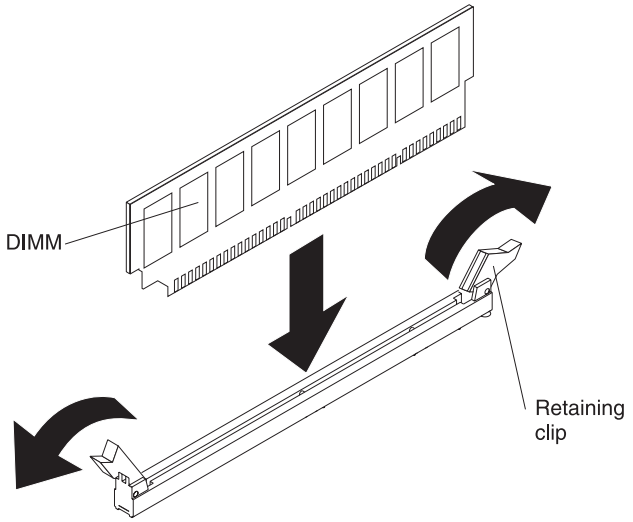
| First pair | | Second pair | | Remarks |
|---|---|---|---|---|
| Double-rank | Double-rank | Double-rank | Double-rank | |

- When you install or remove DIMMs, the server configuration information changes. When you restart the server, the system displays a message that indicates that the memory configuration has changed.

To install the replacement DIMM, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Open the retaining clip on each end of the DIMM connector.

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



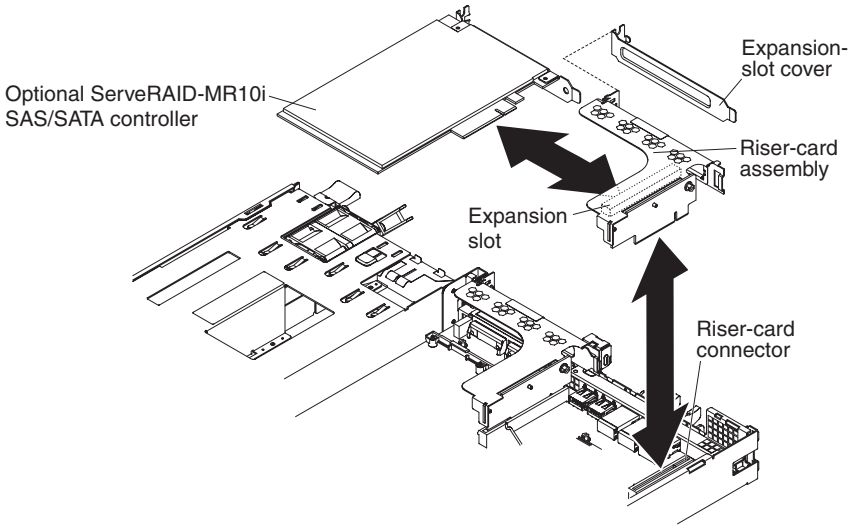

3. Touch the static-protective package that contains the DIMM to any unpainted metal surface on the outside of the server; then, remove the DIMM from the package.
4. Turn the DIMM so that the DIMM keys align correctly with the connector.
5. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector.
6. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is firmly seated in the connector.

   **Note:** 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.
7. Install the cover (see “Installing the cover” on page 58).
8. Slide the server into the rack.
9. Reconnect the external cables and the power cords.
10. Turn on the peripheral devices and the server.

## Removing an optional ServeRAID-MR10i SAS/SATA controller

To remove an optional ServeRAID-MR10i SAS/SATA controller, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect the power cord and all external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. Disconnect the hard disk drive signal cable from the connector (J8) on the controller.



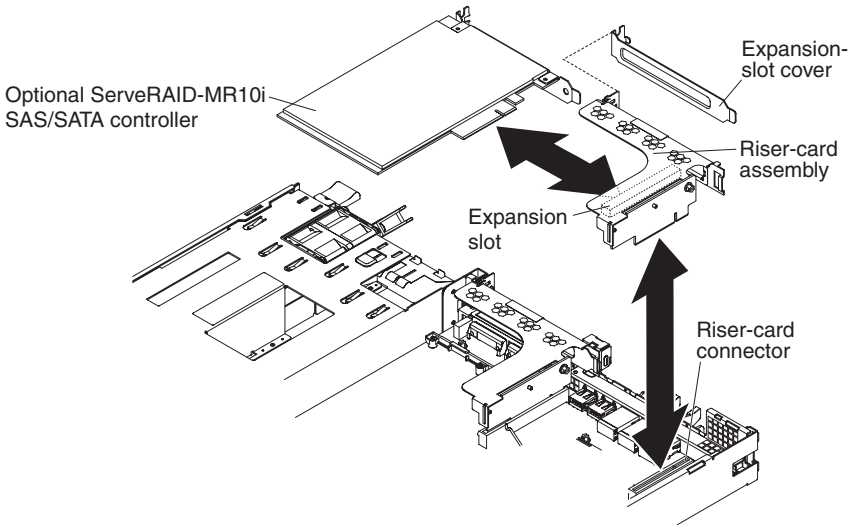

5. Grasp the riser-card assembly at the rear edge, and lift to remove it from the server. Place the riser-card assembly on a flat, static-protective surface.
6. Carefully grasp the controller by its top edge or upper corners, and pull the controller from the riser-card assembly.
7. If you are instructed to return the controller, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing an optional ServeRAID-MR10i SAS/SATA controller

For a list of supported optional devices for the server, see http://www.ibm.com/servers/eserver/serverproven/compat/us/

To install a replacement ServeRAID-MR10i SAS/SATA controller, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Touch the static-protective package that contains the controller to any unpainted metal surface on the server. Then, remove the controller from the static-protective package. Avoid touching the components and gold-edge connectors on the controller.




3. Insert the controller into the riser-card assembly, aligning the connector on the controller with the connector on the riser-card assembly. Press the controller *firmly* into the riser-card assembly. Make sure that the controller snaps securely into the riser-card assembly.
4. Insert the riser-card assembly into the riser-card connector on the system board. Then, press down on the assembly. Make sure that the riser-card assembly is fully seated in the riser-card connector on the system board.
5. Connect the hard disk drive signal cable to connector J8 on the ServeRAID-MR10i controller in the riser-card assembly.
6. Install the cover.
7. Slide the server into the rack.
8. Reconnect the external cables and the power cords.
9. Turn on the peripheral devices and the server.

## Removing a power supply

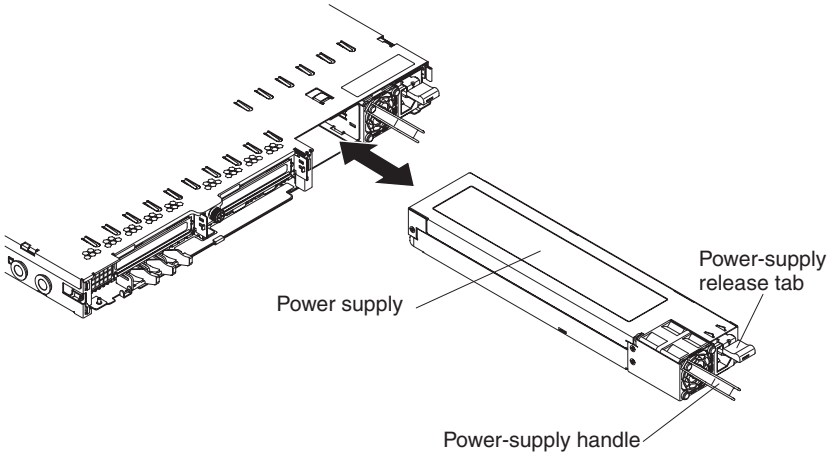
**Statement 8:**

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

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

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

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. If only one power supply is installed, turn off the server and peripheral devices and disconnect all power cords.
3. If the server is in a rack, at the back of the server, pull back the cable management arm to gain access to the rear of the server and the power supply.




4. Disconnect the power cord from the power supply.
5. Press and hold the orange release tab down and pull the power supply out of the server.
6. If you are instructed to return the power supply, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a power supply

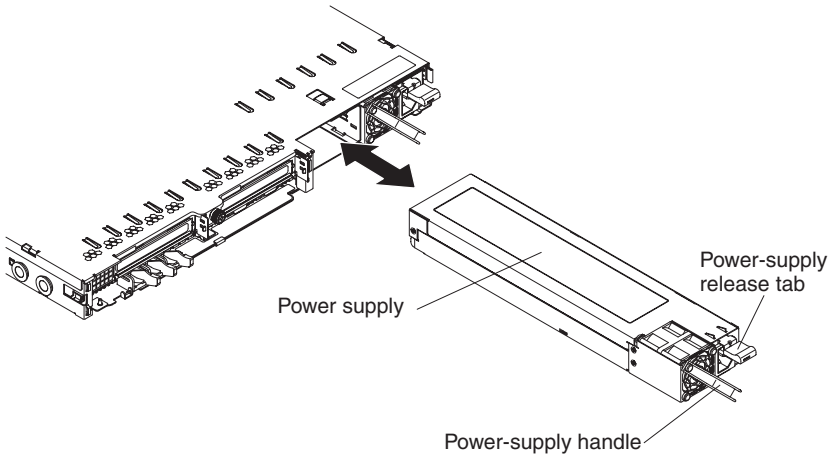
**Statement 8:**

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

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

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

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.




2. Grasp the handle on the rear of the power supply and slide the power supply forward fully into the server until it clicks in place.
3. Connect the power cord to the power-cord connector on the power supply, being sure to route the cord through the power supply handle to minimize mechanical strain on the cord.
4. Route the power cord through the cable management arm, if one is installed.
5. Connect the other end of the power cord to a properly grounded electrical outlet.
6. Make sure that the ac power LED and the dc power LED on the power supply are lit, indicating that the power supply is operating correctly. The two green LEDs are to the left of the power-cord connector.

## Removing a hot-swap fan assembly

The server has four hot-swap fans that cool the memory DIMMs and the CPU. The following table identifies the fan number, locations and the corresponding component cooling area.

*Table 6.*

| Thermal Zone | Zone 1 | Zone 2 | Zone 3 |
|---|---|---|---|
| Cooling area | Memory | CPU | NA |

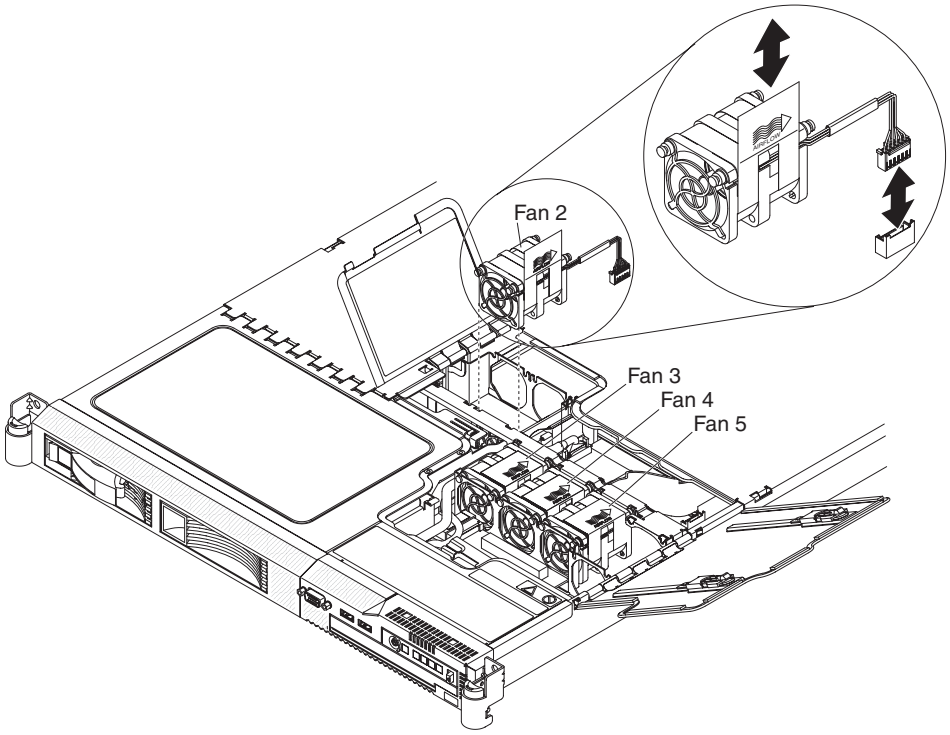
*Table 6. (continued)*

| Thermal Zone | Zone 1 | | Zone 2 | | | Zone 3 |
|---|---|---|---|---|---|---|
| Physical Fan number | Empty | Fan 4 | Fan 6 | Fan 8 | Fan 10 | Empty |
| | Empty | Fan 3 | Fan 5 | Fan 7 | Fan 9 | Empty |
| System Fan location | Fan set 1 | Fan set 2 | Fan set 3 | Fan set 4 | Fan set 5 | Fan set 6 |

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

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

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Slide the server forward to gain access to the fan doors.
3. Open the fan doors and look for a lit LED near the connector of the failing fan.




4. Press the top of the tab on the cable connector and disconnect the cable of the failing fan from the connector on the system board.
5. Pull up on the orange tab to lift the fan out of the server.
6. If you are instructed to return the fan assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

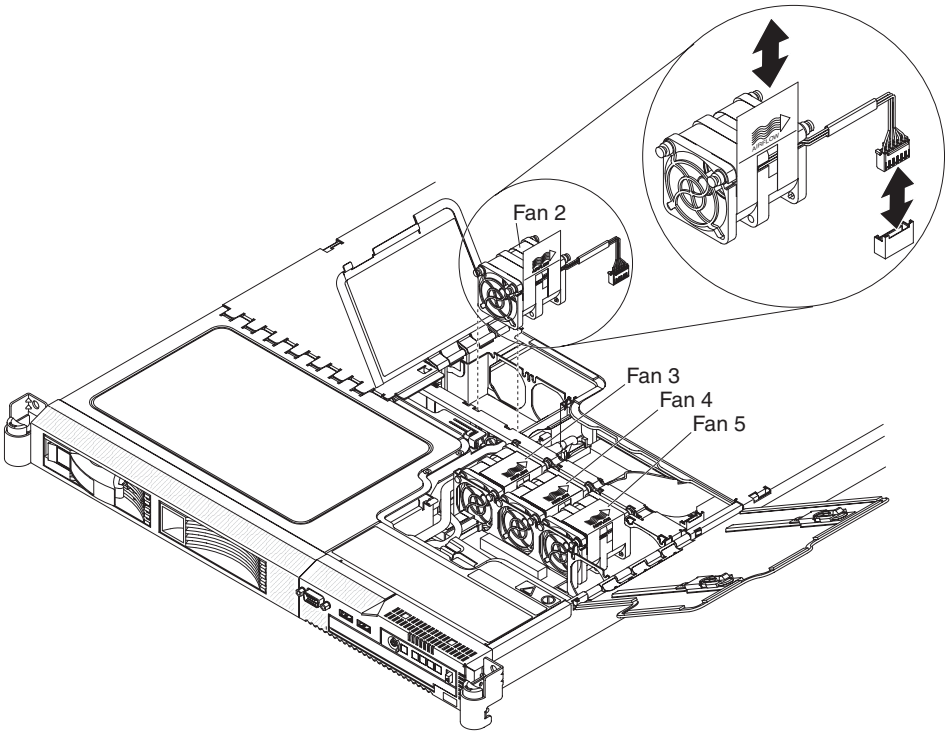
## Installing a hot-swap fan assembly

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

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

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53

2. Orient the new fan in the same position as the fan that you removed. Make sure that the airflow indicator, on the top of the fan, is pointing to the rear of the server

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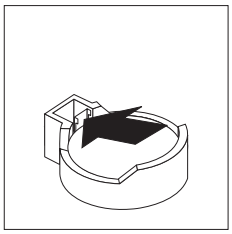
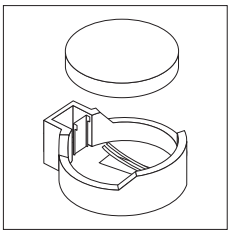
3. Push the fan assembly down into the server until the blue mounting grommets are correctly seated.
4. Connect the cable of the replacement fan into the connector.
5. Close the fan door.
6. Slide the server into the rack.

## Removing the battery

To remove the battery, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Turn off the server and peripheral devices and disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. See “System-board internal connectors” on page 8 for the location of the battery.
5. Remove the battery:
   a. Use a non-conductive alignment tool to press the top of the battery clip away from the battery. The battery pops up when it is released.
   b. Lift and remove the battery from the socket.





6. Dispose of the battery as required by local ordinances or regulations (See “Battery return program” on page 224 for information about disposing of the battery).

## Installing the battery

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

- You must replace the battery with a lithium battery of the same type from the same manufacturer.
- To order replacement batteries, call 1-800-426-7378 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM marketing representative or authorized reseller.
- After you replace the system-board battery, you must reconfigure the server 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.**

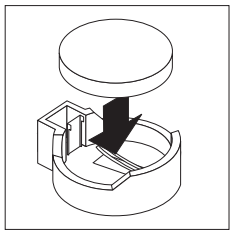
*Do not:*

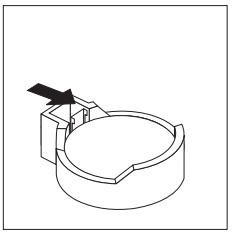
- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

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

To install the replacement battery, complete the following steps.

1. Follow any special handling and installation instructions that come with the replacement battery.
2. Insert the replacement battery:
   a. Tilt the battery so that you can insert it into the socket on the side opposite the battery clip.
   b. Press the battery down into the socket until it clicks into place. Make sure that the battery clip holds the battery securely.





3. Install the cover (see “Installing the cover” on page 58).
4. Slide the server into the rack.
5. Reconnect the external cables and the power cords
6. Turn on the peripheral devices and the server.
7. Start the Configuration/Setup Utility program and reset the configuration.
   - Set the system date and time.
   - Set the power-on password.
   - Reconfigure the server.

   See “Using the Configuration/Setup Utility program” on page 16 for details.

# Removing and replacing Tier 2 CRUs

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.

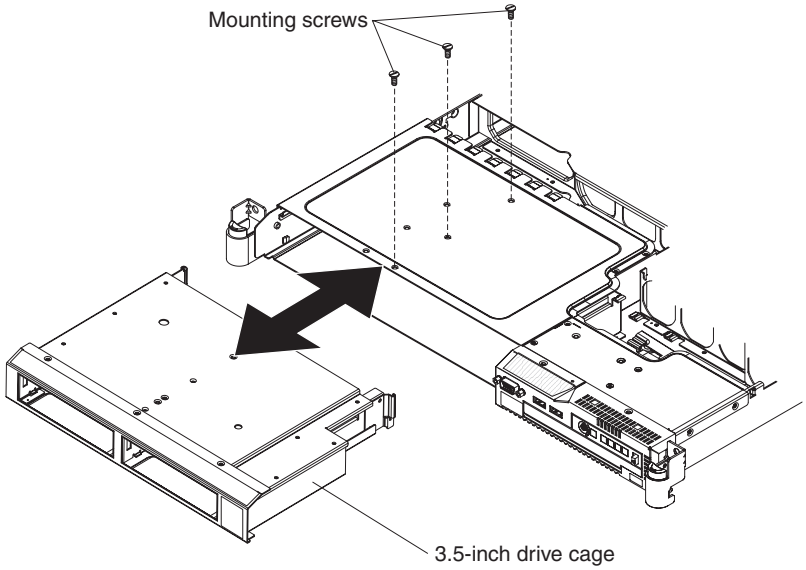
The illustrations in this document might differ slightly from your hardware.

# Removing and installing a disk drive cage assembly

## Removing a 3.5-inch disk drive cage assembly

To remove a 3.5-inch SAS disk drive cage assembly, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. Remove the drives from the server (see “Removing and installing internal drives” on page 68).
5. Remove the backplane or backplate (see “Removing the 3.5-inch SAS/SATA hot-swap backplane or SATA simple-swap backplate” on page 92).
6. Remove the three mounting screws that hold the drive cage in place.

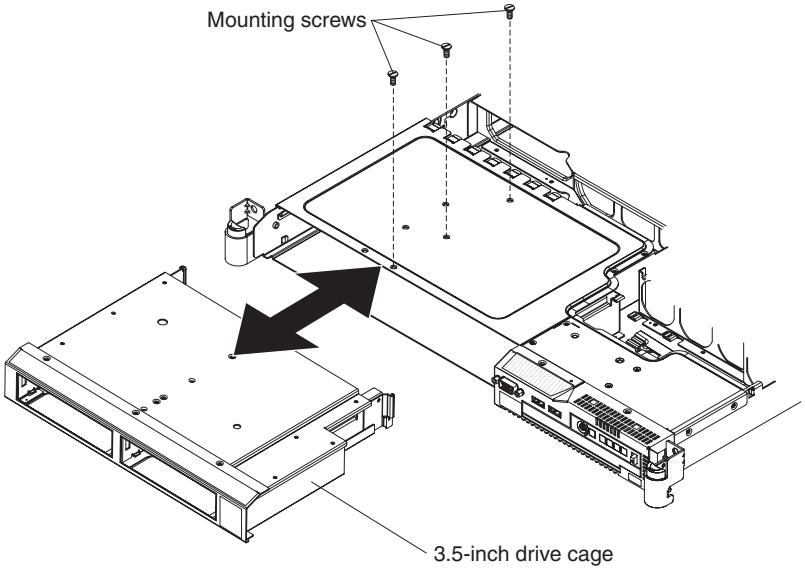



7. Slide the drive cage assembly forward and remove it from the server.
8. If you are instructed to return the drive cage, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a 3.5-inch disk drive cage assembly

To install the replacement 3.5-inch disk drive cage assembly, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Line up the drive cage with the drive bay on the front of the server.
3. Slide the drive cage into the server until it stops.



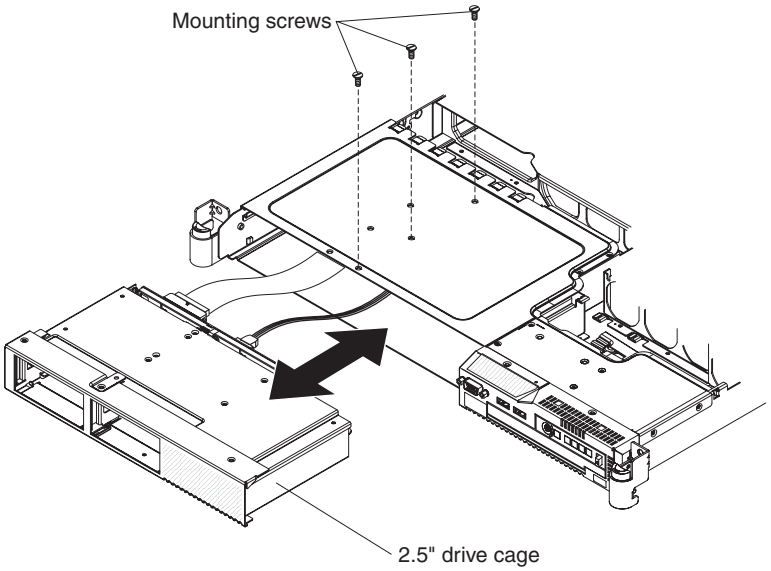

4. Install the 3.5-inch backplane or backplate (see “Installing the 3.5-inch SAS/SATA hot-swap backplane or SATA simple-swap backplate” on page 92).
5. Align the holes in the top of the drive cage with the holes in the top of the chassis; then, insert the screws that secure the drive cage to the chassis.

6. Install the removed drives (see “Removing and installing internal drives” on page 68).
7. Install the cover (see “Installing the cover” on page 58).
8. Slide the server into the rack.
9. Reconnect the external cables and the power cords.
10. Turn on the peripheral devices and the server.

## Removing a 2.5-inch disk drive cage assembly

To remove a 2.5-inch disk drive cage assembly, complete the following steps.

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Turn off the server and peripheral devices and disconnect the power cords and external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. Remove the drives from the server (see “Removing and installing internal drives” on page 68).
5. Remove the cables from the system board and the power backplane.
6. Remove the three mounting screws that hold the drive cage in place.



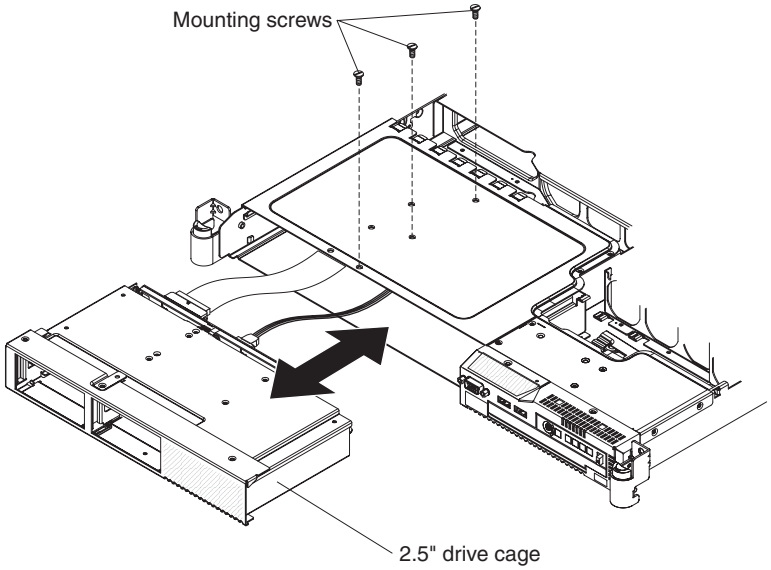

7. Slide the drive cage assembly forward and remove it from the server.
8. Remove the backplane. (See “Removing the 2.5-inch SAS backplane” on page 93).
9. If you are instructed to return the drive cage, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a 2.5-inch disk drive cage assembly

To install the replacement 2.5-inch disk drive cage assembly, complete the following steps.

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Install the 2.5-inch backplane. (See “Installing the 2.5-inch SAS backplane” on page 94).
3. Line up the drive cage with the drive bays on the front of the server.
4. Slide the drive cage into the server until it stops.

5. Align the holes in the top of the drive cage with the holes in the top of the chassis; then, insert the mounting screws that secure the drive cage to the chassis.

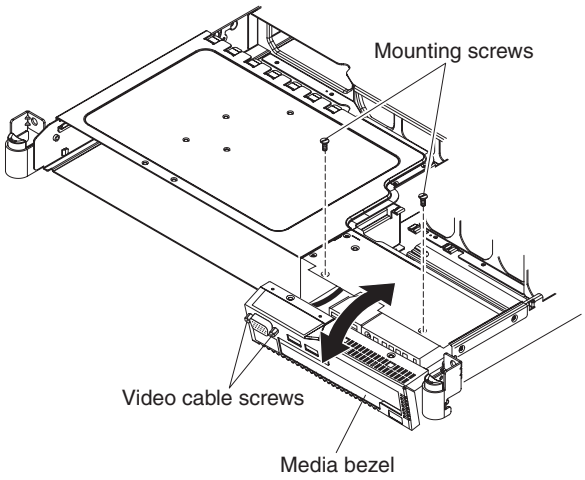



6. Reconnect the cables to the system board and the power backplane.
7. Install the removed drives (see “Removing and installing internal drives” on page 68).
8. Install the cover (see “Installing the cover” on page 58).
9. Slide the server into the rack.
10. Reconnect the external cables and the power supply.
11. Turn on the peripheral devices and the server.

## Removing the media bezel

To remove the media bezel, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. Remove the hard disk drive cage (see “Removing and installing a disk drive cage assembly” on page 85).
5. Remove fan number 3 (see “Removing a hot-swap fan assembly” on page 81).
6. Disconnect the video cable from the connector on the system board.

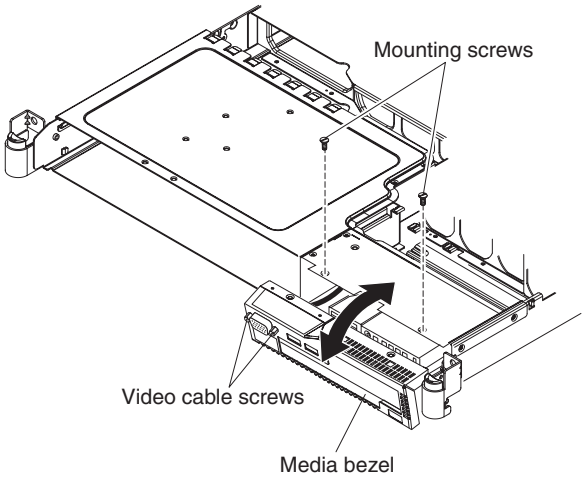



7. Remove the two mounting screws in the top of the media bezel.
8. Rotate the media bezel downward to disengage it from the chassis and carefully pull the video cable out of the server. Remove the cable and the bezel from the server.
9. If you are instructed to return the media bezel, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the media bezel

To install the replacement bezel, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. If you need to attach the video cable to the bezel, use the two video cable screws that came with the kit.



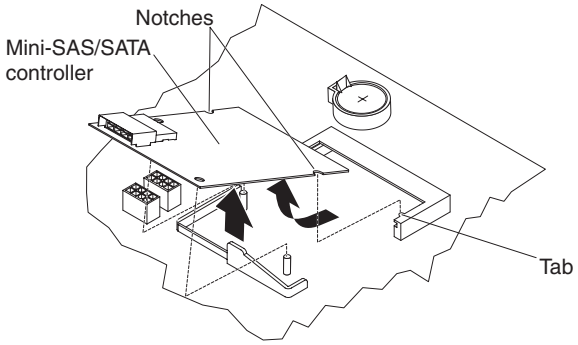

3. Insert the video cable through the opening in the front of the chassis.
4. Insert the tabs on the bottom of the bezel into the corresponding holes in the bottom of the chassis.
5. Rotate the top of the bezel up to the chassis.
6. Attach the bezel to the chassis using the two mounting screws you removed previously.

7. Route the video cable through the server and attach it to the VGA connector on the system board (see “System-board internal connectors” on page 8 for the connector location).
8. Install fan number 3 (see “Installing a hot-swap fan assembly” on page 82).
9. Install the hard disk drive cage assembly (see “Removing and installing a disk drive cage assembly” on page 85).
10. Install the cover (see “Installing the cover” on page 58).
11. Slide the server into the rack.
12. Connect the external cables and the power cords.
13. Turn on the peripheral devices and the server.

## Removing the mini-SAS/SATA controller (hot-swap models)

To remove the mini-SAS/SATA controller from the system board, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. Disconnect the cable from the SAS/SATA controller.

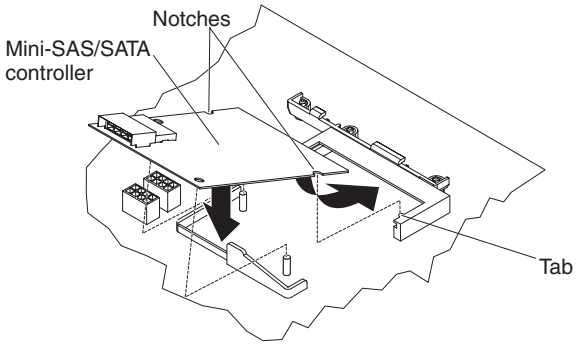



5. Release the side tabs on the connector from the notches in the sides of the controller.
6. Grasp the edges of the SAS/SATA controller.
7. Pinch the top of each of the two plastic alignment pins while you gently lift the controller, until the alignment pins release the controller.
8. Gently pull the controller forward; then, lift the controller off the system board.
9. If you are instructed to return the SAS/SATA controller, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the mini-SAS/SATA controller (hot-swap models)

To install the replacement mini-SAS/SATA controller, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Grasp the edges of the SAS/SATA controller.



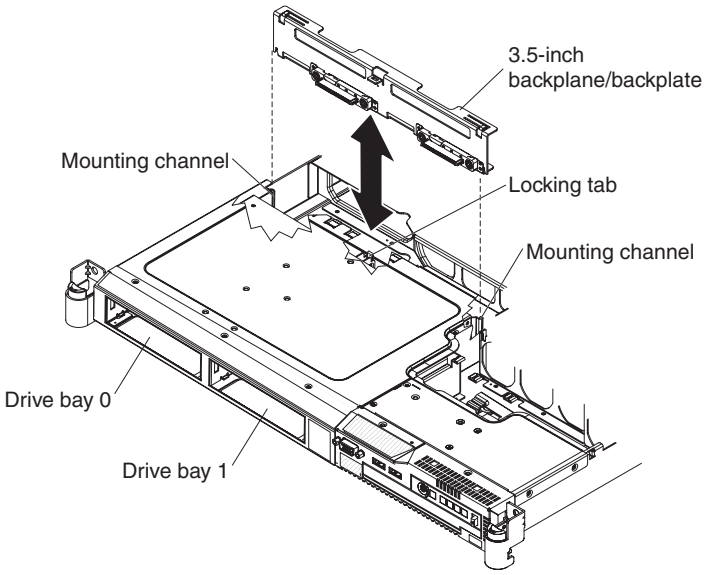

3. Gently insert the controller into the SAS/SATA controller connector on the system board (see “System-board internal connectors” on page 8 for the location of the connector) while you align the holes in the controller with the two plastic alignment pins on the system board.
4. Press the controller firmly onto the alignment pins until the controller clicks into place. Make sure that the top of each alignment pin has expanded to hold the controller securely in place.
5. Push the controller toward the right of the server, fully into the connector, until the side tabs on the connector rest in the side notches of the controller.
6. Connect the cable from the hard disk drive backplane to the SAS/SATA controller.
7. Install the cover (see “Installing the cover” on page 58).
8. Slide the server into the rack.
9. Connect the external cables and the power cords.
10. Turn on the peripheral devices and the server.

## Removing the 3.5-inch SAS/SATA hot-swap backplane or SATA simple-swap backplate

To remove the 3.5-inch SAS/SATA backplane or simple-swap SATA backplate, complete the following steps.

**Note:** The following illustration shows removing the 3.5-inch hot-swap SAS backplane.

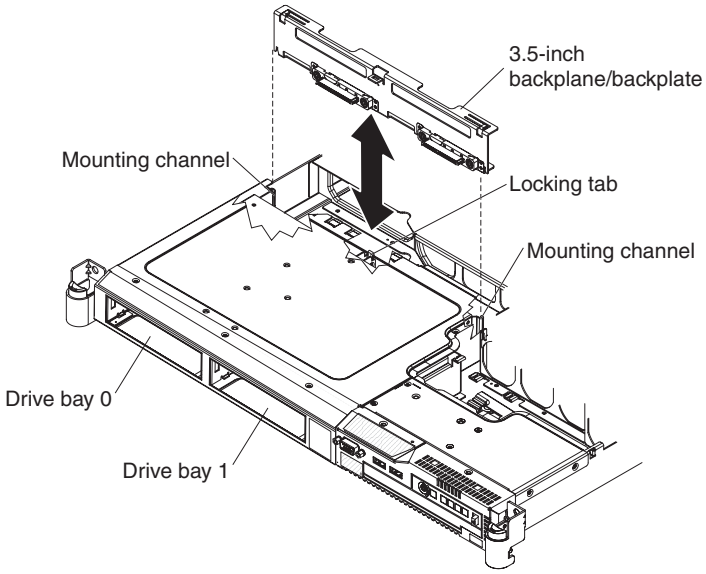
1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Turn off the server and peripheral devices and disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 57).




4. Pull the hard disk drives out of the server slightly to disengage them from the backplane or backplate.
5. Disconnect the backplane or backplate cables.
   - If the server is a hot-swap model, disconnect the SAS/SATA controller cable from the backplane and disconnect the power cable from the power backplane.
   - If the server is a simple-swap model, disconnect the two signal cables from the system board, and disconnect the power cable from the power backplane.
6. Lift the backplane or backplate out of the server and disconnect the power cable from the backplane or backplate..
7. If you are instructed to return the hot-swap backplane or simple-swap backplate, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the 3.5-inch SAS/SATA hot-swap backplane or SATA simple-swap backplate

To install the replacement 3.5-inch SAS/SATA hot-swap backplane or SAS simple-swap backplate, complete the following steps.



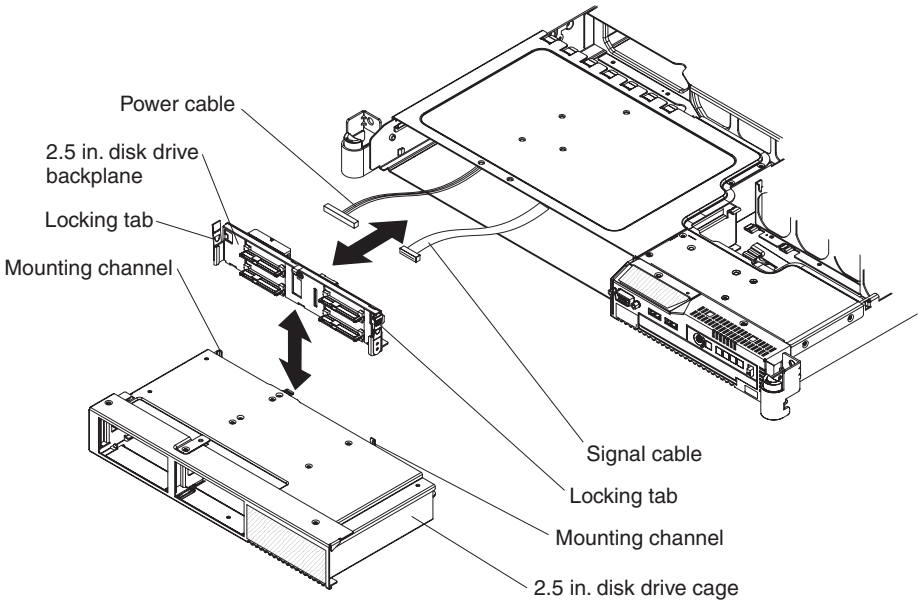

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Connect the power cable to the backplane or backplate.
3. Slide the connector on the right side of the backplane or backplate under the top edge on the rear of the drive cage; then, slide the backplane or backplate into the mounting channels, making sure that any nearby cables are not trapped or pinched.
4. Press firmly until the backplane or backplate is fully seated and the locking tab is in place.
5. Reconnect the backplane or backplate signal cables and power cables:
   - If the server is a hot-swap model, connect the SAS/SATA controller cable to the backplane and connect the power cable to the power backplane.
   - If the server is a simple-swap model, connect the two signal cables to the system board. Make sure that the signal cables from drive bay 0 and drive bay 1 are connected to the corresponding SATA connectors on the system board (see “System-board internal connectors” on page 8 for the location of the connectors). Connect the power cable to the power backplane.
6. Install the cover (see “Installing the cover” on page 58).
7. Replace the hard disk drives.
8. Slide the server into the rack.
9. Reconnect the external cables and the power cords.
10. Turn on the peripheral devices and the server.

## Removing the 2.5-inch SAS backplane

To remove the 2.5-inch SAS backplane, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Turn off the server and peripheral devices and disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. Pull the hard disk drives out of the server slightly to disengage them from the backplane.

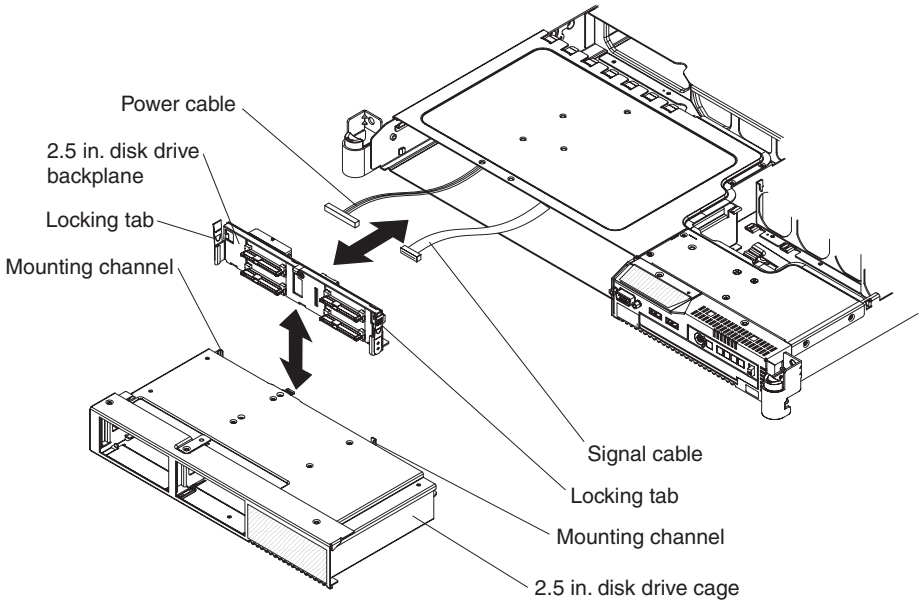
5. Disconnect the power cable from the power backplane.
6. Disconnect the signal cable from the mini-SAS/SATA controller.
7. Remove the disk drive cage (see “Removing a 2.5-inch disk drive cage assembly” on page 87).




8. Press the locking tabs toward each other and lift the backplane off the disk drive cage.
9. Disconnect the power cable and the signal cable from the disk drive backplane.
10. If you are instructed to return the backplane, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the 2.5-inch SAS backplane

To install the replacement 2.5-inch SAS backplane, complete the following steps:

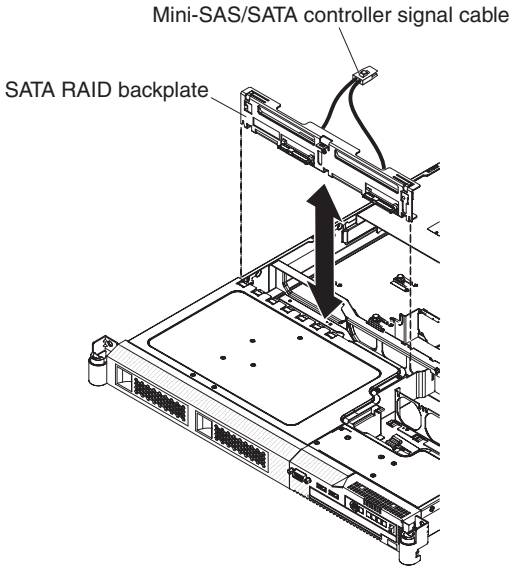


1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Connect the power cable and signal cable to the replacement backplane.
3. Insert the backplane into the drive cage. Press firmly until the backplane is fully seated and the locking tabs snap into place.
4. Reinstall the hard disk drive cage (see “Installing a 2.5-inch disk drive cage assembly” on page 87).
5. Reconnect the signal cable to the mini-SAS/SATA controller.
6. Reconnect the power cable to the power backplane.
7. Install the cover (see “Installing the cover” on page 58).
8. Replace the hard disk drives.
9. Slide the server into the rack.
10. Reconnect the external cables and the power cords.
11. Turn on the peripheral devices and the server.

## Removing a SATA RAID backplate

To remove the SATA RAID backplate, complete the following steps:

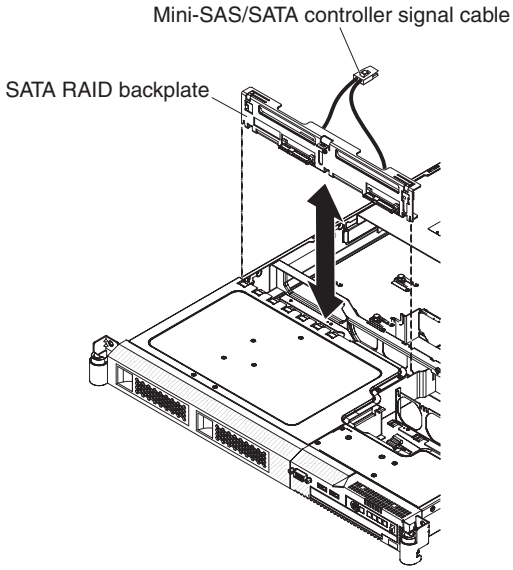
1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. Pull the hard disk drives out of the server slightly to disengage them from the backplane or remove the drives completely (see “Removing a simple-swap SATA hard disk drive” on page 69).




5. Disconnect the signal cable from the mini-SAS/SATA controller and disconnect the power cable from the power backplane.
6. Lift the backplate out of the server and disconnect the power cable from the SATA RAID backplate.
7. If you are instructed to return the SATA RAID backplate, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a SATA RAID backplate

To install the replacement SATA RAID backplate, complete the following steps:

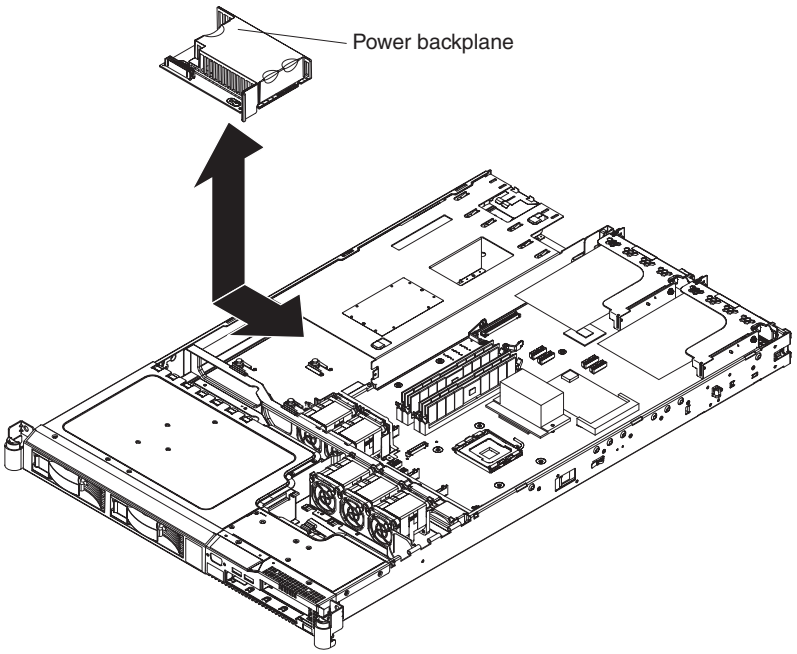



1. Install the backplate:
   a. Connect the power cable to the SATA RAID kit backplate.
   b. Slide the connector on the right side of the backplate under the top, rear edge of the drive cage; then, slide the backplate into the guide channels, making sure that any nearby cables are not trapped or pinched.
   c. Press firmly until the backplate is fully seated.
2. Connect the signal cable from the backplate to the connector on the mini-SAS/SATA controller and connect the power cable to the power backplane.
3. Install the cover (see “Installing the cover” on page 58).
4. Insert the hard disk drives into the bays (see “Installing a simple-swap hard disk drive” on page 70 ).
5. Slide the server into the rack.
6. Reconnect the external cables and the power cords.
7. Turn on the peripheral devices and the server.

## Removing the power backplane

To remove the power backplane, complete the following steps.

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. Remove the power supplies from the power-supply bays (see “Removing a power supply” on page 79).
5. Disconnect the hard disk drive power cable connected to the power backplane.

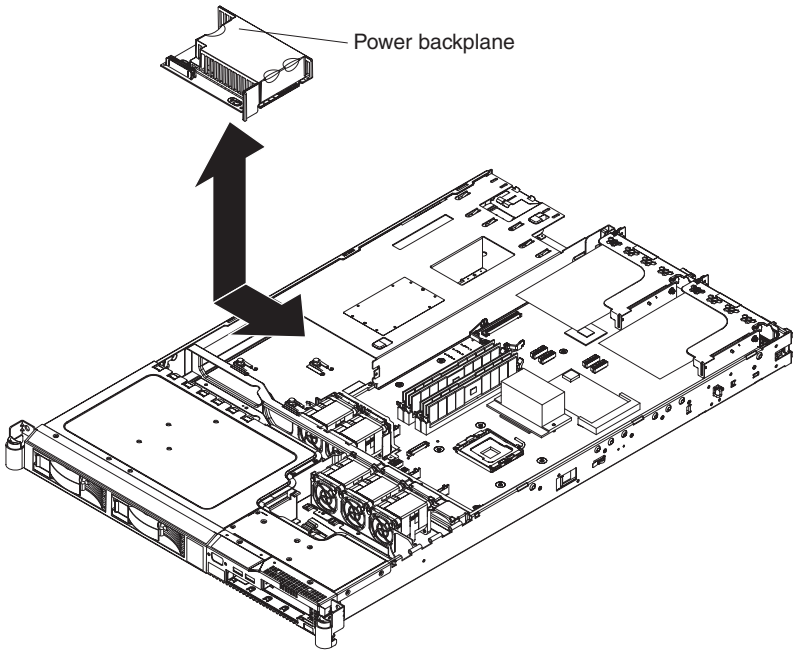



6. Slide the power backplane to the left, disconnecting it from the system board.
7. Lift the power backplane out of the server.
8. If you are instructed to return the power backplane, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the power backplane

To install the replacement power backplane, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Align the keyhole slots in the power backplane with the mounting pins in the server.




3. Slide the power backplane toward the right side of the server until the edge-connectors are fully connected.
4. Reconnect the hard disk drive power cable to the power backplane.
5. Install the power supplies into the power-supply bays (see “Installing a power supply” on page 80).
6. Install the cover (see “Installing the cover” on page 58).
7. Slide the server into the rack.
8. Reconnect the external cables and the power cords.
9. Turn on the peripheral devices and the server.

## Removing and replacing FRUs

FRUs must be replaced or installed only by trained service technicians.

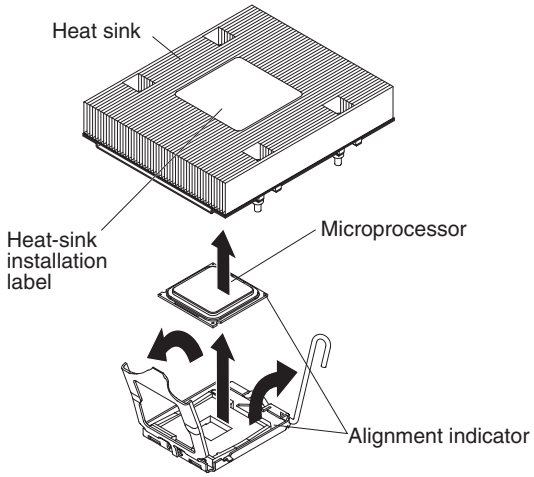
The illustrations in this document might differ slightly from the hardware.

## Removing a microprocessor

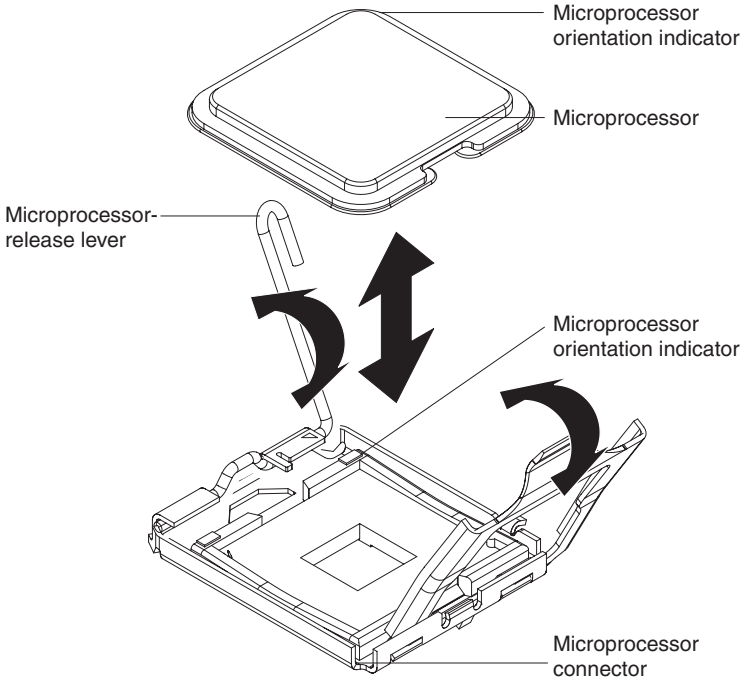
**Attention:**

- Do not allow the thermal grease on the microprocessor and heat sink to come in contact with anything. Contact with any surface can compromise the thermal grease and the microprocessor socket.
- Dropping the microprocessor during installation or removal can damage the contacts.
- Do not touch the microprocessor contacts; handle the microprocessor by the edges only. Contaminants on the microprocessor contacts, such as oil from your skin, can cause connection failures between the contacts and the socket.

To remove a microprocessor and heat sink, complete the following steps.




1. Read the safety information that begins on page vii and “Installation guidelines” on page 53
2. Turn off the server and peripheral devices and disconnect all the power cords.
3. Remove the cover (see “Removing the cover” on page 57).
4. Remove the heat sink. Loosen two captive screws on alternate sides of the heat sink fully before you loosen the other two captive screws (this helps to break the bond between the heat sink and the microprocessor). After the captive screws are loosened, remove the heat sink.




5. Open the microprocessor-release lever to the fully open position.
6. Open the microprocessor bracket frame.
7. Carefully remove the microprocessor.
8. If you are instructed to return the microprocessor, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a microprocessor

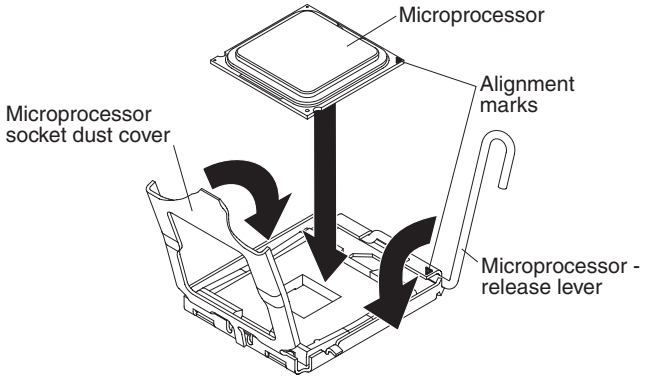
The following notes describe the type of microprocessor that the server supports and other information that you must consider when you install a microprocessor.

- The server supports one Intel dual-core or quad-core flip-chip land grid array 775 (FC-LGA 775) microprocessor, which is designed for the LGA 775 socket. The type, speed, and L2 cache of the microprocessor depend on the server model. See http://www.ibm.com/servers/eserver/serverproven/compat/us/ for a list of supported microprocessors.
- Read the documentation that comes with the microprocessor to determine whether you must update the basic input/output system (BIOS) code. To download the most current level of BIOS code, complete the following steps:
  1. Go to http://www.ibm.com/systems/support/.
  2. Under Product support, click **System x**.
  3. Under **Popular links**, click **Software and device drivers**.
  4. Click **System x3350** to display the matrix of downloadable files for the server.
- The microprocessor uses an integrated voltage regulator on the system board.

**Attention:** If you are installing a microprocessor that has been removed, make sure that it is paired with its original heat sink or a new replacement heat sink. Do not reuse a heat sink from another microprocessor; the thermal grease distribution might be different and might affect conductivity.

To install a new or replacement microprocessor, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53



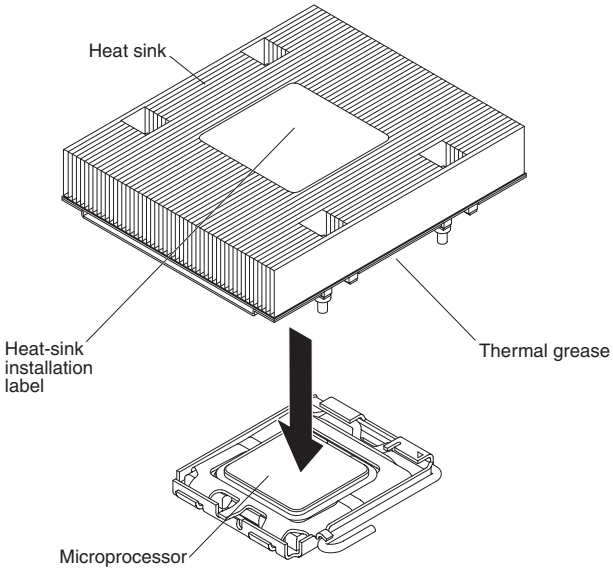

2. Align the microprocessor with the socket (note the alignment mark and the position of the notches); then, carefully place the microprocessor on the socket and close the microprocessor bracket frame.

   **Attention:** Do not use excessive force when you insert the microprocessor into the socket.

   **Note:** The microprocessor fits only one way on the socket.

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

   **Attention:** Do not touch the thermal grease on the bottom of the heat sink or set down the heat sink after the plastic cover is removed. Touching the thermal grease will contaminate it.




4. Install the heat sink on the top of the microprocessor, and tighten the captive screws half-way. After you've tightened all four screws half-way, then alternate tightening the screws again until they are tight, making sure that you do not overtighten any of them.
5. Install the cover (see “Installing the cover” on page 58).
6. Slide the server into the rack.
7. Reconnect the external cables and the power cords.
8. Turn on the peripheral devices and the server.

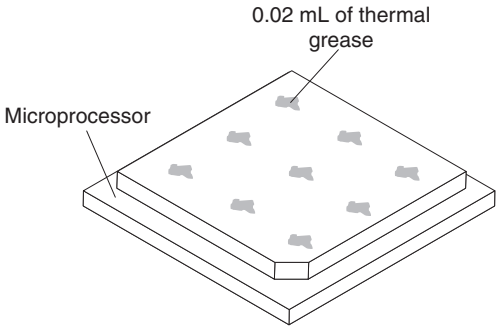
## Thermal grease

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.

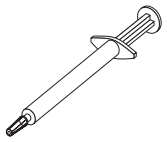
To replace damaged or contaminated thermal grease on the microprocessor and heat sink, complete the following steps:

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 9 uniformly spaced dots of 0.02 mL each on the top of the microprocessor. The outermost dots must be within 5 mm of the edge.

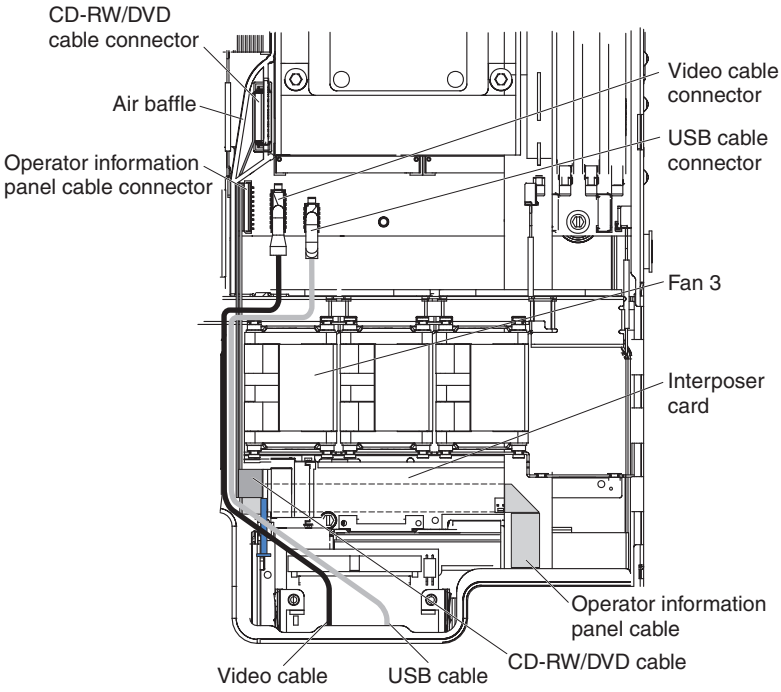


   **Note:** 0.01mL is one tick mark on the syringe. If the grease is properly applied, approximately half of the grease will remain in the syringe.
6. Install the heat sink onto the microprocessor as described in “Installing a microprocessor” on page 100.

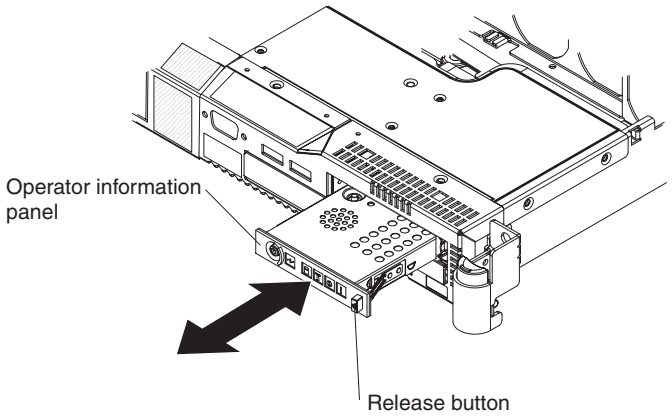
## Removing the operator information panel assembly

To remove the operator information panel, complete the following steps:

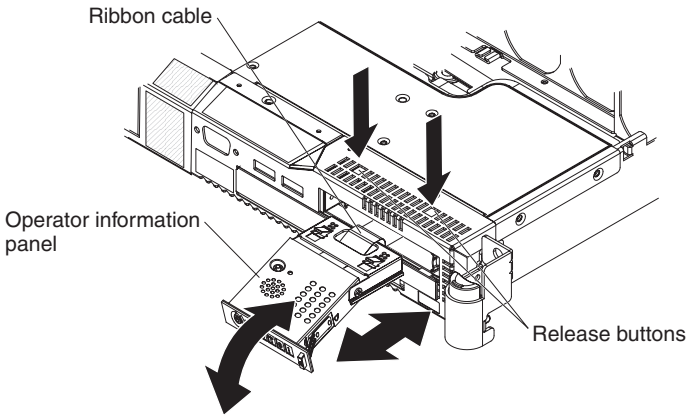
1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and peripheral devices and disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 57).
4. Remove the CD-RW/DVD interposer card (see “Removing the CD-RW/DVD drive interposer card” on page 72).
5. Remove fan 3 (see “Removing a hot-swap fan assembly” on page 81).
6. Remove the center air baffle.




7. Disconnect the following cables from the system board:
   a. Video cable
   b. USB cable
   c. CD-RW/DVD cable
   d. Operator-information-panel ribbon cable
8. Slide the operator-information-panel ribbon cable out of the card guides on the bottom of the chassis and on the rear of the panel housing.




9. Press the release button on the front of the operator information panel and slide the assembly out of the server.

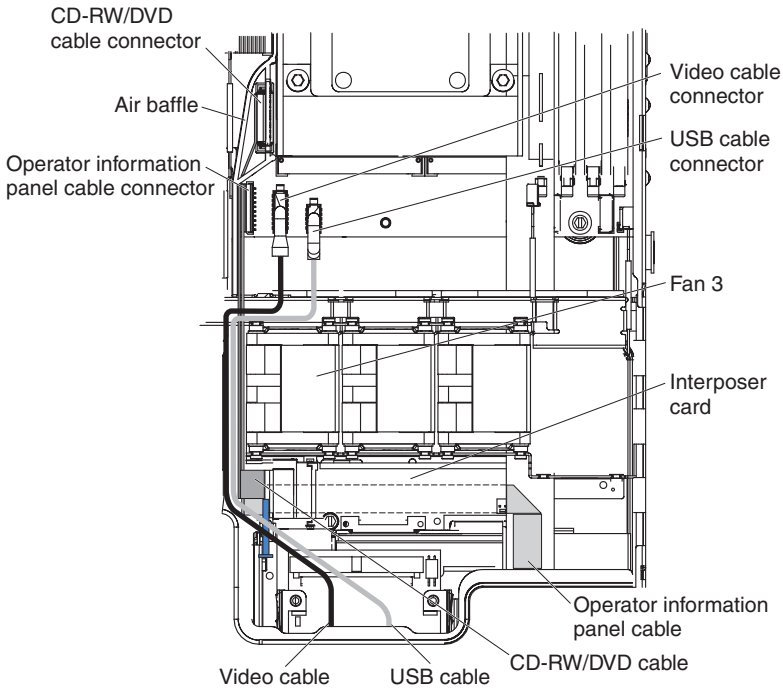



10. Using a pencil or screwdriver, press the release buttons through the top of the server and slide the operator information panel assembly rails out of the server as far as they will go.
11. Pull the panel away from the rails and carefully pull the attached ribbon cable out of the server.
12. If you are instructed to return the operator information panel assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

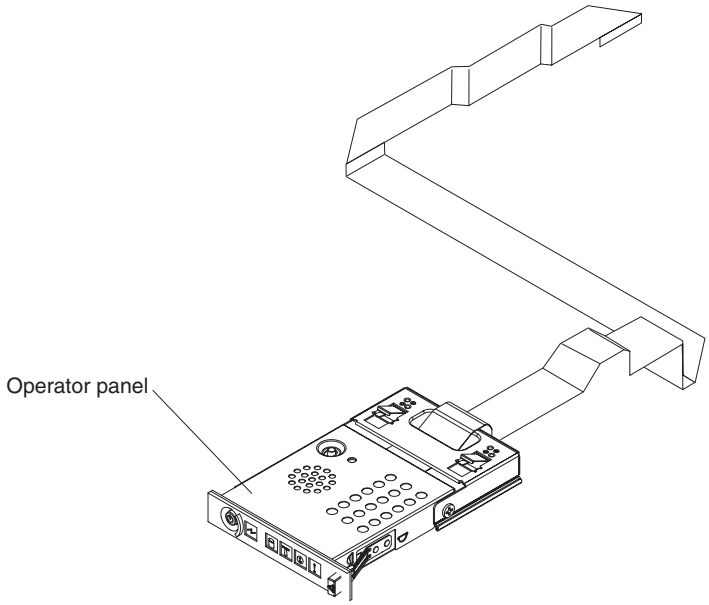
## Installing the operator information panel assembly

To install the replacement operator information panel, complete the following steps:

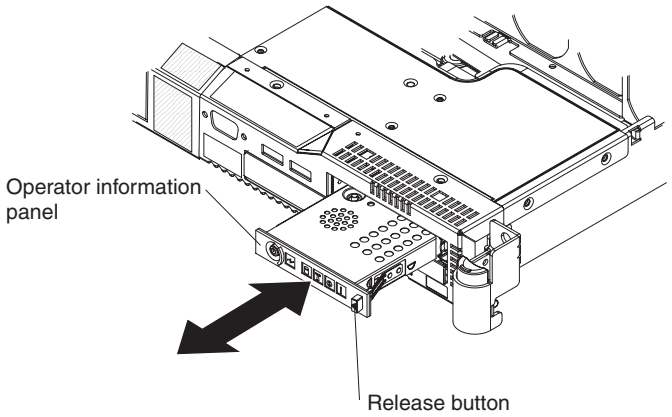
1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.




2. From the front of the server, thread the operator-information-panel ribbon cable through the panel housing in the server; then, through the opening in the rear of the panel housing.
3. Slide the ribbon cable into the cable guide on the back of the panel housing.
4. Fold the ribbon cable according to the following illustration.




5. Continue threading the ribbon cable through the cable guides on the bottom of the chassis; then, route it through the opening in the bulkhead beside fan 3 and connect it to the front panel connector on the system board.




6. Slide the operator information panel into the server until it clicks into place.
7. Connect the following cables to the system board:
   a. CD-RW/DVD cable
   b. USB cable
   c. Video cable
8. Install the center air baffle into the system board (see “Installing the side air baffle” on page 59.
9. Install fan 3 (see “Installing a hot-swap fan assembly” on page 82).
10. Install the CD-RW/DVD drive interposer card (see “Installing the CD-RW/DVD drive interposer card” on page 73).
11. Install the cover (see “Installing the cover” on page 58).
12. Slide the server into the rack.
13. Reconnect the power cords and any cables that were removed.
14. Turn on the peripheral devices and the server.

## Removing the system board

To remove the system board, complete the following step:.

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.
2. Turn off the server and any attached devices.

   **Note:** When you replace the system board, you must either update the server with the latest firmware or restore the pre-existing firmware that the customer provides on a diskette or CD image. Make sure that you have the latest firmware or a copy of the pre-existing firmware before you proceed.
3. Turn off the peripheral devices and disconnect the power cords and all external cables.
4. Remove the cover (see “Removing the cover” on page 57).
5. Remove the two air baffles from the system board. See “Removing the side air baffle” on page 59 and “Removing the center air baffle” on page 60.
6. Remove all riser card assemblies and adapters, including the Remote Supervisor Adapter II SlimLine, if one is installed (see “Removing an adapter” on page 64 and “Removing a Remote Supervisor Adapter II SlimLine” on page 66).
7. Remove the mini-SAS/SATA controller, if one is installed (see “Removing the mini-SAS/SATA controller (hot-swap models)” on page 90.

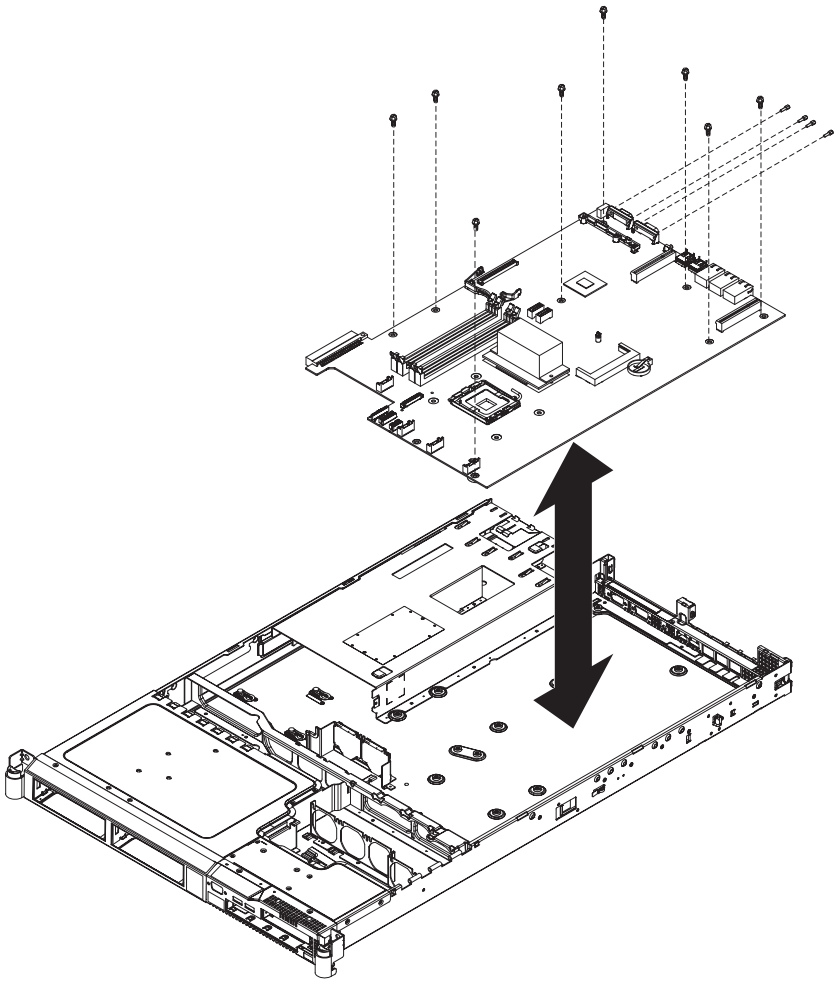
8. Disconnect all cables from the system board. Make a list of each cable as you disconnect it; you can then use this as a checklist during system-board installation.

   **Attention:** In the following step, do not allow the thermal grease to come in contact with anything. Contact with any surface can compromise the thermal grease and the microprocessor socket.

9. Remove the heat sink and microprocessor, and set them aside on a static-protective surface for reinstallation (see “Removing a microprocessor” on page 99).
10. Remove the memory modules and set them aside on a static-protective surface for reinstallation (see “Removing a memory module (DIMM)” on page 74).

    **Note:** Note the location of each DIMM as you remove it, so that you can later reinstall it in the same connector.

11. Slide the power supplies out of the bays slightly or remove them entirely (see “Removing a power supply” on page 79).
12. Slide the power backplane to the left side of the server (see “Removing the power backplane” on page 96).



13. Remove the eight screws on the system board that secure the system board to the chassis.
14. Remove the four hex standoff screws that attach the serial connector and the video connector to the rear of the server.

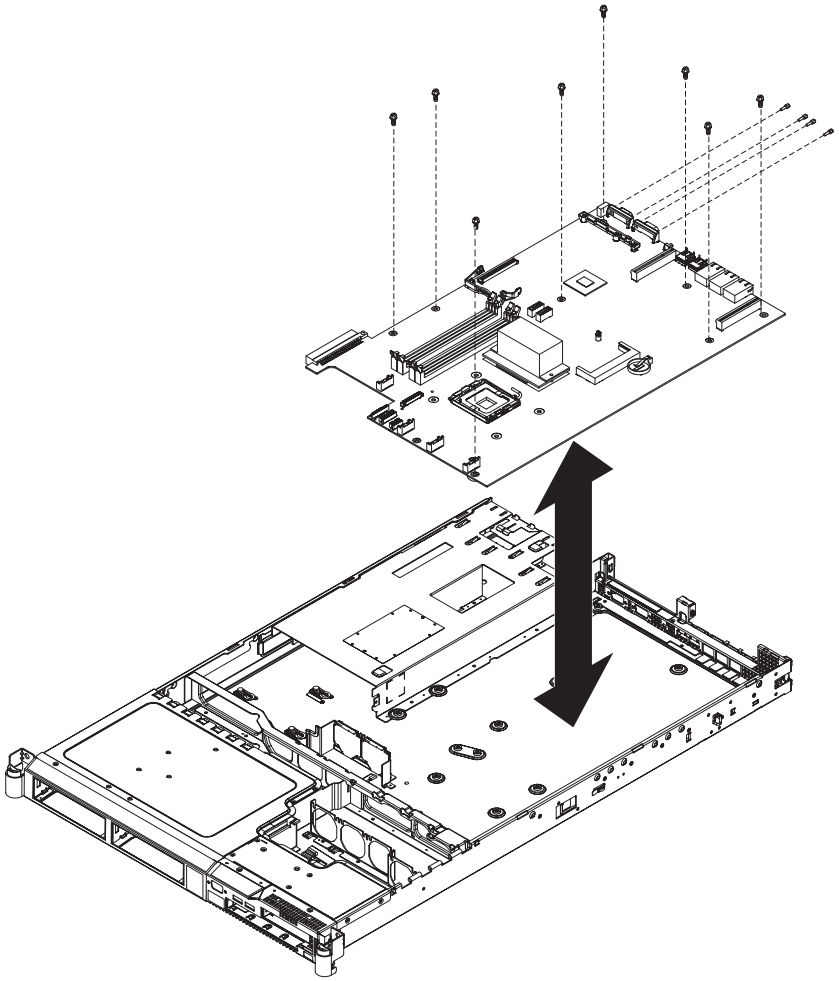
15. Lift the system board slightly so that it disengages from the locator pin.
16. Slide the system board slightly toward the front of the server.
17. Lift up the left side of the system board.
18. Lift the rest of the system board and carefully remove it from the server, being careful not to disturb any surrounding components.
19. If you are instructed to return the system board follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the system board

**Note:** When you reassemble the components in the server, be sure to route all cables carefully so that they are not exposed to excessive pressure.

To reinstall the system board, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 53.



2. Align the system board with the chassis and install the eight screws that you removed previously.
3. Install the microprocessor and microprocessor heat sink (see “Installing a microprocessor” on page 100).

4. Slide the power backplane toward the system board until the connectors mate (see “Installing the power backplane” on page 98).
5. Install the power supplies (see “Installing a power supply” on page 80).
6. Reconnect the system-board cables that you disconnected in step 8 in “Removing the system board” on page 106.
7. Install the DIMMs (see “Installing a memory module (DIMM)” on page 75).
8. Install the riser-card assemblies and all adapters.
9. Install the mini-SAS/SATA controller (see “Installing the mini-SAS/SATA controller (hot-swap models)” on page 90).
10. Install the Remote Supervisor Adapter II SlimLine if you removed one previously (see “Installing a Remote Supervisor Adapter II SlimLine” on page 66).
11. Install the video connector and the serial connector at the rear of the server with the four hex standoff screws that you removed in step 14 on page 107 in “Removing the system board” on page 106.
12. Install the air baffles (see “Installing the side air baffle” on page 59).
13. Install the cover (see “Installing the cover” on page 58).
14. Slide the server into the rack.
15. Reconnect the power cords and any cables that you removed.
16. Turn on the peripheral devices and the server.

**Important :** Either update the server with the latest RAID firmware or restore the pre-existing firmware from a diskette or CD image.

# Chapter 5. Diagnostics

This chapter describes the diagnostic tools that are available to help you solve problems that might occur in the server.

If you cannot locate and correct a problem by using the information in this chapter, see Appendix A, “Getting help and technical assistance,” on page 219 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.
- **Troubleshooting tables**

  These tables list problem symptoms and actions to correct the problems. See “Troubleshooting tables” on page 129.
- **Light path diagnostics**

  Use the light path diagnostics to diagnose system errors quickly. See “Light path diagnostics” on page 142 for more information.
- **IBM Dynamic System Analysis Pre-boot Diagnostic programs**

  The IBM Dynamic System Analysis Diagnostic (DSA) diagnostic programs are the primary method of testing the major components of the server. The diagnostic programs are on the *Dynamic System Analysis Pre-Boot Diagnostics* CD. See “Diagnostic programs and messages” on page 148 for more information.
- **IBM Electronic Service Agent**

  IBM Electronic Service Agent is a software tool that monitors the server for hardware error events and automatically submits electronic service requests to the IBM Support Center. Also, it can collect and transmit system configuration information on a scheduled basis so that the information is available to you and your support representative. It uses minimal system resources, is available free of charge, and can be downloaded from the Web. For more information and to download Electronic Service Agent, go to http://www.ibm.com/support/electronic/serviceagent/.

## POST

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

If a power-on password is set, you must type the password and press Enter, when you are prompted, for POST to run.

If POST is completed without detecting any problems, a single beep sounds, and the server startup is completed.

# POST beep codes

A beep code is a combination of short or long beeps or a series of short beeps that are separated by pauses. For example, a “1-2-3” beep code is one short beep, a pause, two short beeps, and pause, and three short beeps. A beep code other than one beep indicates that POST has detected a problem. To determine the meaning of beep code, see “Beep code descriptions.” If no beep code sounds, see “No-beep symptoms” on page 115.

## Beep code descriptions

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

A single problem might cause more than one error message. When this occurs, correct the cause of the first error message. The other error messages usually will not occur the next time POST runs.

**Exception:** If there are multiple error codes or light path diagnostics LEDs indicate a microprocessor error, the error might be in the microprocessor or in the microprocessor socket. See “Microprocessor problems” on page 134 for information about diagnosing 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, System x3350 Type 4192 and 4193 server,” on page 45 to determine which components are CRUs and which components are FRUs.**
- **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 |
|---|---|---|
| No beep | System board failure. | (Trained service technician only) Replace the system board. |
| 1 | Single beep to indicate the successful completion of POST. | |
| 1-1-3 | CMOS write/read test failed. | 1. Reseat the battery.<br>2. Clear CMOS memory, see “System-board switches and jumpers” on page 10 for information about how to clear CMOS memory.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Battery<br>b. (Trained service technician only) System board |
| 1-1-4 | BIOS EEPROM checksum failed. | 1. Reinstall the server BIOS code(see “Recovering from a BIOS update failure” on page 208).<br>2. (Trained service technician only) Replace the system board. |
| 1-2-1 | Programmable interval timer failed. | (Trained service technician only) Replace the system board. |
| 1-2-2 | DMA initialization failed. | (Trained service technician only) Replace the system board. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 to determine which components are CRUs and which components are FRUs.**
- **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 |
|---|---|---|
| 1-2-3 | DMA page register write/read failed. | (Trained service technician only) Replace the system board. |
| 1-2-4 | RAM refresh verification failed. | 1. Reseat the DIMMs.<br>2. Replace the following components, one at a time, in the order shown:<br>a. DIMMs<br>b. (Trained service technician only) System board |
| 1-3-1 | 1st 64K RAM test failed. | 1. Reseat the DIMMs.<br>2. Replace the lowest-numbered pair of DIMMS with an identical known good pair of DIMMs; then, restart the server. Return one DIMM at a time from the failed pair to its connector, restarting the sever after each DIMM, to identify the failed DIMM.<br>3. Replace the following components, one at a time, in the order shown:<br>a. DIMMs<br>b. (Trained service technician only) System board |
| 2-1-1 | Secondary DMA register failed. | (Trained service technician only) Replace the system board. |
| 2-1-2 | Primary DMA register failed. | (Trained service technician only) Replace the system board. |
| 2-1-3 | Primary interrupt mask register failed. | (Trained service technician only) Replace the system board. |
| 2-1-4 | Secondary interrupt mask register failed. | (Trained service technician only) Replace the system board. |
| 2-3-4 | Search for video ROM failed. | 1. Reinstall the BIOS.<br>2. (Trained service technician only) Replace the system board. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 to determine which components are CRUs and which components are FRUs.**
- **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 |
|---|---|---|
| 3-3-2 | Critical SMBUS ($I^2C$ bus) error occurred. | 1. Disconnect server power, wait 30 seconds and retry.<br>2. Reseat the following components:<br>a. Hard disk drive signal cable (only for SAS drive)<br>b. Hard disk drive power cable<br>c. PCI Express riser card (if present)<br>d. PCI Express adapter (if present)<br>e. DIMMs<br>f. Hard disk drives<br>g. Hard disk drive backplane<br>h. (Trained service technician only) Microprocessor.<br>i. (Trained service technician only) System board<br>3. Replace the following components, one at a time, in the order shown, restarting the server each time:<br>a. Hard disk drive signal cable (only for SAS drive)<br>b. Hard disk drive power cable<br>c. PCI Express riser card (if present)<br>d. PCI Express adapter (if present)<br>e. DIMMs<br>f. Hard disk drives<br>g. Hard disk drive backplane<br>h. (Trained service technician only) Microprocessor.<br>i. (Trained service technician only) System board. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 to determine which components are CRUs and which components are FRUs.**
- **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. | 1. Make sure that the server contains the correct number of DIMMs, in the correct order; install or reseat DIMMS; then, restart the server.<br>**Important:** 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 **Boot Fail Count** option in the **Start Options** 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).<br>2. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. DIMMs<br>b. (Trained service technician only) System board |

## No-beep symptoms

The following table describes situations in which no beep code sounds when POST is completed.

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| No-beep symptom | Description | Action |
|---|---|---|
| No beeps occur, and the server operates correctly. | | 1. (Trained service technician only) Reseat the front information panel LED cable.<br>2. (Trained service technician only) Replace the front information panel LED assembly. |
| No beeps occur, and there is no video. | | See "Solving undetermined problems" on page 216. |

# Error logs

The system event/error log contains all of the error codes and messages that were generated during POST. The BMC system event log contains messages that were generated by the BMC. The system event/error log is a combined log that contains messages that were generated during POST and all system status messages from the service processor (BMC).

The system event/error log and BMC system event log are limited in size. When each log is full, new entries will not overwrite existing entries; therefore, you must periodically clear these logs through the Configuration/Setup Utility program (the menu choices are described in the “Using the Configuration/Setup Utility program” on page 16). When you are troubleshooting an error, be sure to clear both the logs so that you can find current errors more easily.

**Important:** After you complete a repair or correct an error, the system-error LED on the front of the serve is turned off if no other errors occurred.

Entries that are written to the system event/error log during the early phase of POST show an incorrect date and time as the default time stamp; however, the date and time are corrected as POST continues.

Each system event/error log entry is on its own page. To move from one entry to the next, use the Up Arrow and Down Arrow keys.

You can view the contents of the BMC system event log, and the system event/error log from the Configuration/Setup Utility program. If an optional Remote Supervisor Adapter II SlimLine is installed, you can also view the RSA II event/error log.

When you are troubleshooting PCI Express slots, note that the error logs report the PCI Express buses numerically. The numerical assignments vary depending on the configuration. You can check the assignments by running the Configuration/Setup Utility program (see “Using the Configuration/Setup Utility program” on page 16 for more information).

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

For complete information about using the Configuration/Setup Utility program, see “Using the Configuration/Setup Utility program” on page 16.

To view the error logs, complete the following steps:

1. Turn on the server.
2. When the prompt `Press F1 for Setup` is displayed, 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 **Event/Error Logs**, and then select **System Event/Error Log**.
   - To view the BMC system event log, select **Advanced Setup --> Baseboard Management Controller (BMC) Settings --> BMC System Event Log**
   - To view the combined system event/error log that is generated by the Remote Supervisor Adapter II SlimLine, select **Event/Error logs**, and then select **RSA II Event/Error Log**. This choice is available only if an optional Remote Supervisor Adapter II is installed.

### Clearing the error logs

For complete information about using the Configuration/Setup Utility program, see “Using the Configuration/Setup Utility program” on page 16.

To clear the error logs, complete the following steps:

1. Turn on the server.
2. When the prompt `Press F1 for Setup` is displayed, 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 clear the BMC system event log, select **Advanced Setup --> Baseboard Management Controller (BMC) Settings-->BMC System Event Log**. Select **Clear BMC SELs**; then, press Enter twice.
   - To clear the system event/error log, select **Event/Error Logs**, then select **System Event/Error Log**. Select **Clear system logs** to clear the system event/error log.
   - To clear the RSA II event/error log, select **Event/Error Logs**, and then select **RSA II Event/Error Log**. Select **Clear RSA II logs** to clear the RSA II event/error log.

## POST error codes

The following table describes the POST error codes and suggested actions to correct the detected 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, System x3350 Type 4192 and 4193 server,” on page 45 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 |
|---|---|---|
| 062 | Three consecutive boot failures using the default configuration. | 1. Run the Configuration/Setup Utility program, save the configuration, and restart the server.<br>2. Update the system firmware to the latest level (see “Updating the firmware” on page 15).<br>3. Reseat the following components, one at a time, in the order shown, restarting the server each time:<br>a. System-board battery<br>b. (Trained service technician only) Microprocessor<br>4. Replace the components listed in step 3, one at a time, in the order shown, restarting the server each time. |
| 101 | Tick timer interrupt failure. | (Trained service technician only) Replace the system board. |
| 102 | Internal timer channel 2 test failure | (Trained service technician only) Replace the system board. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 |
|---|---|---|
| 151 | Real-time clock error. | 1. Reseat the battery.<br>2. Clear CMOS. See "System-board switches and jumpers" on page 10 for information about how to clear CMOS.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. System-board battery<br>b. (Trained service technician only) System board |
| 162 | Device configuration error. | 1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.<br>2. Reseat the following components, one at a time, in the order shown, restarting the server each time:<br>a. System-board battery<br>b. Failing device (if the device is a FRU, the device must be reseated by a trained service technician only)<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. System-board battery<br>b. Failing device (if the device is a FRU, the device must be replaced by a trained service technician only)<br>c. (Trained service technician only) System board |
| 163 | Real-time clock error (time of day not set). | 1. Run the Configuration/Setup Utility program, select **Load Default Settings**, make sure that the date and time are correct, and save the settings.<br>2. Clear CMOS. See "System-board switches and jumpers" on page 10 for information about how to clear CMOS.<br>3. Reseat the battery.<br>4. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. System-board battery<br>b. (Trained service technician only) System board |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 |
|---|---|---|
| 164 | Memory configuration changed. | 1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.<br>2. Reseat the DIMMs.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. DIMMs<br>b. (Trained service technician only) System board |
| 175 | Service processor code on optional service processor adapter damaged or not installed. **Note:** In this case, the service processor is the optional Remote Supervisor Adapter II SlimLine. | 1. Update the firmware on the optional Remote Supervisor Adapter II SlimLine (see "Updating the firmware" on page 15).<br>2. Replace the optional Remote Supervisor Adapter II SlimLine. |
| 178 | System VPD not available. | 1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.<br>2. Update the firmware for the BMC.<br>3. (Trained service technician only) Replace the system board. |
| 184 | Power-on password damaged. | 1. Restart the server and enter the administrator password; then, run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.<br>2. Reseat the battery.<br>3. Clear CMOS memory. See "System-board switches and jumpers" on page 10 for information about how to clear CMOS memory.<br>4. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. System-board battery<br>b. (Trained service technician only) System board |
| 187 | VPD serial number not set. | 1. Update the firmware for the BMC.<br>2. (Trained service technician only) Replace the system board. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 |
|---|---|---|
| 188 | Bad VPD CRC #2. | 1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.<br>2. Update firmware for the BMC.<br>3. Update the Remote Supervisor Adapter II SlimLine firmware (if present).<br>4. (Trained service technician only) Replace the system board. |
| 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 system. | 1. Make sure that the DIMM is installed correctly (see "Installing a memory module (DIMM)" on page 75).<br>2. Replace the DIMM.<br>3. (Trained service technician only) Replace the system board. |
| 602 | Invalid diskette boot record | 1. Replace the diskette.<br>2. Reseat the diskette drive cables.<br>3. Replace the diskette drive. |
| 1162 | Serial port configuration error. | 1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.<br>2. (Trained service technician only) Replace the system board. |
| 1600 | BMC failed BIST. | 1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.<br>2. Update firmware for the BMC.<br>3. (Trained service technician only) Replace the system board. |
| 1601 | BMC is not functioning. | 1. Update firmware for the BMC.<br>2. (Trained service technician only) Replace the system board. |
| 1603 | Remote Supervisor Adapter II SlimLine is not responding. | Update firmware for the Remote Supervisor Adapter II SlimLine. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 |
|---|---|---|
| 1762 | Hard drive configuration error. | 1. Run the hard disk drive diagnostics tests on drive x.<br>2. Reseat the following components:<br>a. Hard disk drive<br>b. Hard disk drive backplane cable or backplate cables<br>3. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.<br>4. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Hard disk drive<br>b. Hard disk drive backplate<br>c. (Trained service technician only) System board |
| 178x | Hard drive error.<br>**Note:** x is the drive that has the error. | 1. Run the hard disk drive diagnostics tests on drive x.<br>2. Reseat the following components:<br>a. Hard disk drive<br>b. Hard disk drive backplane cable or backplate cables<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Hard disk drive<br>b. Hard disk drive backplate<br>c. (Trained service technician only) System board |
| 1800 | Unavailable PCI hardware interrupt. | 1. Run the Configuration/Setup Utility program and adjust the adapter settings.<br>2. Remove each adapter one at a time, restarting the server each time, until the problem is isolated. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 |
|---|---|---|
| 1801 | An adapter has requested memory resources that are not available. | 1. Run the Configuration/Setup Utility program and verify that sufficient memory is installed in the server.<br>2. Run the Configuration/Setup Utility program and disable some other resources to make more space available.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Each adapter<br>b. (Trained service technician only) System board |
| 1802 | No more I/O space is available for a PCI adapter. | 1. If the error code indicates a particular PCI or PCI Express slot or device, remove that device.<br>2. Reseat each adapter.<br>**Note:** If an error LED is lit 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.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Failing adapter<br>b. (Trained service technician only) System board |
| 1803 | A PCI adapter has requested memory above 1 MB, but no memory is available. | 1. If the error code indicates a particular PCI or PCI Express slot or device, remove the device<br>2. Reseat each adapter.<br>**Note:** If an error LED is lit 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.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Failing adapter<br>b. (Trained service technician only) System board |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 |
|---|---|---|
| 1804 | A PCI adapter has requested memory below 1 MB but no memory is available. | 1. If the error code indicates a particular PCI or PCI Express slot or device, remove the device<br>2. Reseat each adapter.<br>**Note:** If an error LED is lit 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.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Failing adapter<br>b. (Trained service technician only) System board |
| 1805 | A PCI option ROM checksum error occurred. | 1. Remove the failing adapter.<br>2. Reseat each adapter.<br>**Note:** If an error LED is lit 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.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Failing adapter<br>b. (Trained service technician only) System board |
| 1806 | A PCI built-in self-test failure occurred | 1. Remove the failing adapter.<br>2. Reseat each adapter.<br>**Note:** If an error LED is lit 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.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Failing adapter<br>b. (Trained service technician only) System board |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 |
|---|---|---|
| 1807 | A system board PCI device did not respond or has been disabled by user. | 1. Run the configuration/Setup Utility program, select **Devices and I/O Ports**, and make sure that the device is enabled.<br>2. Reseat each adapter.<br>**Note:** If an error LED is lit 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.<br>3. (Trained service technician only) Replace the system board |
| 1962 | A hard disk drive does not contain a valid boot sector. | 1. Run the Configuration/Setup Utility program, select **Load Default Settings** and save the settings.<br>2. Make sure that a startable operating system is installed.<br>3. Run the hard disk drive diagnostic tests.<br>4. Reseat the following components:<br>a. Hard disk drive<br>b. Hard disk drive backplane cable or backplate cables<br>5. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. (Hot-swap models) Hard disk drive cables<br>b. Hard disk drive<br>c. Hard disk drive backplane or backplate<br>d. (Trained service technician only) System board |
| 2462 | Video configuration error. | 1. (Trained service technician) Reseat the system board.<br>2. (Trained service technician only) Replace the system board. |
| 3001 | SMART failure predicted on hard disk drive. | Replace the hard disk drive. |
| 3003 | SMART command execution failure on hard disk drive. | Replace the hard disk drive. |
| 3005 | Current hard disk configuration doesn't support SMART function. | Replace the hard disk drive. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 |
|---|---|---|
| 5962 | Internal CD/DVD-ROM configuration changed. | 1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.<br>2. Reseat the following components:<br>a. CD-RW/DVD drive<br>b. CD-RW/DVD drive cable<br>c. System-board battery<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. CD-RW/DVD drive<br>b. CD-RW/DVD drive cable<br>c. System-board battery<br>d. (Trained service technician only) System board |
| 00012000 | Microprocessor machine check error. | 1. (Trained service technician only) Reseat the microprocessor.<br>2. (Trained service technician only) Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Microprocessor<br>b. System board |
| 00019701 | Microprocessor failed BIST. | 1. (Trained service technician only) Reseat the microprocessor.<br>2. (Trained service technician only) Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Microprocessor<br>b. System board |
| 01298001 | No update data for microprocessor. | 1. Update the BIOS code again (see "Recovering from a BIOS update failure" on page 208).<br>2. (Trained service technician only) Replace the microprocessor. |
| 01298101 | Bad update data for microprocessor 1. | 1. Update the BIOS code again (see "Recovering from a BIOS update failure" on page 208).<br>2. (Trained service technician only) Replace microprocessor 1. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 |
|---|---|---|
| I9990301 | Hard disk drive boot sector error. | 1. Reseat the following components:<br>a. Hard disk drive<br>b. Hard disk drive backplane cable or backplate cables<br>2. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Hard disk drive backplane cable or backplate cables<br>b. Hard disk drive<br>c. Hard disk drive backplane or backplate<br>d. (Trained service technician only) System board |
| I9990650 | AC power has been restored. | 1. Check the power cables.<br>2. Check for interruption of the ac power supply. |

## Checkout procedure

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

## About the checkout procedure

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

- Read the safety information that begins on page vii.
- The diagnostic programs provide the primary methods of testing the major components of the server, such as the system 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 diagnostic programs to confirm that the hardware is working correctly.
- When you run the diagnostic programs, a single problem might cause more than one error message. When this happens, correct the cause of the first error message. The other error messages usually will not occur the next time you run the diagnostic programs.

  **Exception:** If multiple error codes or light path diagnostics LEDs indicate a microprocessor error, the error might be in the microprocessor or in the microprocessor socket. See “Microprocessor problems” on page 134 for information about diagnosing microprocessor problems.
- Before you run the diagnostic programs, you must determine whether the failing server is part of a shared hard disk drive cluster (two or more servers sharing external storage devices). If it is part of a cluster, you can run all diagnostic programs except the ones that test the storage unit (that is, a hard disk drive in the storage unit) or the storage adapter that is attached to the storage unit. The failing server might be part of a cluster if any of the following conditions is true:
  - 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.
- If the server is halted and a POST error code is displayed, see “Error logs” on page 116. If the server is halted and no error message is displayed, see “Troubleshooting tables” on page 129 and “Solving undetermined problems” on page 216.
- For information about power-supply problems, see “Solving power problems” on page 215.
- For intermittent problems, check the error log; see “Error logs” on page 116 and “Diagnostic programs and messages” on page 148.

## Performing the checkout procedure

To perform the checkout procedure, complete the following steps:

1. Is the server part of a cluster?
   - **No:** Go to step 3.
   - **Yes:** Shut down all failing servers that are related to the cluster. Go to step 3.
2. Check the system-error LED on the operator information panel. If it is flashing, check the light path diagnostics LEDs (see “Light path diagnostics” on page 142).
3. Complete the following steps:
   a. Check the power-supply LEDs, see “Power-supply LEDs” on page 147.
   b. Turn off the server and all external devices.
   c. Check all internal and external devices for compatibility at http://www.ibm.com/servers/eserver/serverproven/compat/us/.
   d. Make sure that the server is cabled correctly.
   e. Check all cables and power cords.
   f. Set all display controls to the middle positions.
   g. Turn on all external devices.
   h. Turn on the server. If the server does not start, see “Troubleshooting tables” on page 129.
   i. Check the system-error LED on the operator information panel. If it is flashing, check the light path diagnostics LEDs (see “Light path diagnostics” on page 142).
   j. Check for the following results:
      - Successful completion of POST, which is indicated by a single beep
      - Successful completion of startup which is indicated by a readable display of the operating-system desktop
4. Did a single beep sound and are there readable instructions on the main menu?
   - **No:** Find the failure symptom in “Troubleshooting tables” on page 129; if necessary, see “Solving undetermined problems” on page 216
   - **Yes:** Run the diagnostic programs ( See “Running the diagnostic programs” on page 149).
     – If you receive an error, follow the instructions.
     – If the diagnostic programs were completed successfully and you still suspect a problem, see “Solving undetermined problems” on page 216

     Find the beep code in “POST beep codes” on page 112; if necessary, see “Solving undetermined problems” on page 216.

## Troubleshooting tables

Use the troubleshooting tables to find solutions to problems that have identifiable symptoms.

If you cannot find a problem in these tables, see “Running the diagnostic programs” on page 149 for information about testing the server.

If you have just added new software or a new optional device and the server is not working, complete the following steps before you use the troubleshooting tables:

1. Check the light path diagnostics LEDs on the operator information panel (see “Light path diagnostics” on page 142).
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

- **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, System x3350 Type 4192 and 4193 server,” on page 45 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 CD or DVD drive is not recognized. | 1. Make sure that:<br>• All cables and jumpers are installed correctly.<br>• The correct device drive is installed for the CD or DVD drive.<br>• The signal cable and connector are not damaged and the connector pins are not bent.<br>• All damaged parts are repaired or replaced.<br>• The correct device driver is installed for the CD-or DVD drive.<br>2. Run the CD or DVD drive diagnostic programs.<br>3. Reseat the following components:<br>a. CD-RW/DVD drive<br>b. CD-RW/DVD drive cable<br>4. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. CD or DVD drive<br>b. CD or DVD drive cable<br>c. (Trained service technician only) System board |
| The CD or DVD is not working correctly. | 1. Clean the CD or DVD drive.<br>2. Run the CD or DVD drive diagnostic programs<br>3. Reseat the CD or DVD drive.<br>4. Replace the CD or DVD drive. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 CD or DVD drive tray is not working. | 1. Make sure that the server is turned on.<br>2. Insert the end of a straightened paper clip into the manual tray-release opening.<br>3. Reseat the CD or DVD drive cable.<br>4. Replace the CD or DVD drive. |

## General 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, System x3350 Type 4192 and 4193 server," on page 45 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 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

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 |
|---|---|
| Not all drives are recognized by the hard disk drive diagnostic test. | Remove the drive that is indicated by 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. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 hard disk drive passes the diagnostic Fixed Disk Test, but the problem remains. | Run the diagnostic for SCSI Attached Disks (see "Running the diagnostic programs" on page 149).<br>**Note:** This test is not available on servers that have RAID arrays or servers that have IDE or SATA hard disk drives. |

## Intermittent 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, System x3350 Type 4192 and 4193 server," on page 45 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 problem occurs only occasionally and is difficult to diagnose. | 1. Make sure that:<br>• All cables and cords are connected securely to the rear of the server and attached devices.<br>• 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.<br>2. Check the system event/error log or BMC system event log (see "Error logs" on page 116). |
| The server resets (restarts) occasionally. | 1. If the reset occurs during POST and the POST watchdog timer is enabled (click **Advanced Setup --> Baseboard Management Controller (BMC) Settings --> BMC Post Watchdog** in the Configuration/Setup Utility program to see the POST watchdog setting), make sure that sufficient time is allowed in the watchdog timeout value (**BMC POST Watchdog Timeout**). See the "Using the Configuration/Setup Utility program" on page 16 for information about the settings in the Configuration/Setup Utility program. If the server continues to reset during POST, see "POST" on page 111 and "Diagnostic programs and messages" on page 148.<br>2. If the reset occurs after the operating system starts, disable any automatic server restart (ASR) utilities, such as the IBM Automatic Server Restart IPMI Application for Windows, or ASR devices that are installed.<br>**Note:** ASR utilities operate as operating-system utilities and are related to the IPMI device driver.<br>If the reset continues to occur after the operating system starts, the operating system might have a problem; see "Software problems" on page 141.<br>3. If neither condition applies, check the system event/error log or BMC system event log (see "Error logs" on page 116). |

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

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See the parts listing in the *Problem Determination and Service Guide* on the IBM *System x Documentation* CD 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 |
|---|---|
| All or some keys on the keyboard do not work. | 1. Make sure that:<br>• The keyboard cable is securely connected.<br>• The server and the monitor are turned on.<br>2. If you are using a USB keyboard and it is connected to a USB hub, disconnect the keyboard from the hub and connect it directly to the server.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Keyboard<br>b. (Trained service technician only) System board |
| The mouse or pointing device does not work. | 1. Make sure that:<br>• The mouse or pointing-device cable is securely connected to the server.<br>• The mouse or pointing-device drivers are installed correctly.<br>• The server and the monitor are turned on.<br>• The mouse operation has been enabled in the Configuration/Setup Utility program.<br>2. If you are using a USB mouse or pointing device and it is connected to a USB hub, disconnect the mouse or pointing device from the hub and connect it directly to the server.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Mouse or pointing device<br>b. (Trained service technician only) System board |

## 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, System x3350 Type 4192 and 4193 server," on page 45 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 amount of system memory that is displayed is less than the amount of installed physical memory. | 1. Make sure that:<br>• No error LEDs are lit on the front panel assembly or on the system board.<br>• The memory modules are seated correctly.<br>• You have installed the correct type of memory. See "Installing a memory module (DIMM)" on page 75.<br>• All DIMMs are enabled. The server might have automatically disabled a memory DIMM when it detected a problem.<br>• If a DIMM was disabled by a systems-management interrupt (SMI), replace the DIMM.<br>2. Check the POST error log for error message 289. If POST error message 289 is in the error log, perform the actions listed in the POST error codes table (see "POST error codes" on page 117). Otherwise, continue to step 3.<br>3. Run memory diagnostics (see "Running the diagnostic programs" on page 149).<br>4. Make sure that there is no memory mismatch when the server is at the minimum memory configuration (two 512 MB DIMMs; see the information about the minimum required configuration on page 75).<br>5. Add one pair of DIMMs at a time, making sure that the DIMMs in each pair match.<br>6. Reseat the DIMMs. See "Installing a memory module (DIMM)" on page 75.<br>7. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. DIMMs<br>b. (Trained service technician only) System board |

## 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, System x3350 Type 4192 and 4193 server," on page 45 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 microprocessor is not working correctly. | 1. Correct any errors that are indicated by the light path diagnostics LEDs (see "Light path diagnostics" on page 142).<br>2. Make sure that the server supports the microprocessor.<br>3. (Trained service technician only) Reseat the microprocessor.<br>4. (Trained service technician only) Replace the following components, in the order shown, restarting the server each time:<br>a. Microprocessor<br>b. (Trained service technician only) System board |

## 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.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See the parts listing in the *Problem Determination and Service Guide* on the IBM *System x Documentation* CD 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 | 1. Make sure that the monitor cables are firmly connected.<br>2. Try using a different monitor on the server, or try testing the monitor on a different server.<br>3. Run the diagnostic programs (see "Running the diagnostic programs" on page 149). If the monitor passes the diagnostic programs, the problem might be a video device driver.<br>4. Reseat the Remote Supervisor Adapter II SlimLine (if one is installed).<br>5. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Remote Supervisor Adapter II SlimLine (if one is installed)<br>b. (Trained service technician only) System board |
| The screen is blank. | 1. If the server is attached to a KVM switch, bypass the KVM switch to eliminate it as a possible cause of the problem: connect the monitor cable directly to the correct connector on the rear of the server.<br>2. Make sure that:<br>• The server is turned on. If there is no power to the server, see "Power problems" on page 138.<br>• The monitor cables are connected correctly.<br>• The monitor is turned on and the brightness and contrast controls are adjusted correctly.<br>• No beep codes sound when the server is turned on.<br>**Important:** 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 **Boot Fail Count** option in the **Start Options** 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).<br>3. Make sure that the correct server is controlling the monitor, if applicable.<br>4. Make sure that damaged BIOS code is not affecting the video; see "Recovering from a BIOS failure" in the *Problem Determination and Service Guide*.<br>5. See "Solving undetermined problems" on page 216. |

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See the parts listing in the *Problem Determination and Service Guide* on the IBM *System x Documentation* CD 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 works when you turn on the server, but the screen goes blank when you start some application programs. | 1. Make sure that:<br>• The application program is not setting a display mode that is higher than the capability of the monitor.<br>• You installed the necessary device drivers for the application.<br>2. Run video diagnostics (see "Running the diagnostic programs" on page 149 for information about running the diagnostic programs).<br>• If the server passes the video diagnostics, the video is good; see "Running the diagnostic programs" on page 149 for information about solving undetermined problems.<br>• (Trained service technician only) If the server fails the video diagnostics, replace the system board. |
| The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted. | 1. If the monitor self-tests show that 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.<br>**Attention:** Moving a color monitor while it is turned on might cause screen discoloration.<br>Move the device and the monitor at least 305 mm (12 in.) apart, and turn on the monitor.<br>**Notes:**<br>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.).<br>b. Non-IBM monitor cables might cause unpredictable problems.<br>2. Reseat the following components:<br>a. Monitor<br>b. Remote Supervisor Adapter II SlimLine (if one is installed)<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Monitor<br>b. Remote Supervisor Adapter II SlimLine (if one is installed)<br>c. (Trained service technician only) System board |
| Wrong characters appear on the screen. | 1. If the wrong language is displayed, update the BIOS code with the correct language.<br>2. Reseat the monitor cable.<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Monitor<br>b. (Trained service technician only) System board |

## Optional-device problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See the parts listing in the *Problem Determination and Service Guide* on the IBM *System x Documentation* CD 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 |
|---|---|
| An IBM optional device that was just installed does not work. | 1. Make sure that:<br>• The device is designed for the server (see http://www.ibm.com/servers/eserver/serverproven/compat/us/).<br>• You followed the installation instructions that came with the device and the device is installed correctly.<br>• You have not loosened any other installed devices or cables.<br>• You updated the configuration information in the Configuration/Setup Utility program. Whenever a device is changed, you must update the configuration.<br>2. Reseat the device that you just installed.<br>3. Replace the device that you just installed. |
| An IBM optional device that worked previously does not work now. | 1. Make sure that all of the cable connections for the device are secure.<br>2. If the device comes with test instructions, use those instructions to test the device.<br>3. Reseat the failing device.<br>4. Replace the failing device. |

## Power problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See the parts listing in the *Problem Determination and Service Guide* on the IBM *System x Documentation* CD 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 power-control button does not work, and the reset button does work (the server does not start).<br>**Note:** The power-control button will not function until 20 seconds after the server has been connected to ac power. | 1. Make sure that the power-control button is working correctly:<br>a. Disconnect the server power cords.<br>b. Reconnect the power cords.<br>c. (Trained service technician only) Reseat the operator information panel cable, and then repeat steps 1a and 1b.<br>d. (Trained service technician only) If the server starts, reseat the operator information panel. If the problem remains, replace the operator information panel.<br>2. Make sure that the reset button is working correctly:<br>a. Disconnect the server power cords.<br>b. Reconnect the power cords.<br>c. (Trained service technician only) Reseat the operator information panel cable, and then repeat steps 2a and 2b.<br>• (Trained service technician only) If the server starts, replace the operator information panel.<br>• If the server does not start, go to step 3.<br>3. Make sure that:<br>• The power cords are correctly connected to the server and to a working electrical outlet.<br>• The type of memory that is installed is correct.<br>• The DIMMs are fully seated.<br>• The LEDs on the power supply do not indicate a problem.<br>• (Trained service technician only) The microprocessor is correctly installed.<br>4. If you just installed an optional device, remove it, and restart the server. If the server now starts, you might have installed more devices than the power supply supports.<br>5. Reseat the following components:<br>a. DIMMs<br>b. (Trained service technician only) Power backplane<br>6. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. DIMMs<br>b. Power supply<br>c. (Trained service technician only) Power backplane<br>d. (Trained service technician only) System board<br>7. See "Solving undetermined problems" on page 216. |

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See the parts listing in the *Problem Determination and Service Guide* on the IBM *System x Documentation* CD 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 does not turn off. | 1. Determine whether you are using an Advanced Configuration and Power Interface (ACPI) or a non-ACPI operating system. If you are using a non-ACPI operating system, complete the following steps:<br>a. Press Ctrl+Alt+Delete.<br>b. Turn off the server by pressing the power-control button for 5 seconds.<br>c. Restart the server.<br>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.<br>2. If the problem remains or if you are using an ACPI-aware operating system, suspect the system board. |
| The server unexpectedly shuts down, and the LEDs on the operator information panel are not lit. | See "Solving undetermined problems" on page 216. |

## Serial device 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, System x3350 Type 4192 and 4193 server," on page 45 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 number of serial ports that are identified by the operating system is less than the number of installed serial ports. | 1. Make sure that:<br>• The port is assigned a unique address in the Configuration/Setup Utility program and is not disabled.<br>• The serial-port adapter (if one is present) is seated correctly.<br>2. Reseat the serial port adapter.<br>3. Replace the serial port adapter. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 serial device does not work. | 1. Make sure that:<br>• The device is compatible with the server.<br>• The serial port is enabled and is assigned a unique address.<br>• The device is connected to the correct connector (see "Internal LEDs, connectors, and jumpers" on page 8).<br>2. Reseat the following components:<br>a. Failing serial device<br>b. Serial cable<br>c. Remote Supervisor Adapter II SlimLine (if one is present)<br>3. Replace the following components one at a time, in the order shown, restarting the server each time:<br>a. Failing serial device<br>b. Serial cable<br>c. Remote Supervisor Adapter II SlimLine (if one is present)<br>d. (Trained service technician only) System board |

## ServerGuide 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, System x3350 Type 4192 and 4193 server," on page 45 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 *ServerGuide Setup and Installation* CD will not start. | 1. Make sure that the server supports the ServerGuide program and has a startable (bootable) CD or DVD drive.<br>2. If the startup (boot) sequence settings have been changed, make sure that the CD or DVD drive is first in the startup sequence.<br>3. 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. |
| The ServeRAID Manager program cannot view all installed drives, or the operating system cannot be installed. | 1. Make sure that the hard disk drive is connected correctly.<br>2. Make sure that the hard disk drive cables are securely connected. |
| 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 *ServerGuide Setup and Installation* CD label for a list of supported operating-system versions. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 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 servers), or the ServerGuide System Partition is not present. Run the ServerGuide program and make sure that setup is complete. |

## Software 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, System x3350 Type 4192 and 4193 server," on page 45 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 |
|---|---|
| You suspect a software problem. | 1. To determine whether the problem is caused by the software, make sure that:<br>• The server has the minimum memory that is needed to use the software. For memory requirements, see the information that comes with the software. If you have just installed an adapter or memory, the server might have a memory-address conflict.<br>• The software is designed to operate on the server.<br>• Other software works on the server.<br>• The software works on another server.<br>2. If you receive any error messages while you use the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem.<br>3. Contact your place of purchase of the software. |

## Universal Serial Bus (USB) device 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, System x3350 Type 4192 and 4193 server," on page 45 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. | 1. Make sure that:<br>• The correct USB device driver is installed.<br>• The operating system supports USB devices.<br>2. Make sure that the USB configuration options are set correctly in the Configuration/Setup Utility program (see "Using the Configuration/Setup Utility program" on page 16CD for more information).<br>3. If you are using an external USB hub, disconnect the USB device from the hub and connect it directly to the server. |

## Video problems

See "Monitor problems" on page 135.

## Light path diagnostics

Light path diagnostics is a system of LEDs on various external and internal components of the server. When an error occurs, LEDs are lit throughout the server. By viewing the LEDs in a particular order, you can often identify the source of the error.

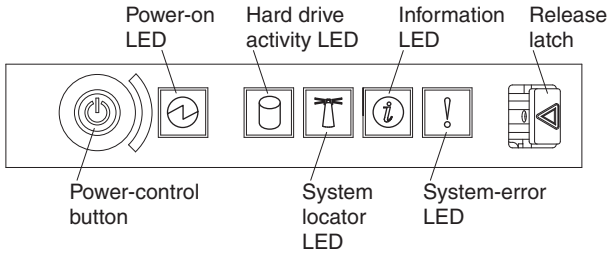
When LEDs are lit to indicate an error, they remain lit when the server is turned off, provided that the server is still connected to power and the power supply is operating correctly.

Before working inside the server to view light path diagnostics LEDs, read the safety information that begins on page vii and "Handling static-sensitive devices" on page 55.

If an error occurs, view the light path diagnostics LEDs in the following order:

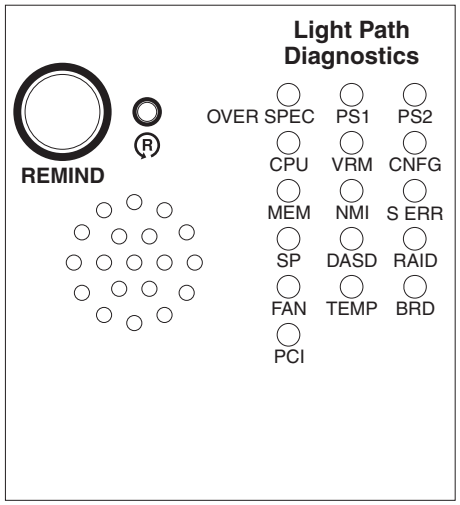
1. Look at the operator information panel on the front of the server.
   - If the information LED is lit, it indicates that information about a suboptimal condition in the server is available in the BMC system event log or in the system event/error log.
   - If the system-error LED is lit, it indicates that an error has occurred; go to step 2 on page 143.

   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 light path 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.

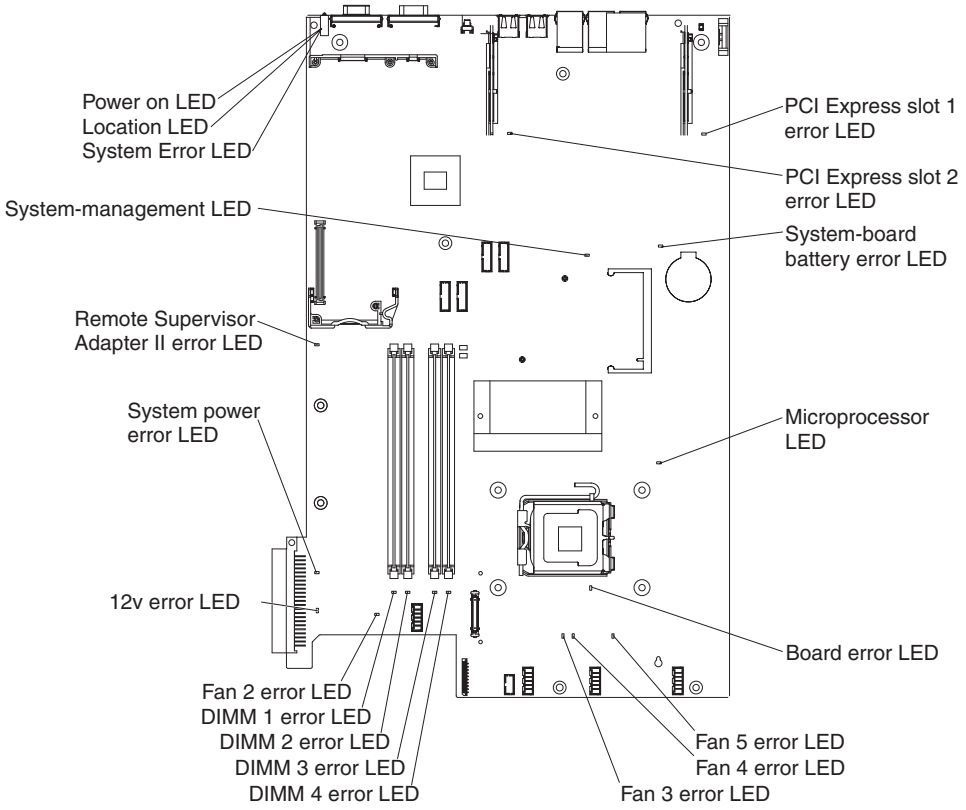
   The following illustration shows the light path diagnostics panel.




   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 diagnostics LEDs” on page 144 can often provide enough information to diagnose the error.

3. Remove the server cover and look inside the server for lit LEDs. A lit LED on or beside a component identifies the component that is causing the error.

   The following illustration shows the LEDs on the system board.




## Remind button

You can use the remind button on the light path diagnostics panel 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 and stays in Remind mode until one of the following conditions occurs:

- All known errors are corrected.
- The server is restarted.
- A new error occurs, causing the system-error LED to be lit again.

## Light path diagnostics LEDs

The following table describes the LEDs on the light path diagnostics panel and suggested actions to correct the detected problems.

**Note:** Check the system event/error log or BMC system event log for additional information before you replace a FRU.

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 information LED also lit | Description | Action |
|---|---|---|
| None | An error has occurred and cannot be diagnosed, or the Advanced System Management (ASM) processor on the Remote Supervisor Adapter II SlimLine has failed. The error is not represented by a light path diagnostics LED. | Use the Configuration/Setup Utility program to check the system event/error log for information about the error. |
| OVER SPEC | The power supplies or power backplane are using more power than their maximum rating allows. | 1. Remove optional devices from the server.<br>2. Replace the failing power supply.<br>3. If the 12V error LED is lit, reseat the power backplane. If the problem remains, replace the power backplane. |
| PS1 | The power supply in bay 1 has failed or has been removed. | 1. Make sure that the power supply is correctly seated.<br>2. Replace the failed power supply. |
| PS2 | The power supply in bay 2 has failed or has been removed. | 1. Make sure that the power supply is correctly seated.<br>2. Replace the failed power supply. |
| CPU | The microprocessor has failed. | 1. Check the BMC system event log or the system event/error log to determine the reason for the lit LED.<br>2. (Trained service technician only) Reseat the microprocessor.<br>3. (Trained service technician only) Replace the microprocessor. |
| VRM | Reserved. | Reserved. |
| CNFG | A microprocessor configuration error has occurred. | 1. Check the microprocessor options for compatibility.<br>2. Check the system event/error log for information indicating incompatible components.<br>3. (Trained service technician only) Replace an incompatible microprocessor. |
| MEM | A memory error has occurred. | Replace the failing DIMM, which is indicated by the lit LED on the system board. |
| NMI | A non-maskable interrupt error has occurred. | Check the system event/error log for information about the error. (Use the Configuration/Setup Utility program to view the error logs.) |
| S ERR | Reserved | 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, System x3350 Type 4192 and 4193 server," on page 45 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 information LED also lit | Description | Action |
|---|---|---|
| SP | The service processor has failed. | 1. Remove ac power from the server; then, reconnect the server to ac power and restart the server.<br>2. Update the firmware on the BMC.<br>3. If a Remote Supervisor Adapter II SlimLine is installed update the firmware. If the problem remains, replace the adapter.<br>4. (Trained service technician only) Replace the system board. |
| DASD | A hard disk drive error has occurred. | 1. Check the LEDs on the hard disk drives and replace the indicated drive.<br>2. Replace the hard disk drive backplane or backplate. |
| BRD | An error has occurred with the system board voltage over range or a battery fault. | • Check the LEDs on the system board to identify the component that is causing the error.<br>• Check the system event/error log for information about the error. (Use the Configuration/Setup Utility program to view the error logs.) |
| FAN | A fan has failed, is operating too slowly, or has been removed. A failing fan can also cause the TEMP LED to be lit. | Replace the failing fan, which is indicated by a lit LED near the fan connector on the system board. |
| TEMP | The system temperature has exceeded the maximum threshold level. A failing fan can cause the TEMP LED to be lit. | • Determine whether a fan has failed. If it has, replace it.<br>• Make sure that the room temperature is not too high. See "Features and specifications" on page 3 for temperature information.<br>• Make sure that the air vents are not blocked. |
| RAID | Reserved | Reserved |

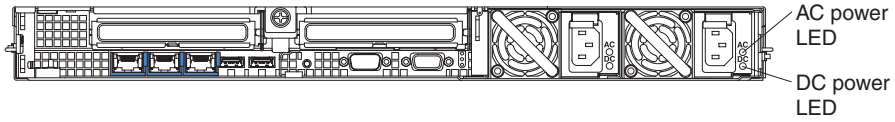
| | | |
|---|---|---|
| • **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**<br>• **See Chapter 3, "Parts listing, System x3350 Type 4192 and 4193 server," on page 45 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**<br>• **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 information LED also lit** | **Description** | **Action** |
| PCI | An error has occurred on a PCI bus or on the system board. An additional LED will be lit next to a failing PCI slot. | 1. Check the LEDs at the PCI slots to identify the component that is causing the error.<br>2. Make sure that the PCI riser card assemblies are seated correctly.<br>3. Check the system event/error log for information about the error. (Use the Configuration/Setup Utility program to view the error logs.)<br>4. If you cannot isolate the failing adapter through the LEDs and the information in the system event/error log, remove one adapter at a time from the failing PCI bus, and restart the server after each adapter is removed.<br>5. Replace the following components, in the order shown, restarting the server each time:<br>• PCI riser card<br>• (Trained service technician only) System board |

## Power-supply LEDs

The following minimum configuration is required for the DC LED on the power supply to be lit:
- Power supply
- Power backplane
- Power cord

The following minimum configuration is required for the server to start:
- The microprocessor
- Two 512 MB DIMMs on the system board
- One power supply
- Power backplane
- Power cord
- Four cooling fans

The following illustration shows the locations of the power-supply LEDs.



The following table describes the problems that are indicated by various combinations of the power-supply LEDs and the power-on LED on the operator information panel and suggested actions to correct the detected 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, System x3350 Type 4192 and 4193 server," on page 45 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-on LED | Description | Action |
|---|---|---|---|---|
| AC | DC | | | |
| Off | Off | Off | No power to the server, or a problem with the ac power source. | 1. Check the ac power to the server.<br>2. Make sure that the power cord is connected to a functioning power source.<br>3. Remove one power supply at a time. |
| Lit | Off | Off | DC source power problem. | 1. Remove one power supply at a time.<br>2. View the system event/error log (see "Error logs" on page 116). |
| Lit | Lit | Off | Standby power problem. | 1. View the system event/error log (see "Error logs" on page 116).<br>2. Remove one power supply at a time.<br>3. (Trained service technician only) Replace the power backplane. |
| Lit | Lit | Lit | The power is good. | The server is powered-on. No action is necessary. |

## Diagnostic programs and messages

The Dynamic System Analysis (DSA) Preboot diagnostic programs are the primary method of testing the major components of the server. DSA is a system information collection and analysis tool that you can use to provide information IBM service and support to aid in the diagnosis of the system problems. The DSA diagnostic programs come on the IBM *Dynamic System Analysis Preboot Diagnostic* CD. You can download the CD from http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSAif one did not come with your server. As you run the diagnostic programs, text messages are displayed on the screen and are saved in the test log. A diagnostic text message indicates that a problem has been detected and indicates the action you should take as a result of the text message.

The DSA diagnostic programs collect the following information about the following aspects of the system:

- System configuration
- Network interfaces and settings
- Hardware inventory including PCI and USB information
- IBM light path diagnostics status
- Service processor status and configuration

- Vital product data, firmware, and basic input/output system (BIOS)
- Drive health information
- LSI RAID and controller configuration

The DSA diagnostic programs can also provide diagnostics for the following system components, if they are installed in the system:

- BroadCom Ethernet controller
- Optical (CD or DVD) drives
- Hard disk drives
- LSI 1064e/1078e SAS RAID controller
- Remote Supervisor Adapter
- Baseboard management controller
- Memory
- Microprocessor

The diagnostic programs create a merged log, called the DSA error log, that includes events from all collected logs. You can output all of the collected XML file that you can send to the IBM service and support, view the information locally through a generated text report file, or copy the log to a removable media and view the log from a Web browser. See “Running the diagnostic programs” for more information.

Make sure that the latest version of the diagnostic programs is installed. To download the latest version of the diagnostic programs complete the following steps:

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. Under **Product support**, click **System x**.
3. Under popular links, click **Software and device drivers**.
4. Click **Dynamic System Analysis (DSA)**.

For additional information about tools for updating, managing, and deploying firmware, see the System x and xSeries Tools Center at http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp.

## Running the diagnostic programs

**Important:**The DSA diagnostic programs do not support USB CD-ROM drives. If you run the DSA diagnostic programs while any USB CD-ROM drives are attached, ignore any optical drive test results that are returned for USB CD-ROM drives. You can also remove USB CD-ROM drives before you run the DSA diagnostic programs to get accurate optical drive test results. To remove a remotely mounted USB CD-ROM drive, you might have to unmount the remote disk through the Remote Supervisor Adapter II Web interface.

To run the DSA Preboot 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 `Press F1 for Configuration/Setup` is displayed, press F1.
4. From the Configuration/Setup Utility menu, select **Start Options**.

5. From the **Start Options** menu, select **Startup Sequence Options**.
6. Note the device that is selected as the first startup device. Later, you must restore this setting.
7. Select **CD-ROM** as the first startup device.
8. Press Esc twice to return to the Configuration/Setup Utility menu.
9. Insert the IBM *Dynamic System Analysis Pre-Boot Diagnostics* CD into the CD or DVD drive.
10. Select **Save & Exit Setup** and follow the prompts. The diagnostic programs start.
11. From the diagnostic programs screen, select the test that you want to run and follow the instructions on the screen.

Follow the actions in the “Diagnostic messages” on page 151 to solve the problem.

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.

A single problem might cause more than one error message. When this happens, correct the cause of the first error message. The other error messages usually will not occur the next time you run the diagnostic programs.

**Exception:** If multiple error messages or LEDs indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 134 for information about diagnosing microprocessor problems.

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.

## 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.

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

## Viewing the test log

You can use one of the following methods to access the test log when the tests are completed:

- From the DSA command line, issue the DSA CLI **View** command or select the **Diagnostic Event Log** option from the DSA graphical user interface (GUI
- From the DSA interactive menu, select the **getextendedresults** option.
- From the DSA interactive menu, select the **View** option to view all of the collected results and error log data.
- In the DSA GUI, select **DSA Error Log** from the System Information page.

You can send the DSA error log file to IBM service and support to aid in diagnosing the server problems or you can use the DSA CLI **copy** command to copy the log to an external USB device.

## Diagnostic messages

The following table describes the messages that the diagnostic programs might generate and suggested actions to correct the detected problems. Follow the suggested actions in the order in which they are listed in the action column.

**Important:**The DSA diagnostic programs do not support USB CD-ROM drives. If you run the DSA diagnostic programs while any USB CD-ROM drives are attached, ignore any optical drive test results that are returned for USB CD-ROM drives. You can also remove USB CD-ROM drives before you run the DSA diagnostic programs to get accurate optical drive test results. To remove a remotely mounted USB CD-ROM drive, you might have to unmount the remote disk through the Remote Supervisor Adapter II Web interface.

*Table 7. DSA diagnostic messages*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 089-801-xxx | CPU | CPU Stress Test | Aborted | Internal program error. | 1. Turn off and restart the system.<br>2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>3. Run the test again.<br>4. Make sure that the system firmware is as the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>5. Run the test again.<br>6. If the system has stopped responding, turn off and restart the system.<br>7. Run the test again.<br>8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 089-802-xxx | CPU | CPU Stress Test | Aborted | System resource availability error. | 1. Turn off and restart the system.<br>2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>3. Run the test again.<br>4. Make sure that the system firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>5. Run the test again.<br>6. If the system has stopped responding, turn off and restart the system.<br>7. Run the test again.<br>8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 089-803-xxx | CPU | CPU Stress Test | Aborted | Memory size is insufficient to run the test. At least 1 GB is required. | 1. Turn off and restart the system.<br>2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>3. Run the test again.<br>4. Make sure that the system firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>5. Run the test again.<br>6. If the system has stopped responding, turn off and restart the system.<br>7. Run the test again.<br>8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 089-901-xxx | CPU | CPU Stress Test | Failed | Test failure. | 1. If the system has stopped responding, turn off and restart the system and then run the test again.<br>2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>3. Run the test again.<br>4. Make sure that the system firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>5. Run the test again.<br>6. If the system has stopped responding, turn off and restart the system.<br>7. Run the test again.<br>8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 165-801-xxx | Remote Supervisor Adapter | RSA Restart Test | Aborted | Remote Supervisor Adapter restart test failure with reason: no service processor was found. | 1. Make sure that **Linux** is selected in **Advanced Setup –> RSA II Settings –> OS USB Selection** in the Configuration/Setup Utility program (press F1 at system startup).<br>2. Make sure that the Remote Supervisor Adapter II SlimLine firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>4. Run the test again.<br>5. Turn off the system and disconnect it from the power source.<br>6. Reseat the Remote Supervisor Adapter II SlimLine.<br>7. Reconnect the system to the power source and turn on the system.<br>8. Run the test again.<br>9. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 165-902-xxx | Remote Supervisor Adapter | RSA Restart Test | Failed | Remote Supervisor Adapter restart test failure with reason: the Remote Supervisor Adapter restart command was not sent successfully. | 1. Make sure that **Linux** is selected in **Advanced Setup –> RSA II Settings –> OS USB Selection** in the Configuration/Setup Utility program (press F1 at system startup).<br>2. Make sure that the Remote Supervisor Adapter II SlimLine firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>4. Run the test again.<br>5. Turn off the system and disconnect it from the power source.<br>6. Reseat the Remote Supervisor Adapter II SlimLine.<br>7. Reconnect the system to the power source and turn on the system.<br>8. Run the test again.<br>9. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 165-903-xxx | Remote Supervisor Adapter | RSA Restart Test | Failed | Remote Supervisor Adapter restart test failure with reason: the Remote Supervisor Adapter did not restart. | 1. Make sure that **Linux** is selected in **Advanced Setup –> RSA II Settings –> OS USB Selection** in the Configuration/Setup Utility program (press F1 at system startup).<br>2. Make sure that the Remote Supervisor Adapter II SlimLine firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>4. Run the test again.<br>5. Turn off the system and disconnect it from the power source.<br>6. Reseat the Remote Supervisor Adapter II SlimLine.<br>7. Reconnect the system to the power source and turn on the system.<br>8. Run the test again.<br>9. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 165-904-xxx | Remote Supervisor Adapter | RSA Restart Test | Failed | Remote Supervisor Adapter restart test failure with reason: the Remote Supervisor Adapter cannot wake up from the restart process. | 1. Make sure that **Linux** is selected in **Advanced Setup –> RSA II Settings –> OS USB Selection** in the Configuration/Setup Utility program (press F1 at system startup).<br>2. Make sure that the Remote Supervisor Adapter II SlimLine firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>4. Run the test again.<br>5. Turn off the system and disconnect it from the power source.<br>6. Reseat the Remote Supervisor Adapter II SlimLine.<br>7. Reconnect the system to the power source and turn on the system.<br>8. Run the test again.<br>9. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 165-905-xxx | Remote Supervisor Adapter | RSA Restart Test | Failed | Remote Supervisor Adapter restart test failure with reason: cannot restart the Remote Supervisor Adapter because of no communication with the service processor. | 1. Make sure that **Linux** is selected in **Advanced Setup –> RSA II Settings –> OS USB Selection** in the Configuration/Setup Utility program (press F1 at system startup).<br>2. Make sure that the Remote Supervisor Adapter II SlimLine firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>4. Run the test again.<br>5. Turn off the system and disconnect it from the power source.<br>6. Reseat the Remote Supervisor Adapter II SlimLine.<br>7. Reconnect the system to the power source and turn on the system.<br>8. Run the test again.<br>9. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-801-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: the BMC returned an incorrect response length. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-802-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: the test cannot be completed for an unknown reason. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-803-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: the node is busy; try later. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-804-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: invalid command. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-805-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: invalid command for the given LUN. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-806-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: timeout while processing the command. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-807-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: out of space. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-808-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: reservation canceled or invalid reservation ID. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-809-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: request data was truncated. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-810-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: request data length is invalid. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-811-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: request data field length limit is exceeded. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-812-xxx | BMC | BMC I2C Test | Aborted | BMC I2C Test canceled a parameter is out of range. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-813-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: cannot return the number of requested data bytes. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-814-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: requested sensor, data, or record is not present. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-815-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: invalid data field in the request. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-816-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: the command is illegal for the specified sensor or record type. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-817-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: a command response could not be provided. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-818-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: cannot execute a duplicated request. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-819-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: a command response could not be provided; the SDR repository is in update mode. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-820-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: a command response could not be provided; the device is in firmware update mode. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-821-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: a command response could not be provided; BMC initialization is in progress. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-822-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: the destination is unavailable. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-823-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: cannot execute the command; insufficient privilege level. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-824-xxx | BMC | BMC I2C Test | Aborted | BMC I2C test canceled: cannot execute the command. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-901-xxx | BMC | BMC I2C Test | Failed | BMC indicates a failure in the IPMB bus | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. Remove power from the system.<br>8. (Trained service technician only) Reseat the system board.<br>9. Reconnect the system to power and turn on the system.<br>10. Run the test again.<br>11. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-902-xxx | BMC | BMC I2C Test | Failed | BMC indicates a failure in the sensor bus | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. Remove power from the system.<br>8. (Trained service technician only) Reseat the system board.<br>9. Reconnect the system to power and turn on the system.<br>10. Run the test again.<br>11. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-903-xxx | BMC | BMC I2C Test | Failed | The BMC indicates a failure in the Ethernet sideband bus. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Make sure that the Ethernet device firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>7. Run the test again.<br>8. Remove power from the system.<br>9. (Trained service technician only) Reseat the system board.<br>10. Reconnect the system to power and turn on the system.<br>11. Run the test again.<br>12. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-904-xxx | BMC | BMC I2C Test | Failed | The BMC indicates a failure in the power backplane bus. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. Remove power from the system.<br>8. Reseat the power backplane.<br>9. (Trained service technician only) Reseat the system board.<br>10. Reconnect the system to power and turn on the system.<br>11. Run the test again.<br>12. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-905-xxx | BMC | BMC I2C Test | Failed | BMC indicates a failure in the hard disk drive (DASD) bus. | Ignore this error if the hard disk drive backplane is not installed. Otherwise, complete the following steps:<br>1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. Remove power from the system.<br>8. Reseat all connections in the hard disk subsystem, which can include hard disk drives, SCSI or SAS cables, a hard disk backplane, and a hard disk drive or RAID controller.<br>9. (Trained service technician only) Reseat the system board.<br>10. Reconnect the system to power and turn on the system.<br>11. Run the test again.<br>12. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 166-906-xxx | BMC | BMC I2C Test | Failed | BMC indicates a failure in the private bus. | 1. Turn off the system and disconnect it from the power source. You must disconnect the system from ac power to reset the BMC.<br>2. After 45 seconds, reconnect the system to the power source and turn on the system.<br>3. Run the test again.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. Remove power from the system.<br>8. (Trained service technician only) Reseat the system board.<br>9. Reconnect the system to power and turn on the system.<br>10. Run the test again.<br>11. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 201-801-xxx | Memory | Memory Test | Aborted | Test canceled: the system BIOS programmed the memory controller with an invalid CBAR address | 1. Turn off and restart the system.<br>2. Run the test again.<br>3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 201-802-xxx | Memory | Memory Test | Aborted | Test canceled: the end address in the E820 function is less than 16 MB. | 1. Turn off and restart the system.<br>2. Run the test again.<br>3. Make sure that all DIMMs are enabled in the Configuration/Setup Utility program (press F1 at system startup).<br>4. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>5. Run the test again.<br>6. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 201-803-xxx | Memory | Memory Test | Aborted | Test canceled: could not enable the processor cache. | 1. Turn off and restart the system.<br>2. Run the test again.<br>3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 201-804-xxx | Memory | Memory Test | Aborted | Test canceled: the memory controller buffer request failed. | 1. Turn off and restart the system.<br>2. Run the test again.<br>3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 201-805-xxx | Memory | Memory Test | Aborted | Test canceled: the memory controller display/alter write operation was not completed. | 1. Turn off and restart the system.<br>2. Run the test again.<br>3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 201-806-xxx | Memory | Memory Test | Aborted | Test canceled: the memory controller fast scrub operation was not completed. | 1. Turn off and restart the system.<br>2. Run the test again.<br>3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 201-807-xxx | Memory | Memory Test | Aborted | Test canceled: the memory controller buffer free request failed. | 1. Turn off and restart the system.<br>2. Run the test again.<br>3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 201-808-xxx | Memory | Memory Test | Aborted | Test canceled: memory controller display/alter buffer execute error. | 1. Turn off and restart the system.<br>2. Run the test again.<br>3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 201-809-xxx | Memory | Memory Test | Aborted | Test canceled program error: operation running fast scrub. | 1. Turn off and restart the system.<br>2. Run the test again.<br>3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>4. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>5. Run the test again.<br>6. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 201-810-xxx | Memory | Memory Test | Aborted | Test canceled: unknown error code xxx received in COMMONEXIT procedure. | 1. Turn off and restart the system.<br>2. Run the test again.<br>3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>4. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>5. Run the test again.<br>6. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 201-901-xxx | Memory | Memory Test | Failed | Test failure: single-bit error, failing bank x, failing DIMM z. | 1. Turn off the system and disconnect it from the power source.<br>2. Reseat DIMM z.<br>3. Reconnect the system to the power source and turn on the system.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. Replace the failing DIMMs.<br>8. Re-enable all memory in the Configuration/Setup Utility program (press F1 at system startup).<br>9. Run the test again.<br>10. Replace the failing DIMM.<br>11. Re-enable all memory in the Configuration/Setup Utility program (press F1 at system startup).<br>12. Run the test again.<br>13. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 201-902-xxx | Memory | Memory Test | Failed | Test failure: single-bit and multi-bit error, failing bank x, failing DIMM z | 1. Turn off the system and disconnect it from the power source.<br>2. Reseat DIMM z.<br>3. Reconnect the system to the power source and turn on the system.<br>4. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>5. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>6. Run the test again.<br>7. Replace the failing DIMMs.<br>8. Re-enable all memory in the Configuration/Setup Utility program (press F1 at system startup).<br>9. Run the test again.<br>10. Replace the failing DIMMs.<br>11. Re-enable all memory in the Configuration/Setup Utility program (press F1 at system startup).<br>12. Run the test again.<br>13. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 202-801-xxx | Memory | Memory Stress Test | Aborted | Internal program error. | 1. Turn off and restart the system.<br>2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>3. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>4. Run the test again.<br>5. Turn off and restart the system if necessary to recover from a hung state.<br>6. Run the memory diagnostics to identify the specific failing DIMM.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 202-802-xxx | Memory | Memory Stress Test | Aborted | Memory size is insufficient to run the test. At least 1 GB is required. | 1. Turn off and restart the system.<br>2. Make sure that all memory is enabled by checking the Available System Memory in the Resource Utilization section of the DSA event log. If necessary, enable all memory in the Configuration/Setup Utility program (press F1 at system startup).<br>3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>4. Make sure that the BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>5. Run the test again.<br>6. Turn off and restart the system if necessary to recover from a hung state.<br>7. Run the memory diagnostics to identify the specific failing DIMM.<br>8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 202-901-xxx | Memory | Memory Stress Test | Failed | Test failure. | 1. Run the standard DSA memory diagnostic to validate all memory.<br>2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>3. Turn off the system and disconnect it from power.<br>4. Reseat the DIMMs.<br>5. Reconnect the system to power and turn on the system.<br>6. Run the test again.<br>7. Run the standard DSA memory diagnostic to validate all memory.<br>8. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 202-902-xxx | Memory | Memory Stress Test | Failed | General error: memory size is insufficient to run the test. | 1. Turn off and restart the system.<br>2. Make sure that all memory is enabled by checking the Available System Memory in the Resource Utilization section of the DSA event log. If necessary, enable all memory in the Configuration/Setup Utility program (press F1 at system startup).<br>3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>4. Run the test again.<br>5. Turn off and restart the system if necessary to recover from a hung state.<br>6. Run the standard DSA memory diagnostic to validate all memory.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 215-801-xxx | Optical drive | Self-Test | Aborted | Unable to communicate with the device driver. | 1. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>2. Run the test again.<br>3. Check the drive cabling for loose or broken connections at both ends or damage to the cable. Replace the cable if it is damaged.<br>4. Run the test again.<br>5. For additional troubleshooting information, see the "Troubleshooting CD and DVD drive issues" site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559.<br>6. Run the test again.<br>7. Make sure that the system firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>8. Run the test again.<br>9. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 215-802-xxx | Optical drive | Self-Test | Aborted | The media tray is open. | 1. Close the media tray and wait 15 seconds for the media to be recognized..<br>2. Run the test again.<br>3. Insert a new CD or DVD into the drive, and wait for 15 seconds for the media to be recognized.<br>4. Run the test again.<br>5. Check the drive cabling for loose or broken connections at both ends or damage to the cable. Replace the cable if it is damaged.<br>6. Run the test again.<br>7. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>8. Run the test again.<br>9. For additional troubleshooting information, see the "Troubleshooting CD and DVD drive issues" site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559.<br>10. Run the test again.<br>11. Replace the optical drive.<br>12. Run the test again.<br>13. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 215-803-xxx | Optical drive | Self-Test | Failed | The disc might be in use by the system. | 1. Wait for the system activity to stop.<br>2. Run the test again.<br>3. Turn off and restart the system.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 215-901-xxx | Optical drive | Self-Test | Aborted | Drive media is not detected. | 1. Insert a new CD or DVD into the drive and wait for 15 seconds for the media to be recognized.<br>2. Run the test again.<br>3. Check the drive cabling for loose or broken connections at both ends or damage to the cable. Replace the cable if it is damaged.<br>4. Run the test again.<br>5. For additional troubleshooting information, see the "Troubleshooting CD and DVD drive issues" site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559.<br>6. Run the test again.<br>7. Replace the optical drive.<br>8. Run the test again.<br>9. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 215-902-xxx | Optical drive | Self-Test | Failed | Read miscompare. | 1. Insert a new CD or DVD into the drive and wait for 15 seconds for the media to be recognized.<br>2. Run the test again.<br>3. Check the drive cabling for loose or broken connections at both ends or damage to the cable. Replace the cable if it is damaged.<br>4. Run the test again.<br>5. For additional troubleshooting information, see the "Troubleshooting CD and DVD drive issues" site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559.<br>6. Run the test again.<br>7. Replace the optical drive.<br>8. Run the test again.<br>9. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 215-903-xxx | Optical drive | Self-Test | Aborted | Could not access the drive. | 1. Insert a new CD or DVD into the drive and wait for 15 seconds for the media to be recognized.<br>2. Run the test again.<br>3. Check the drive cabling for loose or broken connections at both ends or damage to the cable. Replace the cable if it is damaged.<br>4. Run the test again.<br>5. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA.<br>6. Run the test again.<br>7. For additional troubleshooting information, see the "Troubleshooting CD and DVD drive issues" site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559.<br>8. Run the test again.<br>9. Replace the optical drive.<br>10. Run the test again.<br>11. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 215-904-xxx | Optical drive | Self-Test | Failed | A read error occurred. | 1. Insert a new CD or DVD into the drive and wait for 15 seconds for the media to be recognized.<br>2. Run the test again.<br>3. Check the drive cabling for loose or broken connections at both ends or damage to the cable. Replace the cable if it is damaged.<br>4. Run the test again.<br>5. For additional troubleshooting information, see the "Troubleshooting CD and DVD drive issues" site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559.<br>6. Run the test again.<br>7. Replace the optical drive.<br>8. Run the test again.<br>9. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 405-901-xxx | Broadcom Ethernet device | TestControlRegisters | Failed | | 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>2. Run the test again.<br>3. (Trained service technician only) Replace the system board.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 405-902-xxx | Broadcom Ethernet device | TestMIIRegisters | Failed | | 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>2. Run the test again.<br>3. (Trained service technician only) Replace the system board.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 405-903-xxx | Broadcom Ethernet device | TestEEPROM | Failed | | 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>2. Run the test again.<br>3. (Trained service technician only) Replace the system board.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 405-904-xxx | Broadcom Ethernet device | TestInternalMemory | Failed | | 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>2. Run the test again.<br>3. (Trained service technician only) Replace the system board.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 405-905-xxx | Broadcom Ethernet device | TestInterrupt | Failed | | 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>2. Run the test again.<br>3. Check the interrupt assignments in the PCI Hardware section of the DSA event log. If the Ethernet device is sharing interrupts, if possible, use the Configuration/Setup Utility program (press F1 at system startup) to assign a unique interrupt to the device.<br>4. Run the test again.<br>5. (Trained service technician only) Replace the system board.<br>6. Run the test again.<br>7. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 405-906-xxx | Broadcom Ethernet device | TestLoopbackAtMAC-Layer | Failed | | 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>2. Run the test again.<br>3. (Trained service technician only) Replace the system board.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |
| 405-907-xxx | Broadcom Ethernet device | TestLoopbackAtPhysi-calLayer | Failed | | 1. Check the Ethernet cable for damage and make sure that the cable type and connection are correct.<br>2. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>3. Run the test again.<br>4. (Trained service technician only) Replace the system board.<br>5. Run the test again.<br>6. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

*Table 7. DSA diagnostic messages (continued)*

- **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, System x3350 Type 4192 and 4193 server," on page 45 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.**

| Message number | Component | Test | State | Description | Action |
|---|---|---|---|---|---|
| 405-908-xxx | Broadcom Ethernet device | TestLEDs | Failed | | 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware.<br>2. Run the test again.<br>3. (Trained service technician only) Replace the system board.<br>4. Run the test again.<br>5. If the problem remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL. |

## Recovering from a BIOS update failure

If the BIOS code has become damaged, such as from a power failure during an update, you can recover the BIOS code using the boot block jumper and a BIOS recovery diskette, CD, or DVD. You can obtain a BIOS recovery diskette, CD or DVD using one of the following methods:

- Download the BIOS code update file to a diskette (you must attach an optional external USB portable diskette drive to the server; then, update the BIOS code on the server.
- Download the BIOS code update file to a CD or DVD using a writable optional device; then, start the server with the CD or DVD in the CD or DVD drive to update the BIOS code on the server.

One file type is available for each of these methods. The description next to each file indicates the type of medium to which you can download the file.

To download the BIOS code update from the IBM Web site complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. Under **Product Support**, click **System x**.
3. Under **Popular links**, click **Software and device drivers**.
4. Click **System x3350** to display the matrix of downloadable files for the server.

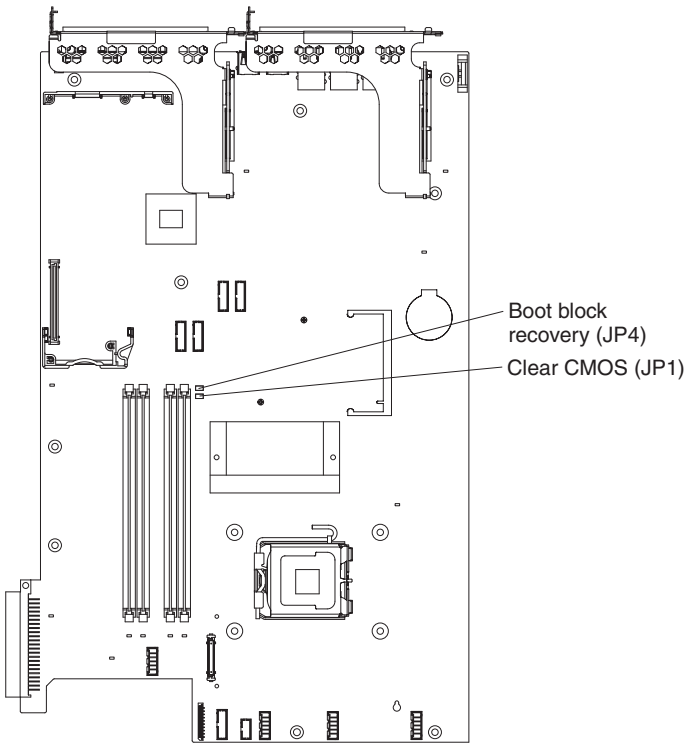
5. Select the applicable file for your operating environment and the file type for the medium you want to use; then, download the BIOS code.

To use a diskette, you must attach an optional external USB diskette drive to the server. To enable the USB diskette drive, CD or DVD follow these steps:

1. Enable the **USB Support** option under the **Devices and I/O Ports** menu choice in the Configuration/Setup Utility program.
2. Set your removable media device as the first startup device.
3. Select the removable media device you want to boot from and move it to the top of the list

To restore the BIOS code, complete the following steps:

1. Read the safety information that begins on page vii and “Handling static-sensitive devices” on page 55.
2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the cover (see “Removing the cover” on page 57.
3. Locate the boot block recovery jumper (JP4) on the system board.




4. Move the jumper from pins 1 and 2 to pins 2 and 3 to enable the BIOS recovery mode.
5. Reinstall the server cover; then, reconnect all power cords.
6. Insert the update diskette, CD, or DVD into the diskette, CD, or DVD drive.
7. Turn on the server and the monitor.

   After the update session is completed, remove the diskette, CD, or DVD from the drive and turn off the server.
8. Disconnect all power cords and external cables; then, remove the server cover.
9. Return the boot block recovery jumper to pins 1 and 2, to return to normal startup mode.

10. Reconnect all external cables and power cords, and turn on the peripheral devices; then, reinstall the server cover.
11. Restart the server.

## System event/error log messages

The system event/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 system event log and the RSA II event/error log, which you can view through the Configuration/Setup Utility program, also contains many information, warning, and error messages.

In the following example, the system event/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
   Message Code: System Complex Powered Up
   Message Code:
   Message Data:
   Message Data:
 - - - - - - - - - - - - - - - - - - - - - - - - -
```

The following table describes the possible system event/error log messages and suggested actions to correct the detected 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, System x3350 Type 4192 and 4193 server," on page 45 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 event/error log message | Action |
|---|---|
| +12v critical over voltage fault | 1. If the OVER SPEC LED on the light path diagnostics panel is lit or the system power error LED on the system board is lit, see the actions in "Power problems" on page 138. (See "System-board LEDs" on page 12 for the location of the system power error LED.)<br>2. If the actions in "Power problems" on page 138 do not identify a defective component, complete the following steps:<br>a. Remove the power supplies. Replace the power supplies one at a time, restarting the server each time, to isolate a failing power supply.<br>b. Replace the power backplane. Restart the server.<br>c. (Trained service technician only) Replace the system board. |
| +12v critical under voltage fault | 1. If the OVER SPEC LED on the light path diagnostics panel is lit or the system power error LED on the system board is lit, see the actions in "Power problems" on page 138. (See "System-board LEDs" on page 12 for the location of the system power error LED.)<br>2. If the actions in "Power problems" on page 138 do not identify a defective component, complete the following steps:<br>a. Remove the power supplies. Replace the power supplies one at a time, restarting the server each time, to isolate a failing power supply.<br>b. If the server fails to start, replace the power backplane. Restart the server.<br>c. (Trained service technician only) Replace the system board. |
| 12v planar fault | 1. If the OVER SPEC LED on the light path diagnostics panel is lit or the system power error LED on the system board is lit, see the actions in "Power problems" on page 138. (See "System-board LEDs" on page 12 for the location of the system power error LED.)<br>2. If the actions in "Power problems" on page 138 do not identify a defective component, complete the following steps:<br>a. Remove the power supplies. Replace the power supplies one at a time, restarting the server each time, to isolate a failing power supply.<br>b. Replace the power backplane. Restart the server.<br>c. (Trained service technician only) Replace the system board. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 event/error log message | Action |
|---|---|
| +5v critical over voltage fault | 1. Remove the following devices, which are powered by 5 volts:<br>• All PCI adapters<br>• USB devices<br>• CD-RW/DVD drive<br>• Hard disk drive backplane<br>2. Reinstall each I/O device that you removed in step 1, one at a time, restarting the server each time, to isolate a defective device. Replace any defective device.<br>3. If the error continues, replace the power backplane. Restart the server.<br>4. (Trained service technician only) Replace the system board. |
| +5v critical under voltage fault | 1. Remove the following devices, which are powered by 5 volts:<br>• All PCI adapters<br>• USB devices<br>• CD-RW/DVD drive<br>• Hard disk drive backplane<br>2. Reinstall each I/O device that you removed in step 1, one at a time, restarting the server each time, to isolate a defective device. Replace any defective device.<br>3. Replace the power backplane. Restart the server.<br>4. (Trained service technician only) Replace the system board. |
| The system real time clock battery is no longer reliable. | Replace the battery. |
| +3.3v critical over voltage fault | 1. Remove all PCI adapters.<br>2. Reinstall each PCI adapter, one at a time, restarting the server each time, to isolate a defective adapter. Replace any defective adapter.<br>3. (Trained service technician only) Replace the system board. |
| +3.3v critical under voltage fault | 1. Remove all PCI adapters.<br>2. Reinstall each PCI adapter, one at a time, restarting the server each time, to isolate a defective adapter. Replace any defective adapter.<br>3. (Ttrained service technician only) Replace the system board. |
| VRD Power Good Fault | 1. (Trained service technician only) Reseat the microprocessor.<br>2. (Trained service technician only) Replace the microprocessor.<br>3. (Trained service technician only) Replace the system board. |

- **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, System x3350 Type 4192 and 4193 server," on page 45 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 event/error log message | Action |
|---|---|
| Fan *n* Fault<br>*n* = the fan number | 1. Make sure that the connector on the fan is not damaged.<br>2. Make sure that the fan connector on the system board is not damaged.<br>3. Make sure that the fan is fully installed (press down on the fan).<br>4. Reseat fan *n*.<br>5. Replace fan *n*. |
| Hard Drive *n* Fault<br>*n* = the hard disk drive number | 1. Reseat hard disk drive *n*.<br>2. Replace hard disk drive *n*. |
| Hard drive *n* removal detected.<br>*n* = the hard disk drive number | Reseat hard disk drive *n*. |
| Power supply *n* removed<br>*n* = the power supply number | 1. Reseat power supply *n*.<br>2. Replace power supply *n*.<br>3. Replace the power backplane. |
| Power supply *n* fault<br>*n* = the power supply number | 1. If the server power-on LED is lit, complete the following steps:<br>a. Reduce the server to the minimum configuration (see "Power-supply LEDs" on page 147).<br>b. Reinstall the components that you removed, one at a time, restarting the server each time.<br>c. If the error recurs, replace the component that you just reinstalled.<br>2. Reseat the following components:<br>a. Power supply *n*<br>b. Power backplane<br>3. Replace the components listed in step 2, one at a time, in the order shown, restarting the server each time. |
| Power supply *n* AC power removed<br>*n* = the power supply number | 1. Make sure that the power cords are correctly connected to the server and to a working electrical outlet.<br>2. Replace the power supply *n*.<br>3. Replace the power backplane. |
| Power supply *n* fan fault<br>*n* = the power supply number | 1. Make sure that there are no obstructions, such as bundled cables, to the airflow on the power-supply fan.<br>2. Replace power supply *n*. |
| Power supply current exceeded max spec value | 1. Make sure that two power supplies are installed and that the ac power cords are correctly connected to the power supplies and to a working electrical outlet.<br>2. (Trained service technician only) Replace the 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, System x3350 Type 4192 and 4193 server," on page 45 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 event/error log message | Action |
|---|---|
| Front panel NMI | 1. If the MEM LED on the light path diagnostics panel is lit, complete the following steps:<br>a. Check the system logs for related entries and actions.<br>b. Reinstall the server device drivers.<br>c. Reinstall the operating system.<br>2. If the error LED for PCI slot 1 or PCI slot 2 is lit, complete the following steps:<br>a. Remove the adapter from the PCI slot that has the lit error LED.<br>b. Replace the riser-card assembly that has the error LED lit.<br>c. (Trained service technician only) Replace the system board.<br>3. Remove all PCI adapters from the server. (<br>4. (Trained service technician only) Replace the system board. |
| Software NMI | Information only |
| CPU IERR detected, the system has been restarted | 1. Make sure that you have installed the latest levels of firmware and device drivers for all adapters and standard devices, such as Ethernet, SCSI, or SAS.<br>2. Run the diagnostics programs for the hard disk drives and other I/O devices.<br>3. (Trained service technician only) Replace the microprocessor. |
| CPU IERR, the CPU has been disabled | 1. (Trained service technician only) Reseat the microprocessor.<br>2. (Trained service technician only) Replace the microprocessor.<br>3. (Trained service technician only) Replace the system board. |
| CPU over temperature | 1. Make sure that the fans are operating, that there are no obstructions to the airflow, that the air baffles are in place and correctly installed, and that the server cover is installed and completely closed.<br>2. (Trained service technician only) Make sure that the heat sink for the microprocessor is installed correctly.<br>3. (Trained service technician only) Replace the microprocessor. |
| VRD critical over voltage fault | 1. (Trained service technician only) Reseat the microprocessor.<br>2. (Trained service technician only) Replace the system board. |
| VRD critical under voltage fault | 1. (Trained service technician only) Reseat the microprocessor.<br>2. (Trained service technician only) Replace the system board. |

## 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. To diagnose a power problem, use the following general procedure:

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 “Solving undetermined problems” on page 216 for the minimum configuration).
4. Reconnect all ac power cords and turn on the server. If the server starts successfully, install 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.

## Solving Ethernet controller problems

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

Try the following procedures:

- Make sure that the correct device drivers, which come with the server are installed and that they are at the latest level.
- 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.
  - 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 Ethernet activity LED on the rear of the server. The Ethernet activity LED is lit when data is active on the Ethernet network. If the Ethernet activity LED is off, make sure that the hub and network are operating and that the correct device drivers are installed.
- Check for operating-system-specific causes of 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 causes of the error.

## Solving undetermined problems

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

If you suspect that a software problem is causing failures (continuous or intermittent), see “Software problems” on page 141.

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, use the clear CMOS jumper to clear the CMOS memory and override the power-on password; see “System-board switches and jumpers” on page 10. If you suspect that the BIOS code is damaged, see “Recovering from a BIOS update failure” on page 208.

Check the LEDs on all the power supplies (see “Power-supply LEDs” on page 147). 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 1 GB (two 512 MB DIMMs in DIMM slots 1 and 3).
   - Service processor (Remote Supervisor Adapter II SlimLine).

   The following minimum configuration is required for the server to start:
   - Microprocessor
   - Two 512 MB DIMMs
   - One power supply
   - Power backplane
   - Power cord
   - ServeRAID SAS controller (some models)
4. Turn on the server. If the problem remains, suspect the following components in the following order:
   a. Power backplane
   b. System board

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 riser card.

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.

## Problem determination tips

Because of the variety of hardware and software combinations that you can encounter, use the following information to assist you in problem determination. If possible, have this information available when you request assistance from IBM.

- Machine type and model
- Microprocessor or hard disk upgrades
- Failure symptom
  - Does the server fail the diagnostic tests?
  - What occurs? When? Where?
  - Does the failure occur on a single server or on multiple servers?
  - Is the failure repeatable?
  - Has this configuration ever worked?
  - What changes, if any, were made before the configuration failed?
  - Is this the original reported failure?
- 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

See Appendix A, “Getting help and technical assistance,” on page 219 for information about calling IBM for service.

# Appendix A. Getting help and technical assistance

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

## Before you call

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the IBM *Documentation* CD that comes with your system.
- Go to the IBM support Web site at http://www.ibm.com/systems/support/ to check for technical information, hints, tips, and new device drivers or to submit a request for information.

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

## Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/systems/support/ and follow the instructions. Also, some documents are available through the IBM Publications Center at http://www.ibm.com/shop/publications/order/.

## Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM systems, optional devices, services, and support. The address for IBM System x™ and xSeries® information is http://www.ibm.com/systems/x/. The address for IBM BladeCenter® information is http://www.ibm.com/systems/bladecenter/. The address for IBM IntelliStation® information is http://www.ibm.com/intellistation/.

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

## Software service and support

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

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

## Hardware service and support

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

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

## IBM Taiwan product service

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

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

# Appendix B. Notices

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## Important notes

Processor speed indicates the internal clock speed of the microprocessor; other factors also affect application performance.

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 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 can vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives that are available from IBM.

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

## Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at http://www.ibm.com/ibm/environment/products/index.shtml.

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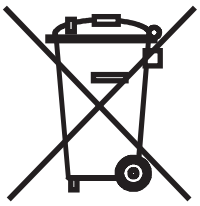

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This appliance is labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

この機器には、EU 諸国に対する廃電気電子機器指令 2002/96/EC(WEEE) のラベルが貼られています。この指令は、EU 諸国に適用する使用済み機器の回収とリサイクルの骨子を定めています。このラベルは、使用済みになった時に指令に従って適正な処理をする必要があることを知らせるために種々の製品に貼られています。

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L'etiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

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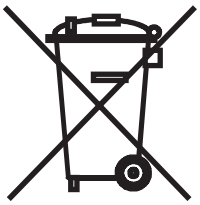
## Battery return program

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

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

**For Taiwan:** Please recycle batteries.


**For the European Union:**



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**For California:**

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

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

## German Ordinance for Work gloss statement

The product is not suitable for use with visual display work place devices according to clause 2 of the German Ordinance for Work with Visual Display Units.

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

## Electronic emission notices

## Federal Communications Commission (FCC) statement

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

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

## Industry Canada Class A emission compliance statement

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

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

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

## Australia and New Zealand Class A statement

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

## United Kingdom telecommunications safety requirement

**Notice to Customers**

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

## European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

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

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

European Community contact:

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## Taiwanese Class A warning statement

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

## Chinese Class A warning statement

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

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

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

## Korean Class A warning statement

이기기는 업무용으로 전자파 적합등록을 받은 기기이오니, 판매자 또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에서 비업무용으로 교환하시기 바랍니다.

# Index


## A

ac good LED 148
ac power LED 7
acoustical noise emissions 3, 4
adapter
  removing 64
  specifications 3
adapters
  installing 65
administrator password 22
  setting/changing 18
advanced setup 18
air baffle, center
  installing 61
  removing 60
air baffle, side
  installing 59
  removing 59
ASM processor 145
assistance, getting 219
attention notices 2

## B

baseboard management controller 27
  command-line interface (IPMI Shell) 27
  configuration utility program 38
  firmware update utility program 39
  SDR/FRU update utility program 40
  Serial over LAN (SOL) 28
  setup utility program 38
baseboard management controller (BMC) settings 19
baseboard management controller configuration utility program 38
baseboard management controller firmware update utility program 39
baseboard management controller SDR/FRU update utility program 40
baseboard management controller setup utility program 38
baseboard management controller utility programs
  configuring 38
Baseboard management controller utility programs 15
battery
  installing 84
  removing 83
battery return program 224
bays 4
beep codes
  POST 112
BIOS
  update and configuration 28
BIOS update failure, recovery 208
BMC system event log 20, 116
boot menu program 23
Broadcom Gigabit Ethernet controller
  configuring 41
Broadcom Gigabit Ethernet Utility program
  enabling 41

## C

cables, connecting 56
caution statements 2
CD drive
  problems 129
  specifications 3
CD-RW/DVD
  drive activity LED 6
  eject button 6
CD-RW/DVD drive
  installing 69
  removing 68
  specifications 4
CD-RW/DVD drive interposer card
  installing 73
  removing 72
checkout procedure 127, 128
Class A electronic emission notice 226
CLI (command-line interface) mode 40
CMOS memory
  clear 22
command-line interface
  commands
    identify 40
    power 40
    sel 40
    sysinfo 40
command-line interface (IPMI Shell) 27
configuration programs
  baseboard management controller utility 15
  Boot Menu 15
  Configuration/Setup Utility program 15
  Ethernet controller 16
  general 15
  IBM Director 16
  LSI Logic Configuration Utility 16
  Remote Supervisor Adapter II SlimLine II 16
  ServerGuide Setup and Installation CD 15
configuration utility program
  boot menu 23
  LSI Logic 26
Configuration/Setup Utility program
  advanced setup 18
  baseboard management controller (BMC) settings 19
  date and time 17
  devices and I/O ports 17
  event/error logs 20
  exit setup 21
  load default settings 21
  menu choices 17
  restore settings 21
  save settings 21
  start options 18

Configuration/Setup Utility program *(continued)*
starting 16
system information 17
system security 17
system summary 17
using 16
configuring
the server 15
connecting cables 56
connector
Ethernet 8
Ethernet systems-management 7
power supply 7
serial 7
USB 6, 7
video
front 6
rear 7
connectors
external 11
front view 5
internal 8, 9
optional-device, system board 13
rear 7
controllers
Ethernet 41
cover
installing 58
removing 57
creating
RAID array 27
customer replaceable units (CRUs) 47

# D

danger statements 2
date and time 17
dc good LED 148
dc power LED 7
devices and I/O ports 17
diagnostic
messages 151
test log, viewing 150
text message format 150
tools, overview 111
diagnostic programs
running 149
DIMMs
installing 75
removing 74
disk drive cage assembly, 2.5-inch
installing 87
removal 87
disk drive cage assembly, 3.5-inch
installing 86
removal 85
diskette drive
specifications 3
display problems 135
DSA Preboot 148
diagnostic messages 151
DSA Preboot *(continued)*
programs and messages 148
running diagnostic programs 149
text messages 150
DVD drive
problems 129

# E

electrical input 3, 4
electronic emission Class A notice 226
environment 3, 4
environmental monitoring 27
error codes and messages
POST/BIOS 117
system event/error 210
error logs
clearing 117
POST 116
system event/error 116
viewing 116
error symptoms
CD-ROM drive, DVD-ROM drive 129
general 130
hard disk drive 130
intermittent 131
keyboard, USB 132
memory 133
microprocessor 134
monitor 135
mouse, USB 132
optional devices 137
pointing device, USB 132
power 138
serial port 139
software 141
USB port 142
errors
beep codes 112
power supply LEDs 148
Ethernet
controller
troubleshooting 215
status LED 8
systems-management connector 7
Ethernet activity
LED 8
Ethernet connector 8
Ethernet controller configuration 16
event/error logs 20
BMC system event log 20
RSA II 20
system 20
exit setup 21
expansion bays 4

# F

fans 4
FCC Class A notice 226

features
server 3
ServerGuide 24
field replaceable units (FRUs) 47
firmware code, updating 38
firmware, updating 15
Formatting
hard disk drives 27
front view 5

## G

getting help 219
gloss statement (Germany) 226
grease, thermal 102
guidelines
installation 53
system reliability 54

## H

hard disk drive
formatting 27
problems 130
hard disk drive activity LED 6
hard disk drive status LED 6
hard drive activity
LED 6
hardware service and support 220
heat output 3, 4
heat sink
installing 101
heatsink
installing 100
removing 99
help, getting 219
hot-swap drive
specifications 3
hot-swap fan
removing 81, 82
hot-swap hard disk drives
installing 71
removing 70
humidity 4

## I

IBM director 16
IBM Director
updating 42
IBM Support Line 220
important notices 2
installing
adapters 65
air baffle, center 61
air baffle, side 59
battery 84
CD-RW/DVD drive 69
CD-RW/DVD drive interposer card 73
cover 58
DIMMs 75
installing *(continued)*
disk drive cage assembly, 2.5-inch 87
disk drive cage assembly, 3.5-inch 86
heat sink 101
heatsink 100
hot-swap hard disk drives 71
media bezel 89
memory modules 75
microprocessor 100
mini-SAS/SATA controller 90
operator information panel 104
power backplane 98
power supply, hot-swap 81
Remote Supervisor Adapter II SlimLine 66
riser-card assembly 63
SAS backplane, 2.5-inch 94
SAS/SATA backplane 92
SATA backplate 92
SATA RAID backplate 96
ServeRAID-MR10i SAS/SATA controller 78
simple-swap backplate 92
simple-swap SATA hard disk drive 70
system board 108
integrated functions 4
intermittent problems 131
internal connectors 8, 9
internal drives
installing 68
removing 68

## J

jumpers 10

## L

LED
ac power 7
CD-RW/DVD drive activity 6
dc power 7
Ethernet activity 8
Ethernet status 8
hard disk drive activity 6
hard disk drive status 6
hard drive activity 6
location 5
power-on 5
rear 7
system information 6
system locator 6
system-error 6
rear 7
system-locator
rear 7
LEDs
system board 12
light path diagnostics 142
LEDs 144
panel 143
Linux configuration 29
load default settings 21

LSI Logic
configuration utility program 26
LSI Logic configuration utility program
starting 26
LSI Logic Configuration Utility program 16

## M

management utility program
OSA SMBridge 28, 36
media bezel
installing 89
removing 88
memory
specifications 3, 4
memory modules
installing 75
removing 74
memory problems 133
messages
service processor 210
microprocessor
installing 100
problems 134
removing 99
specifications 3, 4
Microsoft Windows 2003 35
mini-SAS/SATA controller
installing 90
removing 90
monitor problems 135
mouse problems 132

## N

network management 38
network operating system (NOS) installation
with ServerGuide 25
no-beep symptoms 115
NOS installation
without ServerGuide 25
notes 2
notes, important 222
notices 221
electronic emission 226
FCC, Class A 226
notices and statements 2

## O

online publications 2
operator information panel 5, 143
installing 104
removing 103
optional device problems 137
OSA SMBridge
installing 36
Microsoft Windows 2003 configuration 35
Red Hat Enterprise Linux configuration 29
SUSE SLES configuration 33
OSA SMBridge management utility program 40
OSA SMBridge management utility program *(continued)*
CLI (command-line interface) mode 40
enabling and configuring 28

## P

parts listing 45, 47
passwords 21
administrator 18, 21
power-on 18, 21
resetting 22
PCI
slot 1 7
PCI expansion slots 4
peripheral component interconnect (PCI)
expansion slots 3
pointing device problems 132
POST 111
beep codes 112
error codes 117
error log 116
power
power-control button 6
specifications 4
supply 4
power backplane
installing 98
removing 96
power backplane card
connector location 9
power cords 49
power problems 138, 215
power supply
LEDs 147
power supply LEDs
errors 148
power supply, hot-swap
installing 81
removing 80
power-on
LED
rear 7
power-on LED 5
power-on password 21
setting/changing 18
power-on self-test (POST) 111
problem isolation tables 129
problems
CD-ROM, DVD-ROM drive 129
Ethernet controller 215
hard disk drive 130
intermittent 131
keyboard 132
memory 133
microprocessor 134
monitor 135
optional devices 137
POST/BIOS 117
power 138, 215
serial port 139
software 141

problems *(continued)*
undetermined 216
USB port 142
video 142
product recycling and disposal 223
publications 1

## R

rack release latches 6
RAID array
creating 27
RAID features 26
rear view 7
recycling and disposal, product 223
Red Hat Enterprise Linux 29
redundant array of independent disks (RAID)
configure and manage 26
release latch 6
remind button 144
Remote Supervisor Adapter II SlimLine
cabling 43
completing the setup 44
event/error log 20
installing 66
removing 66
setting up 42
Remote Supervisor Adapter II SlimLine
configuration 16
Remote Supervisor Adapter SlimLine II
installing firmware 43
removal
disk drive cage assembly, 2.5-inch 87
disk drive cage assembly, 3.5-inch 85
removing
adapter 64
air baffle, center 60
air baffle, side 59
battery 83
CD-RW/DVD drive 68
CD-RW/DVD drive interposer card 72
cover 57
DIMMs 74
heatsink 99
hot-swap fan 81, 82
hot-swap hard disk drives 70
media bezel 88
memory modules 74
microprocessor 99
mini-SAS/SATA controller 90
operator information panel 103
power backplane 96
power supply, hot-swap 80
Remote Supervisor Adapter II SlimLine 66
riser-card assembly 62
SAS backplane, 2.5-inch 93
SAS/SATA backplane 92
SATA backplate 92
SATA RAID backplate 95
ServeRAID-MR10i SAS/SATA controller 78
simple-swap backplate 92
removing *(continued)*
simple-swap SATA hard disk drive 69
system board 106
replacement parts 47
resetting passwords 22
restore settings 21
riser-card assembly
installing 63
location 63, 64
removing 62
RSA II event/error log 20

## S

safety information
statement 1 xi
statement 2 xii
statement 26 xv
statement 3 xiii
statement 4 xiv
statement 5 xiv
statement 8 xv
SAS backplane, 2.5-inch
installing 94
removing 93
SAS/SATA backplane
installing 92
removing 92
SATA backplate
installing 92
removing 92
SATA RAID backplate
installing 96
removing 95
save settings 21
serial connector 7
serial over LAN
commands
connect 40
identify 40
power 41
reboot 41
sel get 41
sol 41
sysinfo 41
Serial over LAN (SOL) 28
serial port problems 139
server
configuring 15
features 3
specifications 3
server replaceable units 47
ServeRAID-MR10i SAS/SATA controller
installing 78
removing 78
ServerGuide
CDs 15
error problems 140
features 24
NOS installation 25
setup and configuration 24

ServerGuide *(continued)*
setup and installation CD 24
Setup and Installation CD 15
using 24
Web site 24
service processor messages 210
service, calling for 217
setting up your server 24
setup and configuration
ServerGuide 24
Simple-swap backplate
installing 92
removing 92
simple-swap SATA hard disk drive
installing 70
removing 69
size 4
slots 4
software
error problems 141
software problems 141
software service and support 220
SOL configuration 28
specifications 3
start options 18
startup devices 23
statements and notices 2
static-sensitive devices, handling 55
support, web site 219
SUSE SLES 33
system
error LED, front 6
locator LED, front 6
system-error LED
rear 7
System
information LED 6
system board
external connectors 11
installing 108
internal connectors 8, 9
jumper blocks 10
LEDs 12
optional-device connectors 13
removing 106
switches and jumpers 10
system event/error
log 210
system event/error log 20, 116
system information 17
system reliability 54
system security 17
passwords 17
system specifications 3
system summary 17
system-locator
LED
rear 7
systems-management
Ethernet connector 7

# T

telephone numbers 220
temperature 3, 4
test log, viewing 150
test messages
DSA Preboot 150
thermal grease 102
TOE 4
tools, diagnostic 111
trademarks 221
TÜV gloss statement 226

# U

undetermined problems 216
United States electronic emission Class A notice 226
United States FCC Class A notice 226
Universal Serial Bus (USB) problems 142
updating firmware 15
updating the firmware code 38
USB
connector 6, 7
using
IBM Configuration/Setup Utility program 16

# V

video
specifications 3
video connector
front 6
rear 7
video controller
specifications 4

# W

web site
publication ordering 219
support 219
support line, telephone numbers 220
weight 3

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