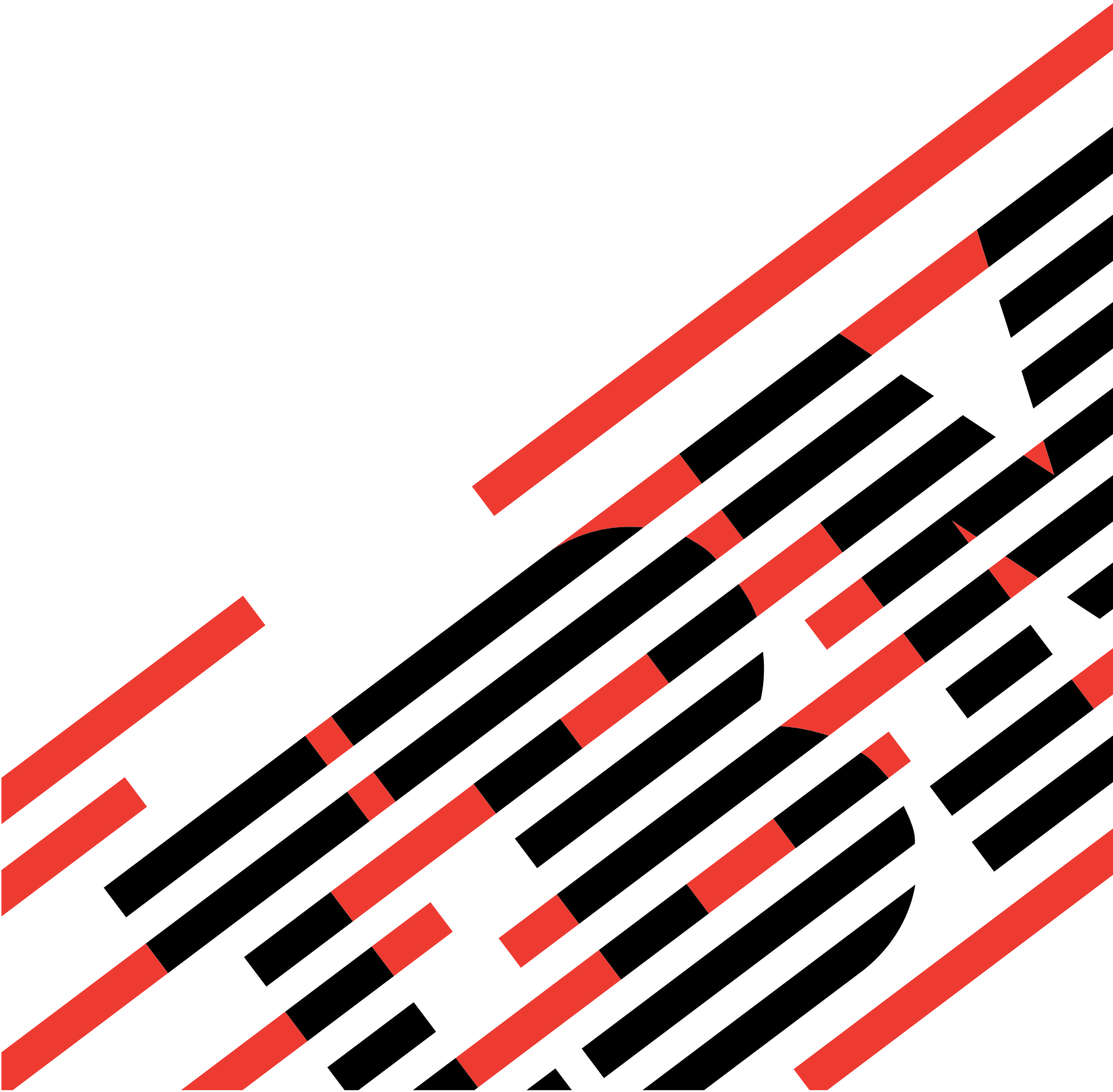
IBM

eserver

xSeries 206m Types 8485 and 8490

Problem Determination and Service Guide



IBM

@server

xSeries 206m Types 8485 and 8490

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 145, and the *Warranty and Support Information* document on the IBM *xSeries Documentation* CD.

Second Edition (October 2005)

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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.

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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 or leaking 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 73.
   - Make sure that the insulation is not frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Guidelines for servicing electrical equipment

Observe the following guidelines when servicing electrical equipment:

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

Safety statements

Important:

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

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

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

Statement 1:



DANGER

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

To avoid a shock hazard:

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

To Connect:	**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.

Statement 4:





≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



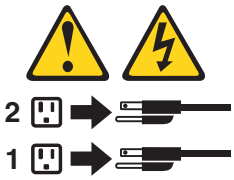
≥ 55 kg (121.2 lb)

CAUTION:
Use safe practices when lifting.

Statement 5:



CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 8:



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



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

Statement 10:



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



>82 kg (180 lb)

Chapter 1. Introduction

This *Problem Determination and Service Guide* contains information to help you solve problems that might occur in the IBM @server® xSeries® 206m Types 8485 and 8490. 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 the 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 options.
- *User's Guide*

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

  This printed document contains instructions for installing the server in a rack.
- *Safety Information*

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

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

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

The server might have features that are not described in the documentation that you received with the server. The documentation might be updated occasionally to include information about those features, or technical updates might be available to provide additional information that is not included in the server documentation.

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

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/support/.
2. Under **Search technical support**, type 8485 or 8490 (depending on the machine type for your server model), and click **Search**.

Notices and statements in this document

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

The following notices and statements are used in this document:

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

Features and specifications

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

Table 1. Features and specifications

Microprocessor:
- Intel® Pentium® 4 Processor
- 1 MB or 2 MB Level-2 or Level-3 cache
- 800 MHz front-side bus (FSB)

Memory:
- Minimum: 512 MB
- Maximum: 8 GB
- Types: PC2-4200 double-data-rate 2 (DDR2)
- Connectors: four dual inline memory module (DIMM) connectors, two-way interleaved

Drives (depending on the model):
- Diskette (optional): 1.44 MB (two modes)
- Hard disk drive: SAS or SATA
- One of the following IDE drives:
  - CD-ROM
  - CD-RW (optional)
  - DVD-ROM (optional)
  - DVD-ROM/CD-RW (optional)

Expansion bays (depending on the model):
- Two 5.25-in. bays (one CD drive installed)
- One 3.5-in. removable-media drive bay
- Four 3.5-in. hard disk drive bays with one of the following bays:
  - Open hot-swap bays
  - Simple-swap bays with one hard disk drive installed
  - Non-hot-swap bays with one hard disk drive installed

PCI expansion slots (depending on the model):
- Four PCI expansion slots
  - One PCI Express x8 slot
  - One PCI Express x1 slot
  - Two PCI 32-bit/33 MHz slots
- Six PCI expansion slots (models with the PCI-X expansion card)
  - One PCI Express x8 slot
  - One PCI Express x1 slot
  - Two PCI 32-bit/33 MHz slots
  - Two PCI-X 64-bit/100 MHz slots
- One connector on PCI-X expansion card for the mini-PCI-X Serial Attached SCSI (SAS) adapter

Fans:
Two or three speed-controlled fans

Power supply:
One of the following power supplies:
- Two redundant 430 watt (90-240 V ac)
- One nonredundant 400 watt (90-240 V ac)

Size:
- Height: 438 mm (17.25 in.)
- Depth: 540 mm (21.25 in.)
- Width: 216 mm (8.5 in.)
- Weight: 16.3 kg (36 lb) to 20.8 kg (45.8 lb) depending upon configuration

Integrated functions:
- Mini baseboard management controller (mini-BMC)
- Broadcom 5721 10/100/1000 Ethernet controller on the system board with RJ-45 Ethernet port
- Two serial ports
- One parallel port
- Four-port Serial ATA controller
- One internal SAS port (mini-PCI slot)
- Integrated RAID capability (HostRAID)
- Four Universal Serial Bus (USB) v2.0 ports (two on front and two on rear)
- Keyboard port
- Mouse port
- ATA-100 single-channel IDE controller (bus mastering)
- ATI ES1000 video controller
  - Compatible with SVGA and VGA
  - 16 MB SDRAM video memory

Diagnostic LEDs:
- Fans
- Memory

Acoustical noise emissions:
- Sound power, idling: 5.0 bel
- Sound power, operating: 5.5 bel

Environment:
- Air temperature:
  - Server on: 10° to 35°C (50° to 95°F) Altitude: 0 to 914 m (2998.0 ft)
  - Server off: -40° to 60°C (-40° to 140°F) Altitude: 0 to 2133 m (7000.0 ft)
- Humidity (operating and storage): 8% to 80%

Heat output:
Approximate heat output in British thermal units (Btu) per hour:
- Minimum configuration: 630 Btu per hour (185 watts)
- Maximum configuration: 1784 Btu per hour (523 watts)

Electrical input:
- Sine-wave input (50 or 60 Hz) required
- Input voltage and frequency ranges automatically selected
- 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: 0.20 kVA (all models)
  - Maximum: 0.55 kVA

Notes:

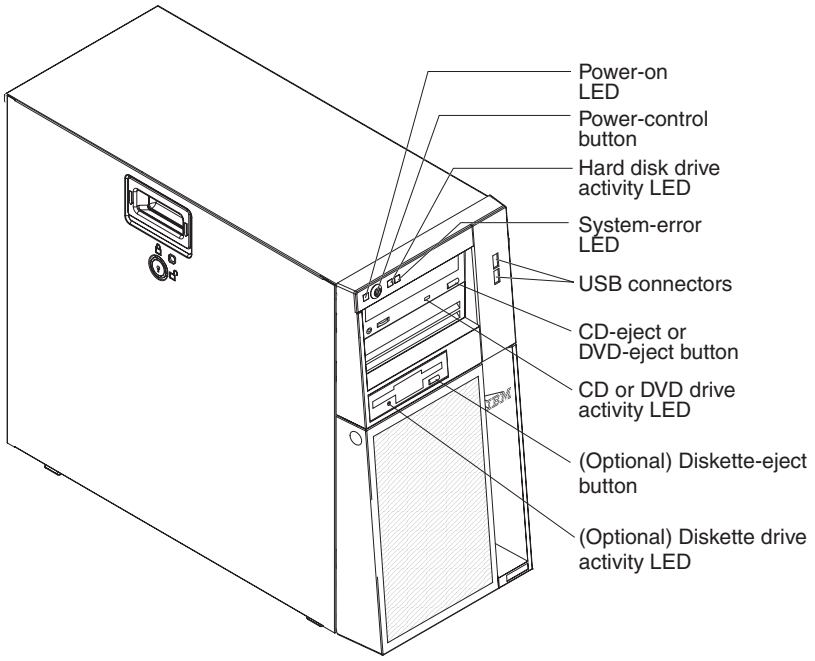
1. Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use.
2. These levels were measured in controlled acoustical environments according to the procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779 and are reported in accordance with ISO 9296. Actual sound-pressure levels in a given location might exceed the average values stated because of room reflections and other nearby noise sources. The declared sound-power levels indicate an upper limit, below which a large number of computers will operate.

Server controls, LEDs, and connectors

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

Front view

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



Power-on LED

When this LED is lit, it indicates that the server is turned on. When this LED is off, it indicates that ac power is not present, or the power supply or the LED itself has failed.

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

Power-control button

Press this button to turn the server on and off manually.

Hard disk drive activity LED

When this LED is flashing, it indicates that a hard disk drive is in use.

System-error LED

When this amber LED is lit, it indicates that a system error has occurred. An LED on the system board might also be lit to help isolate the error. See Chapter 2, “Diagnostics,” on page 13 for additional information.

USB connectors

Connect USB devices to these connectors.

CD-eject or DVD-eject button

Press this button to release a CD from the CD drive or a DVD from the DVD drive.

CD or DVD drive activity LED

When this LED is lit, it indicates that the CD drive or DVD drive is in use.

(Optional) Diskette-eject button

Press this button to release a diskette from the diskette drive.

(Optional) Diskette drive activity LED

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

Ethernet transmit/receive activity LED

This LED is on the Ethernet connector on the rear of the server. When this LED is lit, it indicates that there is activity between the server and the network.

Ethernet link status LED

This LED is on the Ethernet connector on the rear of the server. When this LED is lit, it indicates that there is an active connection on the Ethernet port.

Hot-swap hard disk drive activity LED (some models)

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

When the drive is removed, this LED also is visible on the SAS backplane, next to the drive connector. The backplane is the printed circuit board behind drive bays 4 through 7.

Hot-swap hard disk drive status LED (some models)

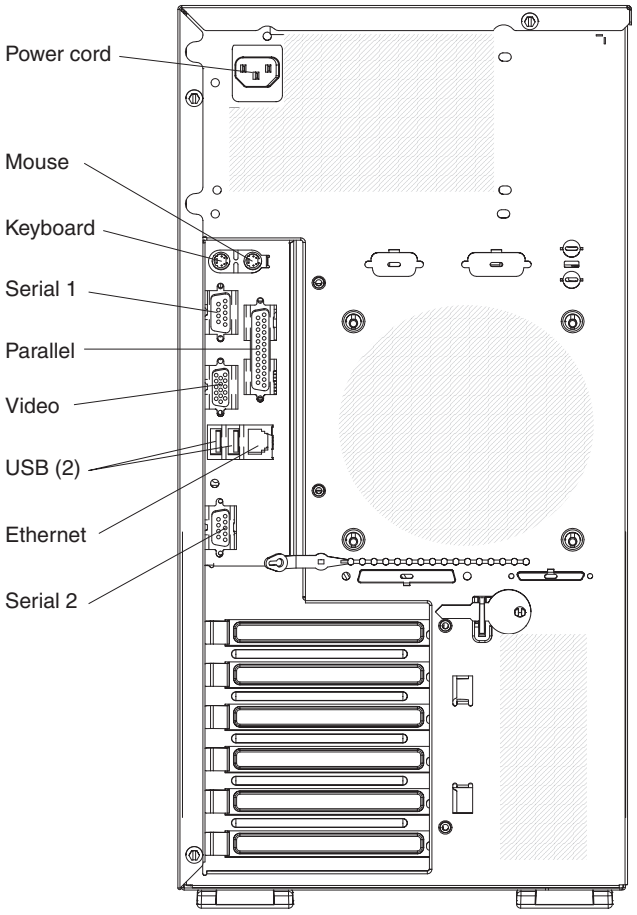
On some server models, each hot-swap hard disk drive has an amber status LED. If this amber status LED for a drive is lit, it indicates that the associated hard disk drive has failed.

If an optional ServeRAID™ adapter is installed in the server and the LED flashes slowly (one flash per second), the drive is being rebuilt. If the LED flashes rapidly (three flashes per second), the adapter is identifying the drive.

When the drive is removed, this LED also is visible on the SAS backplane, below the hot-swap hard disk drive activity LED.

Rear view

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



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

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

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

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

Parallel connector
Connect a parallel device to this connector.

Video connector
Connect a monitor to this connector.

USB connectors
Connect USB devices to these connectors.

Ethernet connector
Use this connector to connect the server to a network.

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

Ethernet transmit/receive activity LED
This LED is on the Ethernet connector. When this LED is lit, it indicates that there is activity between the server and the network.

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

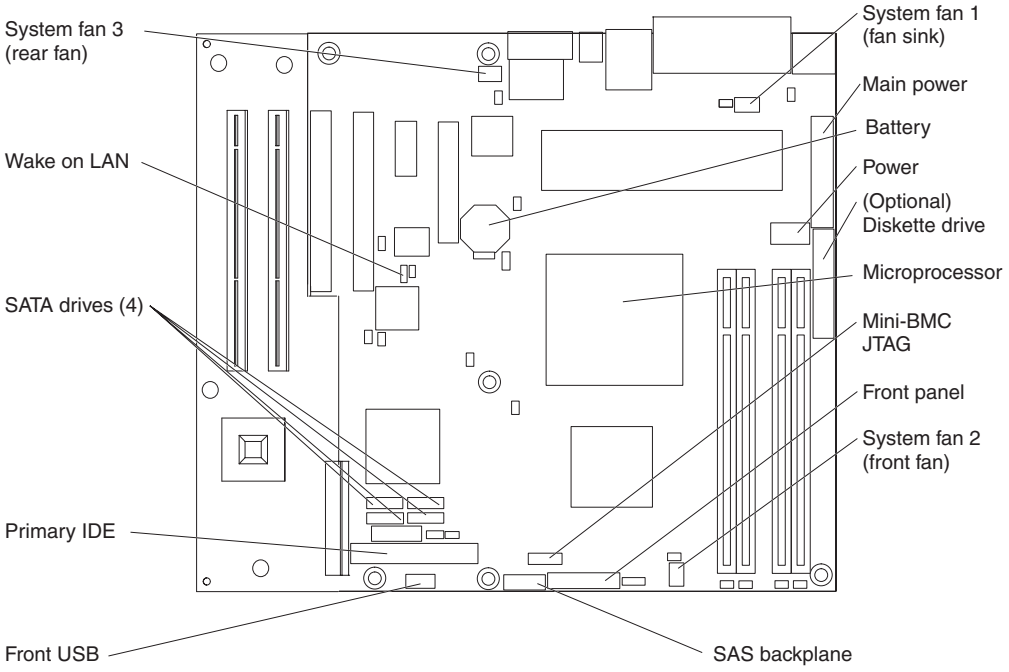
If an optional Remote Supervisor Adapter II (systems-management adapter) is installed, the server has additional connectors and LEDs. For more information about these connectors and LEDs, see the documentation that comes with this adapter. If you install the optional Remote Supervisor Adapter II, you must disconnect the video cable from the system board and connect it to the optional Remote Supervisor Adapter II.

Connectors, LEDs, and jumpers

The following illustrations show the connectors, light-emitting diodes (LEDs), and jumpers on the system board. The illustrations might differ slightly from your hardware.

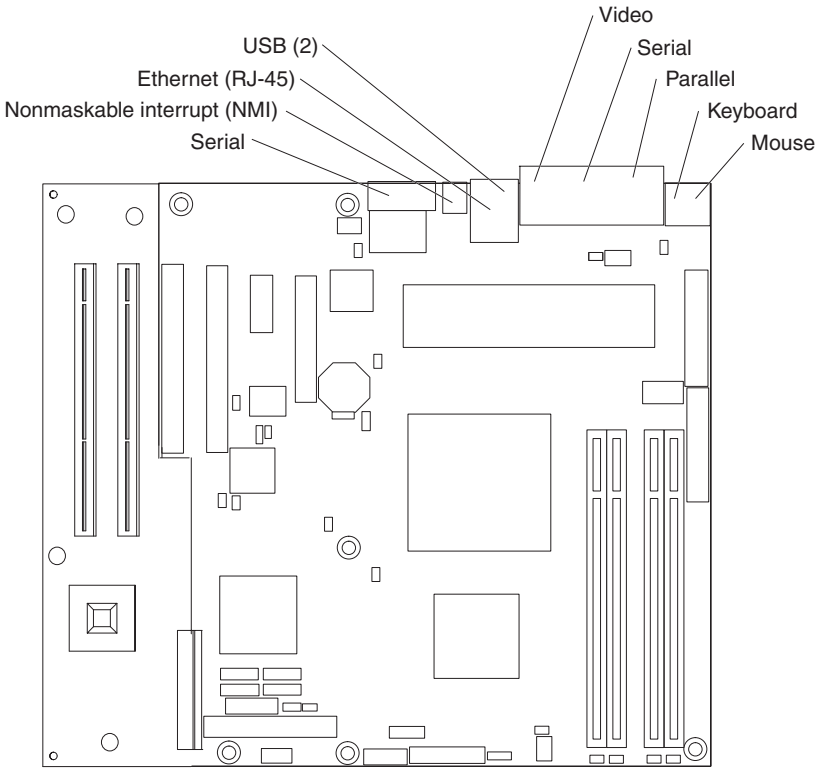
System-board internal connectors

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



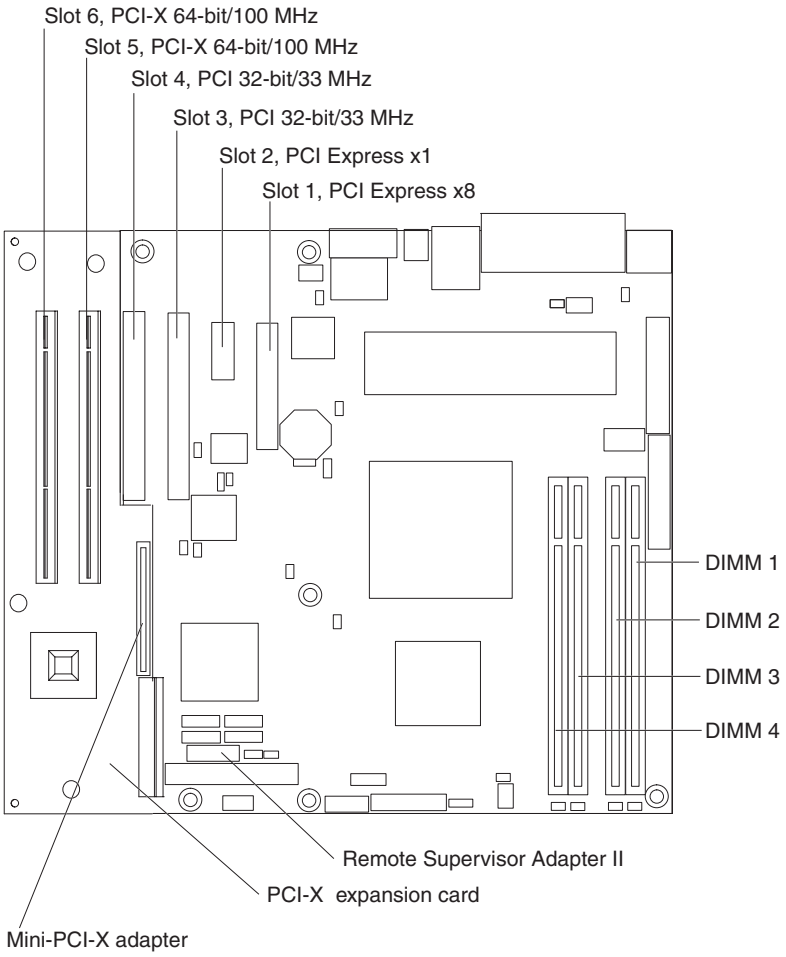
System-board external connectors

The following illustration shows the external input/output (I/O) connectors on the system board.



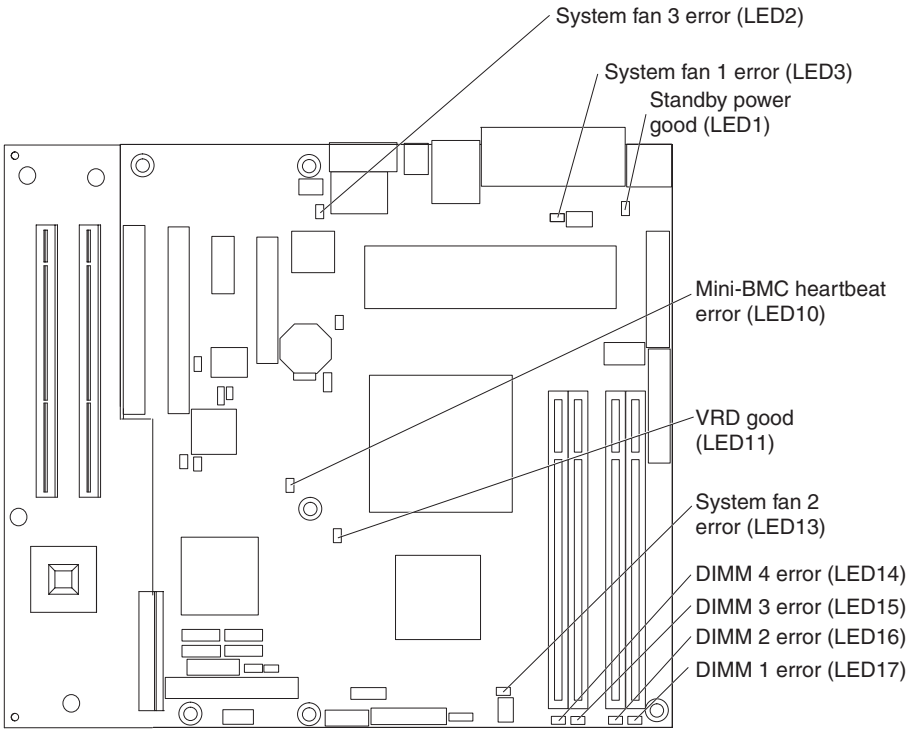
System-board option connectors

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



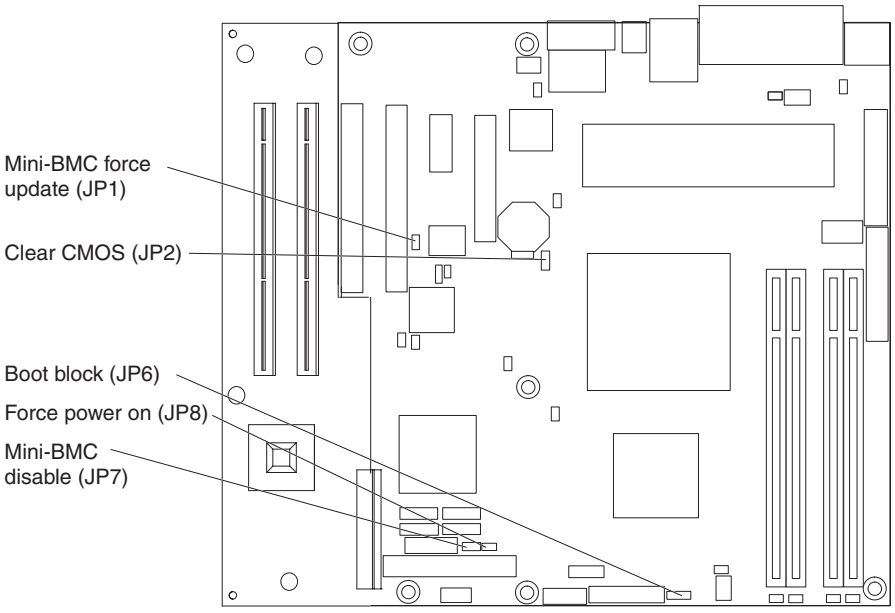
System-board LEDs

The following illustration shows the LEDs on the system board.



System-board jumpers

The following illustration shows the jumpers on the system board.



The following table describes the function of each jumper block.

Table 2. System-board jumper blocks

Jumper name	Description
Mini-BMC force update (JP1)	• Pins 1 and 2: Normal (default) • Pins 2 and 3: Force the mini-BMC to update the server firmware
Clear CMOS (JP2)	• Pins 1 and 2: Keep CMOS data (default) • Pins 2 and 3: Clear the CMOS data, which clears the power-on password **Note:** Changing the position of this jumper does not affect the administrator password check if an administrator password is set. If the administrator password is set and forgotten, the system board must be replaced.
Boot block (JP6)	• Pins 1 and 2: Normal (default) • Pins 2 and 3: Recover boot block (see “Recovering from a BIOS update failure” on page 55)
Force power-on (JP8)	• Pins 1 and 2: Use the power-control buitton to start the server (default) • Pins 2 and 3: Start up the server when ac power is connected
Mini-BMC disable (JP7)	• Pins 2 and 3: Normal (default) • Pins 1 and 2: Disable the mini-BMC. This setting might be necessary when a service processor adapter other than the optional Remote Supervisor Adapter II is installed.

Chapter 2. 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 the problem using the information in this chapter, see Appendix A, “Getting help and technical assistance,” on page 143 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 30.
- **Server LEDs**

  Use the LEDs on the server to diagnose system errors quickly. See “Error LEDs” on page 44 for more information.
- **Diagnostic programs, messages, and error messages**

  The diagnostic programs are the primary method of testing the major components of the server. The diagnostic programs are on the IBM *Enhanced Diagnostics* CD that comes with the server. See “Diagnostic programs, messages, and error codes” on page 45 for more information.

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 prompted, for POST to run.

If POST is completed without detecting any problems, no beeps sound, and the server startup is completed.

If POST detects a problem, several beeps might sound, or an error message is displayed. See “POST beep codes” on page 14 and “POST error codes” on page 18 for more information.

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POST beep codes

A beep code is a combination of short or long beeps or 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 indicates that POST has detected a problem.

The following table describes the beep codes and suggested actions to 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 that indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 36 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, xSeries 206m Types 8485 and 8490,” on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.**

Beep code	Description	Action
1-1-3	CMOS write/read test failed.	1. Reseat the battery. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. (Trained service technician only) System board
1-1-4	BIOS ROM checksum failed.	1. Recover the BIOS code. 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.
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. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. DIMMs 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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Beep code	Description	Action
1-3-1	First 64 K RAM test failed.	1. Reseat the DIMMs. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. DIMMs 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.
2-2-2	Keyboard controller failed.	1. Reseat the keyboard cable. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Keyboard b. (Trained service technician only) System board
2-2-3	CMOS power failure and checksums failed.	1. Reseat the battery. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. (Trained service technician only) System board
3-1-4	Time-of-day clock failed.	1. Reseat the battery. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery 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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Beep code	Description	Action
3-3-3	No operational memory in system.	1. Make sure that the system board contains the correct number and type of DIMMs; install or reseat the DIMMS; then, restart the server. **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). 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. DIMMs b. (Trained service technician only) System board

Error logs

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

> The system event/error log and BMC system event log are limited in size. When these logs are full, new entries will not overwrite existing entries; therefore, you must periodically clear them through the Configuration/Setup Utility program (the menu choices are described in the *User's Guide*). When you are troubleshooting an error, be sure to clear both logs so that you can find current errors more easily.

> **Important:** After you complete a repair or correct an error, clear the BMC system event log to turn off the system-error LED on the front of the server.

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 appears 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 POST error log and the system event/error log from the Configuration/Setup Utility program. For complete information about using the Configuration/Setup Utility program, see the *User's Guide*.

To view the error logs, complete the following steps:

1. Turn on the computer.
2. When the prompt `Press F1 for Configuration/Setup` appears, press F1.
3. Use one of the following procedures:
   - To view the POST error log, select **Error Logs** → **POST Error Log**
   - To view the system event/error log, select **Error Logs** → **System Event/Error Log**
   - > To view the BMC system event log, select **Advanced Setup** → **Baseboard Management Controller (BMC) Setting** → **System Event 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, xSeries 206m Types 8485 and 8490," on page 69 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. Flash the system firmware to the latest level (see "Updating the firmware" on page 133). 2. (Trained service technician only) Replace the system board.
101	Tick timer internal 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.
151	Real-time clock error.	1. Reseat the battery. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. (Trained service technician only) System board
161	Real-time clock battery failure.	1. Reseat the battery. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. (Trained service technician only) System board
162	Invalid configuration information or CMOS random-access memory (RAM) checksum failure.	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings. 2. Reseat the following components: a. Battery b. Failing device (if the device is a FRU, the device must be reseated by a trained service technician only) 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. Failing device (if the device is a FRU, the device must be replaced by a trained service technician only) c. (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, xSeries 206m Types 8485 and 8490," on page 69 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
163	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. 2. Reseat the battery. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. (Trained service technician only) System board
175	Service processor flash code damaged or not loaded.	1. Update the Remote Supervisor Adapter II firmware. 2. Replace the Remote Supervisor Adapter II.
184	Power-on password damaged.	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings. 2. Reseat the battery. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. (Trained service technician only) System board
187	VPD serial number not set.	1. Set the serial number by updating the BIOS code level (see "Updating the firmware" on page 133). 2. (Trained service technician only) Replace the system board.
189	Three attempts were made to access the server with an incorrect password.	Restart the server and enter the administrator password; then, run the Configuration/Setup Utility program and change the power-on password.
289	A DIMM has been disabled by the user or by the system.	1. If the DIMM was disabled by the user, run the Configuration/Setup Utility program and enable the DIMM. 2. Make sure that the DIMM is installed correctly (see "Installing a memory module" on page 102). 3. Replace the DIMM. 4. (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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
301	Keyboard or keyboard controller error.	1. If you have installed a USB keyboard, run the Configuration/Setup Utility program and enable keyboardless operation to prevent the POST error message 301 from being displayed during startup. 2. Reseat the keyboard cable. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Keyboard b. (Trained service technician only) System board
303	Keyboard controller failure.	1. Reseat the keyboard. 2. Replace the keyboard. 3. (Trained service technician only) Replace the system board.
1600	The service processor is not functioning.	1. Update the service processor firmware (see "Updating the firmware" on page 133). 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, xSeries 206m Types 8485 and 8490," on page 69 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
178*x*	Fixed disk error. **Note:** *x* is the drive that has the error.	1. Run the hard disk drive diagnostics tests on drive *x*. 2. Reseat the following components, depending on the server model: • Hot-swap models: a. Hard disk drive *x* b. Mini-PCI-X adapter cable c. Mini-PCI-X adapter d. PCI-X expansion card • Simple-swap models: a. Hard disk drive *x* b. Hard disk drive *x* cable • Non-hot-swap models: hard disk drive *x* cable 3. Replace the following components one at a time, depending on the server model, in the order shown, restarting the server each time: • Hot-swap models: a. Hard disk drive *x* b. Mini-PCI-X adapter cable c. SAS backplane d. Mini-PCI-X adapter e. PCI-X expansion card • Simple-swap and non-hot-swap models: a. Hard disk drive *x* b. Hard disk drive *x* cable 4. (Trained service technician only) Replace the system board.
1800	Unavailable PCI hardware interrupt.	1. Run the Configuration/Setup Utility program and adjust the adapter settings. 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, xSeries 206m Types 8485 and 8490," on page 69 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	A PCI adapter has requested memory resources that are not available.	1. Make sure that no devices have been disabled in the Configuration/Setup Utility program. 2. Change the order of the adapters in the PCI, PCI-X, and PCI Express slots. Make sure that the startup (boot) device is positioned early in the scanning order. (For information about the scanning order, see the *User's Guide* on the IBM *xSeries Documentation* CD). 3. Make sure that the settings for the adapter and all other adapters in the Configuration/Setup Utility program are correct. If the memory resource settings are not correct, change them. 4. If all memory resources are being used, remove an adapter to make memory available to the adapter. Disabling the BIOS on the adapter should correct the error. See the documentation that comes with the adapter.
1805	PCI option read-only memory (ROM) checksum error.	1. Remove the failing PCI adapter. 2. Reseat the following components: a. Each adapter b. PCI-X expansion card (if failing adapter is on the card). 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Failing PCI adapter b. PCI-X expansion card (if failing adapter is on the card). c. (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, xSeries 206m Types 8485 and 8490," on page 69 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
1810	PCI error.	1. Make sure that no devices have been disabled in the Configuration/Setup Utility program. 2. Remove the adapters from the PCI, PCI-X, or PCI Express slots. 3. Reseat the following components: a. Failing adapter **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. b. PCI-X expansion card (if failing adapter is on the card) 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. Failing adapter b. PCI-X expansion card (if failing adapter is on the card) c. (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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
1962	A hard disk drive does not contain a valid boot sector.	1. Make sure that a bootable operating system is installed. 2. Run the hard disk drive diagnostic tests. 3. Reseat the following components, depending on the server model: • Hot-swap models: a. Hard disk drive b. Mini-PCI-X adapter cable c. Mini-PCI-X adapter d. PCI-X expansion card • Simple-swap models: a. Hard disk drive b. Hard disk drive cable • Non-hot-swap models: hard disk drive cable 4. Replace the following components one at a time, depending on the server model, in the order shown, restarting the server each time: • Hot-swap models: a. Hard disk drive b. Mini-PCI-X adapter cable c. SAS backplane d. Mini-PCI-X adapter e. PCI-X expansion card • Simple-swap and non-hot-swap models: a. Hard disk drive b. Hard disk drive cable 5. (Trained service technician only) Replace the system board.
8603	Pointing-device error.	1. Reseat the pointing device. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Pointing device 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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
00012000	Processor machine check error.	1. (Trained service technician only) Reseat the microprocessor. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. (Trained service technician only) Microprocessor b. (Trained service technician only) System board
00019701	Microprocessor 1 failed the built-in self-test (BIST).	1. (Trained service technician only) Reseat the microprocessor. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. (Trained service technician only) Microprocessor b. (Trained service technician only) System board
01298001	No update data for microprocessor 1.	1. Update the BIOS code again (see "Updating the firmware" on page 133). 2. (Trained service technician only) Reseat the microprocessor. 3. (Trained service technician only) Replace the microprocessor.
01298101	Bad update data for processor 1.	1. Update the BIOS code again (see "Updating the firmware" on page 133). 2. (Trained service technician only) Reseat the microprocessor. 3. (Trained service technician only) Replace the microprocessor.

- **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, xSeries 206m Types 8485 and 8490," on page 69 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, depending on the server model: • Hot-swap models: a. Hard disk drive b. Mini-PCI-X adapter cable c. Mini-PCI-X adapter d. PCI-X expansion card • Simple-swap models: a. Hard disk drive b. Hard disk drive cable • Non-hot-swap models: hard disk drive cable 2. Replace the following components one at a time, depending on the server model, in the order shown, restarting the server each time: • Hot-swap models: a. Hard disk drive b. Mini-PCI-X adapter cable c. SAS backplane d. Mini-PCI-X adapter e. PCI-X expansion card • Simple-swap and non-hot-swap models: a. Hard disk drive b. Hard disk drive cable 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, xSeries 206m Types 8485 and 8490," on page 69 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
I9990305	An operating system was not found.	1. Make sure that a bootable operating system is installed. To determine whether an operating system is one of the devices in the startup sequence, run the Configuration/Setup Utility program (see the *User's Guide* on the IBM *xSeries Documentation* CD). 2. Run the hard disk drive diagnostic tests. 3. Reseat the following components, depending on the server model: • Hot-swap models: a. Hard disk drive b. Mini-PCI-X adapter cable c. Mini-PCI-X adapter d. PCI-X expansion card • Simple-swap models: a. Hard disk drive b. Hard disk drive cable • Non-hot-swap models: hard disk drive cable 4. Replace the following components one at a time, depending on the server model, in the order shown, restarting the server each time: • Hot-swap models: a. Hard disk drive b. Mini-PCI-X adapter cable c. SAS backplane d. Mini-PCI-X adapter e. PCI-X expansion card • Simple-swap and non-hot-swap models: a. Hard disk drive b. Hard disk drive cable 5. (Trained service technician only) Replace the system board.
I9990650	AC power has been restored.	1. Reseat the power cords. 2. Check for interruption of the external power. 3. Replace the power cords.

Checkout procedure

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

About the checkout procedure

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

- Read the safety information beginning on page vii.
- The 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 there are multiple error codes or LEDs that indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 36 for information about diagnosing microprocessor problems.
- Before running the diagnostic programs, you must determine whether the failing server is part of a shared hard disk drive cluster (two or more servers sharing external storage devices). If 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. Do not run any suite of tests, such as “quick” or “normal” tests, because this might enable the hard disk drive diagnostic tests.
- If the server is halted and a POST error code is displayed, see “Error logs” on page 17. If the server is halted and no error message is displayed, see “Troubleshooting tables” on page 30 and “Solving undetermined problems” on page 66.
- For information about power-supply problems, see “Solving power problems” on page 64.
- For intermittent problems, check the error log; see “Error logs” on page 17 and “Diagnostic programs, messages, and error codes” on page 45.

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 2.
   - **Yes:** Shut down all failing servers that are related to the cluster. Go to step 2.
2. Complete the following steps:
   a. Turn off the server and all external devices.
   b. Check all cables and power cords.
   c. Set all display controls to the middle positions.
   d. Turn on all external devices.
   e. Turn on the server. If the server does not start, see “Troubleshooting tables” on page 30.
   f. Check the system-error LED on the front panel. If it is lit, check the LEDs on the system board (see “Error LEDs” on page 44).

      Important: If the system-error LED on the front of the server is lit but there are no other error indications, clear the BMC system event log. This log does not clear itself, and if it begins to fill up, the system-error LED will be lit. Also, after you complete a repair or correct an error, clear the BMC system event log to turn off the system-error LED on the front of the server.
   g. Check for the following results:
      - Successful completion of POST, indicated by no beep sounds
      - Successful completion of startup
3. Did one or more beeps sound, or was a POST error code displayed?
   - **Yes:** Find the beep code or error code in “POST beep codes” on page 14 or “POST error codes” on page 18; if necessary, see “Solving undetermined problems” on page 66.
   - **No:** Find the failure symptom in “Troubleshooting tables” on page 30; if necessary, run the diagnostic programs (see “Running the diagnostic programs” on page 45).
     – If you receive an error, see “Diagnostic error codes” on page 47.
     – If the diagnostic programs were completed successfully and you still suspect a problem, see “Solving undetermined problems” on page 66.

Checkpoint codes (trained service technicians only)

A checkpoint code identifies the check that was occurring when the server stopped; it does not provide error codes or suggest replacement components. Checkpoint codes are shown on the checkpoint display, which is on the system board. By using the checkpoint display, you do not have to wait for the video to initialize each time that you restart the server.

There are two types of checkpoint codes: complex programmable logic device (CPLD) hardware checkpoint codes and BIOS checkpoint codes. The BIOS checkpoint codes might change when the BIOS code is updated.

For a list of checkpoint codes for the xSeries 206m server, see http://w3.pc.ibm.com/helpcenter/infotips/techinfo/MIGR-58350.html.

Troubleshooting tables

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

If you cannot find the problem in these tables, see “Running the diagnostic programs” on page 45 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 using the troubleshooting tables:

1. Check the LEDs on the front panel or the system board (see “Error LEDs” on page 44).
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, xSeries 206m Types 8485 and 8490,” on page 69 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: • The IDE channel to which the CD or DVD drive is attached (primary or secondary) is enabled in the Configuration/Setup Utility program. • All cables and jumpers are installed correctly. • The correct device driver is installed for the CD or DVD drive. 2. Run the CD or DVD drive diagnostic programs. 3. Reseat the CD or DVD drive cable. 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. CD or DVD drive cable b. CD or DVD drive c. (Trained service technician only) System board
A CD or DVD is not working correctly.	1. Clean the CD or DVD. 2. Run the CD or DVD drive diagnostic programs. 3. Reseat the CD or DVD drive cable. 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. CD or DVD drive cable b. 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, xSeries 206m Types 8485 and 8490," on page 69 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. 2. Insert the end of a straightened paper clip into the manual tray-release opening. 3. Reseat the CD or DVD drive cable. 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. CD or DVD drive cable b. CD or DVD drive

Diskette 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, xSeries 206m Types 8485 and 8490," on page 69 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 diskette drive activity LED stays lit, or the server bypasses the diskette drive.	• If there is a diskette in the drive, make sure that: – The diskette drive cables are correctly and securely connected. – The diskette drive is enabled in the Configuration/Setup Utility program. – The diskette is good and not damaged. (Try another diskette if you have one.) – The diskette is inserted correctly in the drive. – The diskette contains the necessary files to start the server. – Your software program is working properly. • To prevent diskette drive read/write errors, make sure that the distance between monitors and diskette drives is at least 76 mm (3 in.). If the problem remains, replace the internal diskette 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, xSeries 206m Types 8485 and 8490," on page 69 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, xSeries 206m Types 8485 and 8490," on page 69 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 (the Fixed Disk Test or the SCSI Fixed Disk Test).	Remove the drive indicated on the diagnostic tests; then, run the hard disk drive diagnostic test again. If the remaining drives are recognized, replace the drive that you removed with a new one.
The server stops responding during the hard disk drive diagnostic test.	Remove the hard disk drive that was being tested when the server stopped responding, and run the diagnostic test again. If the hard disk drive diagnostic test runs successfully, replace the drive that you removed with a new one.
A hard disk drive was not detected while the operating system was being started.	Reseat all hard disk drives and cables; then, run the hard disk drive diagnostic tests again.
A hard disk drive passes the diagnostic Fixed Disk Test but the problem remains.	Run the diagnostic SCSI Fixed Disk Test (see "Running the diagnostic programs" on page 45). **Note:** This test is not available on servers that have RAID arrays or servers that have SATA hard disk drives. Use the Fixed Disk Test for SATA hard disk drives or servers that have RAID arrays.

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, xSeries 206m Types 8485 and 8490," on page 69 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: • All cables and cords are connected securely to the rear of the server and attached devices. • When the server is turned on, air is flowing from the fan grille. If there is no airflow, the fan is not working. This can cause the server to overheat and shut down. 2. Check the system/event error log (see "Error logs" on page 17).

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 Chapter 3, "Parts listing, xSeries 206m Types 8485 and 8490," on page 69 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: • The keyboard cable is securely connected. • If you are using a PS/2 keyboard, the keyboard and mouse cables are not reversed. • The server and the monitor are turned on. 2. If you are using a USB keyboard, run the Configuration/Setup Utility program and enable keyboardless operation to prevent the 301 POST error message from being displayed during startup. 3. 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. 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. Keyboard 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, xSeries 206m Types 8485 and 8490," on page 69 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 mouse or pointing device does not work.	1. Make sure that: • The mouse or pointing-device cable is securely connected to the server. • If you are using a PS/2 mouse or pointing device, the keyboard and mouse or pointing-device cables are not reversed. • The mouse or pointing-device device drivers are installed correctly. • The server and the monitor are turned on. • The mouse option is enabled in the Configuration/Setup Utility program. 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. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Mouse or pointing device 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, xSeries 206m Types 8485 and 8490," on page 69 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: • No error LEDs are lit on the front-panel assembly or on the system board. • Memory mirroring does not account for the discrepancy. • The memory modules are seated correctly. • You have installed the correct type of memory. • If you changed the memory, you updated the memory configuration in the Configuration/Setup Utility program. • All DIMMs are enabled. The server might have automatically disabled a DIMM when it detected a problem, or a DIMM might have been manually disabled. 2. Check the POST error log for error message 289: • If a DIMM was disabled by a system-management interrupt (SMI), replace the DIMM. • If a DIMM was disabled by the user or by POST, run the Configuration/Setup Utility program and enable the DIMM. 3. Run memory diagnostics (see "Running the diagnostic programs" on page 45). 4. Make sure that there is no memory mismatch when the server is over the minimum memory configuration (one 512 MB DIMM) and that you have installed the correct number of DIMMs (see the *User's Guide* on the IBM *xSeries Documentation* CD for information about installing optional memory modules). 5. Reseat the DIMMs. 6. Replace the following components one at a time, in the order shown, restarting the server each time: a. DIMMs 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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The server emits a continuous beep during POST, indicating that the startup (boot) microprocessor is not working correctly.	1. Make sure that the microprocessor is supported on this server. 2. (Trained service technician only) Reseat the microprocessor. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. (Trained service technician only) Microprocessor b. (Trained service technician only) System board

Monitor or video problems

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

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, xSeries 206m Types 8485 and 8490," on page 69 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. 2. Try using a different monitor on the server, or try using the monitor that is being tested on a different server. 3. Run the diagnostic programs. If the monitor passes the diagnostic programs, the problem might be a video device driver. 4. Reseat the Remote Supervisor Adapter II (if one is present). 5. Replace the following components one at a time, in the order shown, restarting the server each time: a. Remote Supervisor Adapter II (if one is present) 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, xSeries 206m Types 8485 and 8490," on page 69 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 screen is blank.	1. Make sure that: • The server is turned on. If there is no power to the server, see "Power problems" on page 40. • The monitor cables are connected correctly. • The monitor is turned on and the brightness and contrast controls are adjusted correctly. • No beep codes sound when the server is turned on. **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). 2. Make sure that the correct server is controlling the monitor, if applicable. 3. Make sure that damaged BIOS code is not affecting the video; see "Recovering from a BIOS update failure" on page 55. 4. See "Solving undetermined problems" on page 66.
The monitor works when you turn on the server, but the screen goes blank when you start some application programs.	1. Make sure that: • The application program is not setting a display mode that is higher than the capability of the monitor. • You installed the necessary device drivers for the application. 2. Run video diagnostics (see "Running the diagnostic programs" on page 45). • If the server passes the video diagnostics, the video is good; see "Solving undetermined problems" on page 66. • (Trained service technician only) If the server fails the video diagnostics, 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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.	1. If the monitor self-tests show the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. **Attention:** Moving a color monitor while it is turned on might cause screen discoloration. Move the device and the monitor at least 305 mm (12 in.) apart, and turn on the monitor. **Notes:** a. To prevent diskette drive read/write errors, make sure that the distance between the monitor and any external diskette drive is at least 76 mm (3 in.). b. Non-IBM monitor cables might cause unpredictable problems. 2. Reseat the following components: a. Monitor cable b. Remote Supervisor Adapter II (if one is present) 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Monitor b. Remote Supervisor Adapter II (if one is present) 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 (see "Updating the firmware" on page 133). 2. Reseat the monitor cable. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Monitor 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 Chapter 3, "Parts listing, xSeries 206m Types 8485 and 8490," on page 69 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: • The device is designed for the server (see the ServerProven® list at http://www.ibm.com/servers/eserver/serverproven/compat/us/). • You followed the installation instructions that came with the device and the device is installed correctly. • You have not loosened any other installed devices or cables. • You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or any other device is changed, you must update the configuration. 2. Reseat the device that you just installed. 3. Replace the device that you just installed.
An IBM optional device that used to work does not work now.	1. Make sure that all of the hardware and cable connections for the device are secure. 2. If the device comes with test instructions, use those instructions to test the device. 3. Reseat the failing device. 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 Chapter 3, "Parts listing, xSeries 206m Types 8485 and 8490," on page 69 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 (the server does not start). **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 front-panel assembly power-control button is working correctly: a. Disconnect the server power cords. b. Reconnect the power cords. c. Press the power-control button. d. If the server does not start, bypass the front-panel assembly power-control button by using the force power-on jumper (see "System-board jumpers" on page 11). If the server starts, reseat the front-panel assembly cable and repeat steps 1a through 1c. If the problem remains, replace the front-panel assembly. 2. Make sure that: • The power cords are correctly connected to the server and to a working electrical outlet. • The server contains the correct type of DIMMs. • The DIMMs are correctly seated. • The LEDs on the power supply do not indicate a problem. • The microprocessor is correctly installed. 3. Reseat the following components: a. DIMMs b. Power supply cables to all internal components c. Power supplies (hot-swap models) 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. DIMMs b. Power supplies (hot-swap models) c. (Trained service technician only) Power supply (non-hot swap models) 5. 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. 6. See "Solving undetermined problems" on page 66.
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: a. Press Ctrl+Alt+Delete. b. Turn off the server by holding the power-control button for 5 seconds. c. Restart the server. 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. 2. (Trained service technician only) If the problem remains or if you are using an ACPI-aware operating system, suspect 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, xSeries 206m Types 8485 and 8490," on page 69 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 unexpectedly shuts down, and the LEDs on the front-panel assembly are not lit.	See "Solving undetermined problems" on page 66.

Serial port problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, xSeries 206m Types 8485 and 8490," on page 69 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: • Each port is assigned a unique address in the Configuration/Setup Utility program and none of the serial ports is disabled. • The serial-port adapter (if one is present) is seated correctly. 2. Reseat the serial-port adapter. 3. Replace the serial-port adapter.
A serial device does not work.	1. Make sure that: • The device is compatible with the server. • The serial port is enabled and is assigned a unique address. • The device is connected to the correct connector (see "Connectors, LEDs, and jumpers" on page 7). 2. Reseat the following components: a. Failing serial device b. Serial cable c. Remote Supervisor Adapter II (if one is present) 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Failing serial device b. Serial cable c. Remote Supervisor Adapter II (if one is present) 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, xSeries 206m Types 8485 and 8490," on page 69 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.	• Make sure that the server supports the ServerGuide program and has a startable (bootable) CD or DVD drive. • If the startup (boot) sequence settings have been changed, make sure that the CD or DVD drive is first in the startup sequence. • 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 program cannot view all installed drives, or the operating system cannot be installed.	• Make sure that there are no duplicate IRQ assignments. • Make sure that the hard disk drive is connected correctly.
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.
The operating system cannot be installed; the option is not available.	Make sure that the operating-system CD is supported on the server. If the operating system is supported, no logical drive is defined (RAID servers). 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, xSeries 206m Types 8485 and 8490," on page 69 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: • 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. • The software is designed to operate on the server. • Other software works on the server. • The software works on another server. 2. If you received any error messages when using the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem. 3. Contact your place of purchase of the software.

Universal Serial Bus (USB) port problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, xSeries 206m Types 8485 and 8490," on page 69 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. Run USB diagnostics (see "Running the diagnostic programs" on page 45). 2. Make sure that: • The correct USB device driver is installed. • The operating system supports USB devices. • A standard PS/2 keyboard or mouse is not connected to the server. If it is, a USB keyboard or mouse will not work during POST. 3. Make sure that the USB configuration options are set correctly in the Configuration/Setup Utility program menu. (For more information, see the *User's Guide* on the IBM *xSeries Documentation* CD). 4. If you are using a USB hub, disconnect the USB device from the hub and connect it directly to the server.

Error LEDs

The system board has error LEDs that will help to locate the source of the error (see “System-board LEDs” on page 10). Run the diagnostic programs to find out the cause of the error (see “Running the diagnostic programs” on page 45).

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

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

Important: If the system-error LED on the front of the server is lit but there are no other error indications, clear the BMC system event log. This log does not clear itself, and if it begins to fill up, the system-error LED will be lit. Also, after you complete a repair or correct an error, clear the BMC system event log to turn off the system-error LED on the front of the server.

Before working inside the server to view the LEDs, read the safety information that begins on page vii and “Handling static-sensitive devices” on page 77.

If an error occurs, view the server LEDs in the following order:

1. Check the front-panel assembly on the front of the server. If the system-error LED is lit, it indicates that an error has occurred.
2. Check the front and rear of the server to determine whether any component LEDs are lit.
3. Remove the server cover and look inside the server for lit LEDs. Certain components inside the server have LEDs that will be lit to indicate the location of a problem. For example, a DIMM error will light the LED next to the failing DIMM on the system board.

   Look at the system service label on the top of the server, which gives an overview of internal components. This information can often provide enough information to correct the error.

Diagnostic programs, messages, and error codes

The server diagnostic programs are the primary method of testing the major components of the server. As you run the diagnostic programs, text messages and error codes are displayed on the screen and are saved in the test log. A diagnostic text message or error code indicates that a problem has been detected; to determine what action you should take as a result of a message or error code, see the table in "Diagnostic error codes" on page 47.

Running the diagnostic programs

To run the 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 you see `Press F1 For Configuration/Setup`, press the F1 key.
4. When the Configuration/Setup Utility menu appears, 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/DVD-ROM** as the first startup device.
8. Press Esc two times to return to the Configuration/Setup Utility menu.
9. Insert the IBM *Enhanced Diagnostics* CD in the CD drive.
10. Select **Save & Exit Setup** and follow the prompts. The diagnostics will load.
11. From the diagnostic programs screen, select the test that you want to run, and follow the instructions on the screen.

    When you are diagnosing hard disk drives, select **SCSI Fixed Disk Test** for the most thorough test. Select **Fixed Disk Test** for any of the following situations:

    - You want to run a faster test.
    - The server contains RAID arrays.
    - The server contains simple-swap SATA hard disk drives.

To determine what action you should take as a result of a diagnostic text message or error code, see the table in "Diagnostic error codes" on page 47.

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 there are multiple error codes or LEDs that indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See "Microprocessor problems" on page 36 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.

The keyboard and mouse (pointing device) tests assume that a keyboard and mouse are attached to the server. If no mouse or a USB mouse is attached to the server, you cannot use the **Next Cat** and **Prev Cat** buttons to select categories. All other mouse-selectable functions are available through function keys. You can use the regular keyboard test to test a USB keyboard, and you can use the regular mouse test to test a USB mouse. You can run the USB interface test only if no USB devices are attached. The USB test will not run if a Remote Supervisor Adapter II is installed.

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

Diagnostic text messages

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

Passed: The test was completed without any errors.

Failed: The test detected an error.

User Aborted: You stopped the test before it was completed.

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

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

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

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

Viewing the test log

To view the test log when the tests are completed, select **Utility** from the top of the screen and then select **View Test Log**. You can also press F3 from the diagnostic menus to view the Summary Test Log. To view the detailed test log, press Tab while viewing the Summary Test Log. The test-log data is maintained only while you are running the diagnostic programs. When you exit from the diagnostic programs, the test log is cleared.

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

Notes:

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

Diagnostic error codes

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

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

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

000 The server passed the test. Do not replace a CRU or FRU.

195 The Esc key was pressed to end the test. Do not replace a CRU or FRU.

197 This is a warning error, but it does not indicate a hardware failure; do not replace a CRU or FRU. Take the action that is indicated in the Action column but *do not replace a CRU or a FRU*. See the description of **Warning** in "Diagnostic text messages" on page 46 for more information.

- **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, xSeries 206m Types 8485 and 8490," on page 69 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
005-xxx-000	Failed video test.	1. Reseat the video adapter, if one is installed. 2. (Trained service technician only) Replace the system board.
011-xxx-000	Failed COM1 serial port test.	1. Check the loopback plug that is connected to the externalized serial port. 2. Check the cable from the externalized serial port to the system board. 3. (Trained service technician only) Replace the system board.
020-xxx-000	Failed PCI Interface test.	1. Replace the following components one at a time, in the order shown, restarting the server each time: a. PCI-X expansion card 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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
035-002-0nn	ServeRAID interface timeout.	1. Make sure that the ServeRAID controller is configured correctly. Obtain the basic and extended configuration status bytes and see the ServeRAID documentation for more information. 2. Reseat the following components: a. SAS backplane cable b. ServeRAID adapter 3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.
035-253-0nn	ServeRAID controller 0nn initialization failure; 0nn = the controller number.	1. Make sure that the ServeRAID controller is configured correctly. See the ServeRAID documentation for more information. 2. Reseat the following components: a. SAS backplane cable b. ServeRAID adapter 3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.
035-253-s99	RAID adapter initialization failure.	1. Reseat the following components: a. ServeRAID adapter b. SAS backplane cable 2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.
035-254-0nn	Setup error; unable to allocate memory to run test.	Check the system resources and make more memory available (see "Using the Configuration/Setup Utility program" on page 134); then, run the test again.
035-255-0nn	Internal error.	1. Reseat the SAS backplane cable. 2. Replace the SAS backplane.
035-260-0nn	System to controller interface failure.	1. Reseat the ServeRAID adapter. 2. Replace the ServeRAID adapter. 3. Restart the server.
035-265-0nn	Adapter Communication error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID adapter.
035-266-0nn	Adapter CPU test error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter 3. Replace the RAID 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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
035-267-0nn	Adapter Local RAM test error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID adapter.
035-268-0nn	Adapter NVSRAM test error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID adapter.
035-269-0nn	Adapter Cache test error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID adapter.
035-271-0nn	Adapter XOR engine test error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID adapter.
035-272-0nn	Adapter Drive test error.	Replace the attached drive.
035-273-0nn	Adapter Drive error.	Replace the attached drive.
035-274-0nn	Adapter Parameters set error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID adapter.
035-275-001	Adapter Communication error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID adapter.
035-276-001	Adapter CPU test error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID adapter.
035-277-001	Adapter Local RAM test error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID adapter.
035-278-001	Adapter NVSRAM test error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID 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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
035-279-001	Adapter Cache test error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID adapter.
035-280-001	Adapter Drive test error.	Replace the attached drive.
035-281-001	Adapter Drive error.	Replace the attached drive.
035-282-001	Adapter Parameters set error.	1. Update the RAID controller firmware (see "Updating the firmware" on page 133). 2. Reseat the RAID adapter. 3. Replace the RAID adapter.
035-283-001	Adapter Battery error.	Replace the battery module on the RAID adapter.
035-xxx-cnn	c = ServeRAID channel number, nn = ID of failing hard disk drive.	1. Check the system event/error log and replace any indicated failing devices. **Note:** A FRU must be replaced by a trained service technician only. 2. Reseat the hard disk drive on channel C, ID nn. 3. Replace the hard disk drive on channel C, ID nn.
035-xxx-snn	Failed hard disk drive with ID nn on RAID adapter in slot s.	1. Check the system event/error log and replace any indicated failing devices. **Note:** A FRU must be replaced by a trained service technician only. 2. Reseat the disk with ID nn on adapter in slot s. 3. Replace the disk with ID nn on adapter in slot s.
035-xxx-099	No adapters were found.	If an adapter is installed: 1. Reseat the adapter. 2. Check the adapter cables to be sure that they are secure.
035-xxx-s99	Failed RAID test: s = number of failing adapter slot	1. Check the system event/error log and replace any indicated failing devices. **Note:** A FRU must be replaced by a trained service technician only. 2. Reseat the following components: a. RAID adapter in slot s b. Cable for the RAID adapter in slot s 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. RAID adapter in slot s b. Cable for the RAID adapter in slot s c. (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, xSeries 206m Types 8485 and 8490," on page 69 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
075-xxx-000	Failed power supply test.	Depending on the server model: • Replace the hot-swap power supply. • (Trained service technician only) Replace the non-hot-swap power supply.
089-xxx-0nn	Failed microprocessor test.	1. Make sure that the BIOS code is at the latest level. 2. (Trained service technician only) Reseat the microprocessor. 3. (Trained service technician only) Replace the microprocessor.
201-xxx-00n	Failed memory test. **Note:** n = slot number of failing DIMM	Replace the following components one at a time, in the order shown, restarting the server each time: 1. DIMM identified by nn 2. (Trained service technician only) System board.
201-xxx-n99	Multiple DIMM failure. **Note:** n = bank number of failing pair	1. See the error text to identify the failing DIMMs. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. DIMMs in bank n b. (Trained service technician only) System board.
206-xxx-000	Failed diskette drive test.	1. Rerun the diskette drive test using another diskette. 2. Reseat the diskette drive cable. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Diskette drive b. (Trained service technician only) System board
215-xxx-000	Failed CD or DVD test.	1. Run the test again with a different CD or DVD. 2. Reseat the CD or DVD drive cable. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. CD or DVD drive 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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
217-198-xxx	Could not establish drive parameters.	1. Reseat the following components, depending on the server model: • Hot-swap models: a. Hard disk drive b. Mini-PCI-X adapter cable c. Mini-PCI-X adapter d. PCI-X expansion card • Simple-swap models: a. Hard disk drive b. Hard disk drive cable • Non-hot-swap models: hard disk drive cable 2. Replace the following components one at a time, depending on the server model, in the order shown, restarting the server each time: • Hot-swap models: a. Hard disk drive b. Mini-PCI-X adapter cable c. SAS backplane d. Mini-PCI-X adapter e. PCI-X expansion card • Simple-swap and non-hot-swap models: a. Hard disk drive b. Hard disk drive cable 3. (Trained service technician only) Replace the system board.
217-xxx-000	Failed fixed disk test.	1. Reseat hard disk drive 1. 2. Replace hard disk drive 1.
217-xxx-001	Failed fixed disk test.	1. Reseat hard disk drive 2. 2. Replace hard disk drive 2.
217-xxx-002	Failed fixed disk test.	1. Reseat hard disk drive 3. 2. Replace hard disk drive 3.
217-xxx-003	Failed fixed disk test.	1. Reseat hard disk drive 4. 2. Replace hard disk drive 4.
217-xxx-004	Failed fixed disk test.	1. Reseat hard disk drive 5. 2. Replace hard disk drive 5.

- **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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
301-xxx-000	Failed keyboard test. **Note:** After installing a USB keyboard, you might have to use the Configuration/Setup Utility program to enable keyboardless operation and prevent the POST error message 301 from being displayed during startup.	1. Reseat the keyboard cable. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Keyboard b. (Trained service technician only) System board
302-xxx-xxx	Failed mouse test.	1. Reseat the mouse cable. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Mouse b. (Trained service technician only) System board
305-xxx-xxx	Failed video monitor test.	1. Reseat the monitor cable. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Monitor b. (Trained service technician only) System board
405-199-00n	Failed. No good link! Check loopback plug. For single/dual port, n >= 0	1. Make sure that the loopback plug is a gigabit loopback plug. 2. Make sure that the loopback plug is tight in the slot (a green LED blinks on the port). 3. On a dual-port server, use two loopback plugs at the same time, one in each port. 4. Replace the loopback plug.
405-xxx-000	Failed Ethernet test on controller on the system board.	1. Run the Configuration/Setup Utility program. Make sure that: • The Ethernet adapter is not disabled • The BIOS code is at the latest level 2. Reseat the Ethernet adapter. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Ethernet adapter 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, xSeries 206m Types 8485 and 8490," on page 69 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
405-xxx-00n	Failed Ethernet test on adapter in PCI slot. • For single port, n > 0 • For dual port, n > 1	1. Complete the following steps to identify the slot on the system board or the PCI-X expansion card: a. Run the Configuration/Setup Utility program. b. Select **Advanced Setup --> PCI Slot/Device Information**. In the information for Ethernet Controller, the entry in the Slot column is the PCI slot number for the adapter. **Note:** If adapters are installed in more than one slot, the failing adapter is the one whose MAC address in the Ethernet Controller information matches the MAC address on the diagnostics screen where the failure occurs. 2. Reseat the Ethernet adapter in the slot. 3. Replace the Ethernet adapter in the slot.

Recovering from a BIOS update failure

If power to the server is interrupted while BIOS code is being updated, the server might not restart correctly or might not display video. If this happens, complete the following steps to recover:

1. Read the safety information that begins on page vii and “Handling static-sensitive devices” on page 77.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Locate the boot block recovery jumper on the system board (see “System-board jumpers” on page 11), removing any adapters that impede access to the jumper (see “Removing an adapter” on page 84).
5. Move the boot block recovery jumper from pins 1 and 2 to pins 2 and 3.
6. Replace any adapters that were removed (see “Installing an adapter” on page 85); then, install the side cover (see “Installing the side cover” on page 79).
7. Reconnect all external cables and power cords.
8. Insert the update CD into the CD or DVD drive.
9. Turn on the server and the monitor.

   After the update session is completed, remove the CD from the drive and turn off the server.
10. Disconnect all power cords and external cables.
11. Remove the side cover (see “Removing the side cover” on page 78).
12. Remove any adapters that impede access to the boot block recovery jumper (see “Removing an adapter” on page 84).
13. Move the boot block recovery jumper from pins 2 and 3 to pins 1 and 2.
14. Replace any adapters that were removed “Installing an adapter” on page 85; then, install the side cover (see “Installing the side cover” on page 79).
15. Lock the side cover if it was unlocked during removal.
16. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

System-error log messages

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

Information Information messages do not require action; they record significant system-level events, such as when the server is started.

Warning Warning messages do not require immediate action; they indicate possible problems, such as when the recommended maximum ambient temperature is exceeded.

Error Error messages might require action; they indicate system errors, such as when a fan is not detected.

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

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

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

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

- **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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
A system NMI was detected	Make sure that the system software is operating correctly and does not conflict with other software; the system software has created a software NMI, or pressing the NMI button has created a service NMI.
Alert accepted by remote system *x*; type:*y*, ID:*z*	Information only.
Alert accepted from system *x*; type:*y*, sender's ID:*z*	Information only.
Alert ID *x* will be retried by sender; when accepted by a remote system, it will have a different ID	Information only.
Alert not accepted by remote system *x*; type:*y*, ID:*z*	Information only.
Alert not accepted from system *x*; type:*y*, sender's ID:*z*	Information only.

- **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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
ASM Reset -- reason unknown	Information only.
ASM Reset due to *x*, Instruction Fault: *y*	Information only.
ASM Reset due Watchdog timeout	Information only.
ASM Reset was caused by restoring default values	Information only.
ASM Reset was initiated by the user	Information only.
Cable: Service processor not present	1. Check the pins and connectors on the cable that connects the Remote Supervisor Adapter II or other service processor adapter to the Remote Supervisor Adapter connector on the system board (see "System-board option connectors" on page 9 for the location of the connector). 2. Reseat the cable (both ends) from the Remote Supervisor Adapter II or other service processor adapter to the Remote Supervisor Adapter connector on the system board.
Configuration error recovery on the Inter-connect network	Information only.
CPU over temperature	1. Make sure that the fan sink has good airflow and is not obstructed. 2. Reseat the following components: a. Fan sink cable b. (Trained service technician only) Fan sink
DASD controller removal	1. Make sure that the mini-PCI-X adapter cable is not damaged. 2. Reseat the mini-PCI-X adapter cable. 3. Replace the mini-PCI-X adapter cable.
DHCP failure,no IP@ assigned-RETRYING!,rc=*xxx*,count=*yyy*	Information only.
Dialback failed for userid *w*. Could not connect at phone number *x*, *y*, *z*	Information only.
ENET[*eee*] DHCP-HstNme=*a*,DN=*b*,IP@=*ccc.ccc.ccc.ccc* GW@=*ddd.ddd.ddd.ddd*, NMsk=*fff.fff.fff.fff*, DNS1@=*ggg.ggg.ggg.ggg*, DNS2@=*hhh.hhh.hhh.hhh*	Information only.
ENET[*eee*] IP-Cfg:HstName=*x*, IP@=*ccc.ccc.ccc.ccc*, GW@=*ddd.ddd.ddd.ddd*, NetMsk=*fff.fff.fff.fff*	Information only.

- **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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
Failure reading an I2C device, possible bus failure	1. Reseat the following components: a. AC power cords b. Hot-swap power supplies, if equipped c. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
Fan *x* Failure	1. Make sure that fan *x* is not obstructed. 2. Reseat the fan *x* cable. 3. Replace fan *x*.
Fan *x* Outside Recommended Speed	1. Make sure that fan *x* is not obstructed. 2. Reseat the fan *x* cable. 3. Replace fan *x*.
Flash of *x* by *y* via *z* was successful...*w*	Information only.
Flash of *x* via *z* failed for user *z...z*	Information only.
Flash succeeded for *x* (address: *y*)	Information only.
Hard Drive *x* Fault	1. Run the diagnostics programs. 2. Replace hard disk drive *x*. 3. Replace the following component, depending on the server model: • Hot-swap models: SAS backplane • Simple-swap and non-hot-swap models: Hard disk drive *x* cable
Hard drive *x* removal detected.	Reseat the following component, depending on the server model: • Hot-swap and simple-swap models: Hard disk drive *x* • Non-hot-swap models: Hard disk drive *x* cable
Internal Error CPU Fault	Information only. If the message remains: 1. (Trained service technician only) Reseat the microprocessor. 2. (Trained service technician only) Replace the microprocessor.
Invalid userid or password received. Userid is *w*, *x*, *y*, *z*	Information only.
LAN: Command Mode tamper triggered. Possible break in attempt	Information only.
LAN: Telnet tamper triggered. Possible break in attempt	Information only.
LAN: Web Server tamper delay triggered. Possible break-in attempt	Information only.
LAN: Ethernet interface is no longer active	Information only.
LAN: Ethernet interface is now active	Information only.

- **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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
No ISMP Gateway defined for the interconnect network. RSA *x* is Assuming the Gateway	Information only.
OS Watchdog response disabled by *x*	Information only.
OS Watchdog response enabled by *x*	Information only.
PFA Alert, see preceding error in system error log	Information only. See the preceding entry in the system-error log.
Possible ASM reset occurred -- reason unknown	Information only.
Power off	Information only.
Power on	Information only.
PPP[*xxx*] PPP-Cfg, Local-IP@=*aaa.aaa.aaa.aaa*, Remote-IP@=*bbb.bbb.bbb.bbb* NetMsk=*ccc.ccc.ccc.ccc*, Auth=*ddd*	Information only.
PPP_1:Client Connected at *xxx* bps	Information only.
PPP_1:User requested to abort PPP interface	Information only.
Received alert from system *x*; type:*y*, sender's ID:*z*	Information only.
Remote access attempt failed	Information only.
Remote access attempt failed. Invalid userid or password received. Userid is '*x*' from WEB browser at IP@=*yyy.yyy.yyy.yyy*	Information only.
Remote access attempt failed. Invalid userid or password received. Userid is '*x*' from CMD mode client at IP@=*yyy.yyy.yyy.yyy*	Information only.
Remote access attempt failed. Invalid userid or password received. Userid is '*x*' from TELNET client at IP@=*yyy.yyy.yyy.yyy*	Information only.
Remote Login Successful. Login ID:	Information only.
Remote Login Successful. Login ID:'*x*' from CMD mode client at IP@=*yyy.yyy.yyy.yyy*	Information only.
Retried alert accepted from system *x*; type:*y*, sender's ID:*z*	Information only.
Retry count exceeded. Incorrect password entered too many times for userid *w*, *x*, *y*, *z*	Information only.
RS485 broadcast from *x* ignored; more than *y* devices present on the RS485 network	Information only.
RS485 connection to system *x* has ended	Information only.
RS485 network overload has cleared; *x* or fewer devices are present on the RS485 network	Information only.
RSA *x* Became the ISMP Gateway	Information only.

- **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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
Running the backup ASM main application	Information only.
Secondary Device Event[00 *x* UNKNOWN-*y*]	Information only.
Sending alert to remote system *x*; type:*y*, ID:*z*	Information only.
Serial tamper delay triggered. Possible serial port break-in attempt	Information only.
System board is over recommended temperature	1. Make sure that the fans have good airflow and are not obstructed. 2. (Trained service technician only) Replace the system board.
System board is under recommended temperature	1. Make sure that the fans have good airflow and are not obstructed. 2. (Trained service technician only) Replace the system board.
System Complex Powered Down	Information only.
System error log full	Clear the current logs.
System is over recommended voltage for +3.3V	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System is over recommended voltage for 1.5V CPU	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System is over recommended voltage on VRM 1	(Trained service technician only) Reseat the microprocessor.
System is under recommended voltage for +3.3V	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System is under recommended voltage for 1.5V CPU	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System is under recommended voltage on VRM 1	(Trained service technician only) Reseat the microprocessor.
System log 75% full	Clear the current logs.
System log cleared	Information only.

- **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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
System Memory Error	1. Reseat the DIMMs. 2. Replace the DIMMs.
System over recommended voltage for +12v	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System over recommended voltage on +2.5v	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System over recommended voltage on continuous +5v	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shut off due to system board under temperature	1. Make sure that the fans have good airflow and are not obstructed. 2. (Trained service technician only) Replace the system board.
System shutoff due to +12v over voltage	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to +12v under voltage	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to +2.5v over voltage	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
System shutoff due to +2.5v under voltage	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to +3.3V over voltage	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to +3.3V under voltage	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to 1.5V CPU over voltage	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to 1.5V CPU under voltage	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to board over temperature	1. Make sure that all fans have good airflow and are not obstructed. 2. (Trained service technician only) Replace the system board.
System shutoff due to continuous +5v over voltage	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to continuous +5v under voltage	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 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, xSeries 206m Types 8485 and 8490," on page 69 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
System shutoff due to CPU over temperature	1. Make sure that the fan sink has good airflow and is not obstructed. 2. Reseat the following components: a. Fan sink cable b. (Trained service technician only) Fan sink
System shutoff due to VRM 1 over voltage	1. (Trained service technician only) Reseat the microprocessor. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. (Trained service technician only) Microprocessor b. (Trained service technician only) System board
System shutoff due to VRM 1 under voltage	1. (Trained service technician only) Reseat the microprocessor. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. (Trained service technician only) Microprocessor b. (Trained service technician only) System board
System under recommended voltage for +12v	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System under recommended voltage on +2.5v	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System under recommended voltage on continuous +5v	1. Reseat the following components: a. Hot-swap power supplies, if equipped b. (Trained service technician only) Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System *x* started a RS485 connection with us	Information only.
We started a RS485 connection with remote system *x*	Information only.
We will retry sending alert ID *x*; when accepted by a remote system, it will have a different ID	Information only.
Windows blue screen has been captured	Information only.

Solving SCSI problems

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

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

- A failing SCSI device (adapter, drive, or controller)
- An incorrect SCSI termination jumper setting
- A missing or incorrectly installed SCSI terminator
- A defective SCSI terminator
- An incorrectly installed cable
- A defective cable

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

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

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 66 for the minimum configuration).
4. Reconnect all ac power cords and turn on the server. If the server starts successfully, replace the adapters and devices one at a time until the problem is isolated.

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

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.
  - If you set the Ethernet controller to operate at 100 Mbps, you must use Category 5 cabling.
  - If you directly connect two servers (without a hub), or if you are not using a hub with X ports, use a crossover cable. To determine whether a hub has an X port, check the port label. If the label contains an X, the hub has an X port.
- Determine whether the hub supports auto-negotiation. If it does not, try configuring the integrated Ethernet controller manually to match the speed and duplex mode of the hub.
- Check the Ethernet controller LEDs on the rear panel of the server. These LEDs indicate whether there is a problem with the connector, cable, or hub.
  - The Ethernet link status LED is lit when the Ethernet controller receives a link pulse from the hub. If the LED is off, there might be a defective connector or cable or a problem with the hub.
  - The Ethernet transmit/receive activity LED is lit when the Ethernet controller sends or receives data over the Ethernet network. If the Ethernet transmit/receive activity light is off, make sure that the hub and network are operating and that the correct device drivers are installed.
- Check the LAN activity LED on the rear of the server. The LAN activity LED is lit when data is active on the Ethernet network. If the LAN activity LED is off, make sure that the hub and network are operating and that the correct device drivers are installed.
- 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 42.

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, use the clear CMOS jumper (JP2) to clear the CMOS memory; see “System-board jumpers” on page 11. If you suspect that the BIOS code is damaged, see “Recovering from a BIOS update failure” on page 55.

Check the LEDs on all the power supplies. 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 one 512 MB DIMM on the system board.
   - Service processor.

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

- One microprocessor
- One 512 MB DIMM on the system board
- One power supply
- Power cord
- System board

4. Turn on the server. If the problem remains, suspect the following components in the following order:
   a. System board
   b. Memory module
   c. Microprocessor
   d. PCI-X expansion card

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 system board or PCI-X expansion 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.

Calling IBM for service

See Appendix A, “Getting help and technical assistance,” on page 143 for information about calling IBM for service.

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

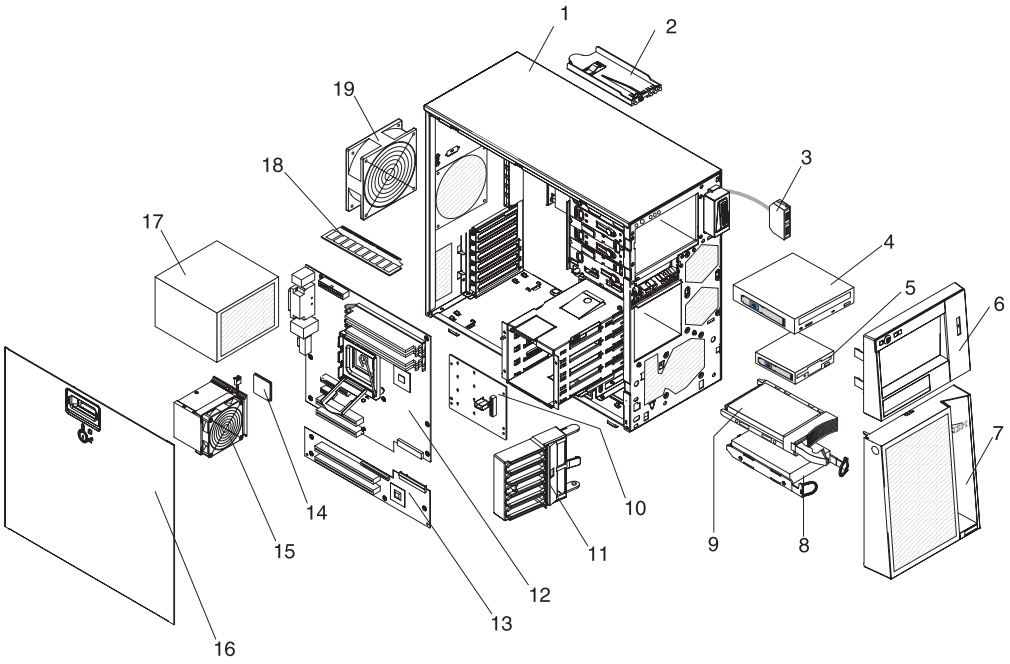
- Machine type and model
- Microprocessor and hard disk drive upgrades
- Failure symptoms
  - Does the server fail the diagnostic programs? If so, what are the error codes?
  - What occurs? When? Where?
  - Is the failure repeatable?
  - Has the current server configuration ever worked?
  - What changes,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

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

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

Chapter 3. Parts listing, xSeries 206m Types 8485 and 8490

The following replaceable components are available for the xSeries 206m Types 8485 and 8490 servers (models 10X, 1AX, 20X, 2AX, 3AX, 3BX, 70X, and 80X).



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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 8485 and 8490

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
1	Chassis assembly, non-redundant power supply (models 10X, 1AX, 20X, 2AX, 3AX)			25R8834
1	Chassis assembly, redundant power supplies (models 3BX, 70X, 80X)			39R9371
2	Front-panel assembly		25R8866	
3	Front USB connector assembly		26K6096	
4	CD-ROM drive, 48X, BTC	71P7377		
4	CD-ROM drive, 48X, HLDS	26K5379		
4	CD-ROM drive, 48X, HLDS	71P7375		
4	CD-ROM drive, 48X, Samsung	71P7385		
4	CD-RW drive, 48/32/48X	71P7347		
4	CD-RW drive, 48/32/48X	71P7349		
4	CD-RW drive, 48X (alternate)	39M3509		
4	CD-RW drive, 48X (primary)	39M3511		
4	DVD-RAM drive, Rambo 6 HLDS (optional)	26K5441		
4	DVD-RAM drive, Rambo 6 Panasonic (optional)	26K5443		
4	DVD-RAM drive, Rambo IV (optional)	26K5383		
4	DVD-ROM drive, 16/48 HLDS (optional)	26K5435		
4	DVD-ROM drive, 16/48 HLDS (optional)	39M3515		
4	DVD-ROM drive, 16/48 Samsung (optional)	26K5385		
4	DVD-ROM drive, 16X Liteon (optional)	33P3237		
4	DVD/CD-RW drive (optional)	26K5381		
4	DVD/CD-RW drive (optional)	26K5429		
4	DVD/CD-RW drive (optional)	39M3539		
5	Diskette drive (optional)	33P3343		
6	Bezel, upper	25R8835		
7	Bezel, lower	25R8822		

Table 3. Parts listing, Types 8485 and 8490 (continued)

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
8	Hard disk drive, SATA, 80 GB, fixed/simple-swap, with tray (models 10X, 20X)	39M4503		
8	Hard disk drive, SATA, 160 GB, fixed/simple-swap, with tray (optional)	39M4507		
8	Hard disk drive, SATA, 250 GB, fixed/simple-swap, with tray (optional)	39M4511		
9	Hard disk drive, SAS, 73 GB, 10 K, hot-swap, with tray (optional)	26K5712		
9	Hard disk drive, SAS, 146 GB, 10 K, hot-swap, with tray (optional)	26K5713		
9	Hard disk drive, SAS, 300 GB, 10 K, hot-swap, with tray (optional)	26K5714		
9	Hard disk drive, SAS, 36 GB, 15 K, hot-swap, with tray (optional)	26K5700		
9	Hard disk drive, SAS, 73 GB, 15 K, hot-swap, with tray (optional)	26K5701		
9	Hard disk drive, SAS, 146 GB, 15 K, hot-swap, with tray (optional)	26K5702		
9	Hard disk drive, SATA, 80 GB, hot-swap, with tray (optional)	39M4521		
9	Hard disk drive, SATA, 160 GB, hot-swap, with tray (optional)	39M4525		
9	Hard disk drive, SATA, 250 GB, hot-swap, with tray (optional)	39M4529		
10	SAS backplane (models 3AX, 3BX, 70X, 80X)		25R8113	
11	Front adapter-retention bracket			13N2993
12	System board assembly			39M4477
13	Expansion card, system board (models 3AX, 3BX, 70X, 80X)		39M4478	
14	Microprocessor, 800/3.0 GHz – 1 MB (model 10X)			39M4460
14	Microprocessor, 800/3.0 GHz – 2 MB (model 1AX)			39M4472
14	Microprocessor, 800/3.2 GHz – 2 MB (models 20X, 2AX)			39M4473
14	Microprocessor, 800/3.4 GHz – 2 MB (models 3AX, 3BX)			39M4474
14	Microprocessor, dual core, 800/2.8 GHz – 2 MB (model 70X)			39M4475
14	Microprocessor, dual core, 800/3.0 GHz – 2 MB (model 80X)			39M4476
15	Fan sink			39R9308
16	Cover, side	25R8836		
17	Power supply, non-redundant 400 watt (models 10X, 1AX, 20X, 2AX, 3AX)			24R2666
18	Memory, 512 MB 533/667 MHz PC2-4200 ECC	30R5151		
18	Memory, 1 GB 533/667 MHz PC2-4200 ECC (optional)	30R5152		

Table 3. Parts listing, Types 8485 and 8490 (continued)

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
18	Memory, 2 GB 533/667 MHz PC2-4200 ECC (optional)	30R5153		
19	System fan, rear		25R8829	
	Air duct, hard disk drive cage (models 3AX, 3BX, 70X, 80X)	39R9322		
	Backplate, simple-swap (models 1AX, 2AX)		25R8842	
	Battery, 3.0 volt		33F8354	
	Bezel kit	13N2450		
	Bezel, diskette drive (optional)	25R8857		
	Cable, 24-inch SATA signal (models 10X, 20X)		25R5635	
	Cable, 400 watt DAS (model 3AX)		25R8849	
	Cable, diskette drive (optional)		39R8112	
	Cable, IDE signal		13N2466	
	Cable, panel mount (models 1AX, 2AX)		13N2413	
	Cable, SAS 4X signal (models 3AX, 3BX, 70X, 80X)		25R8853	
	EMC I/O shield	25R8843		
	EMC shield kit			13N2997
	Foot	13N2985		
	Hard disk drive cage	25R8838		
	Keyboard, US	39M6989		
	Keylock, keyed-alike (models 10X, 1AX, 20X, 2AX, 3AX)		26K7363	
	Keylock, keyed-random (models 3BX, 70X, 80X)		26K7364	
	Kit, hardware			26K7305
	Mouse, 2-button	39M6976		
	Mouse, optical, 3-button (optional)	39M6984		
	Panel, access	25R8859		
	Power supply cage (models 3BX, 70X, 80X)		24R2682	
	Power supply, redundant 430 watt (models 3BX, 70X, 80X)	24R2679		
	Retainer, device	39R9369		
	Retention module, fan sink			25R8873
	SAS mini-PCI-X adapter (models 3AX, 3BX, 70X, 80X)		39M4338	
	System fan, front, 80 x 38 (models 3AX, 3BX, 70X, 80X)		25R8830	
	System service label	25R8841		
	Tray (models 10X, 20X)			25R8864

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
02K0546	China
13F9940	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea
13F9979	Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic of), Congo (Republic of), Cote D'Ivoire (Ivory Coast), Croatia (Republic of), Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Guyana, French Polynesia, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Laos (People's Democratic Republic of), Latvia, Lebanon, Lithuania, Luxembourg, Macedonia (former Yugoslav Republic of), Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova (Republic of), Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Reunion, Romania, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia (Republic of), Somalia, Spain, Suriname, Sweden, Syrian Arab Republic, Tajikistan, Tahiti, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis and Futuna, Yugoslavia (Federal Republic of), Zaire
13F9997	Denmark
14F0015	Bangladesh, Lesotho, Macao, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda

IBM power cord part number	Used in these countries and regions
14F0033	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dominica, Gambia, Ghana, Grenada, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Polynesia, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad and Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Italy, Libyan Arab Jamahiriya
14F0087	Israel
1838574	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Colombia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Taiwan, United States of America, Venezuela
24P6858	Korea (Democratic People's Republic of), Korea (Republic of)
34G0232	Japan
36L8880	Argentina, Paraguay, Uruguay
49P2078	India
49P2110	Brazil
6952300	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States of America, Venezuela

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, xSeries 206m Types 8485 and 8490,” on page 69 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 remove or replace a component, read the following information:

- Read the safety information that begins on page vii and the guidelines in “Handling static-sensitive devices” on page 77. This information will help you work safely.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- If you must start the server while the cover is removed, make sure that no one is near the server and that no 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 stand safely without slipping.
  - Distribute the weight of the object equally between your feet.
  - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
  - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles
- Make sure that you have an adequate number of properly grounded electrical outlets for the server, monitor, and other devices.
- Back up all important data before you make changes to disk drives.
- Have a small flat-blade screwdriver available.
- You do not have to turn off the server to install or replace hot-swap power supplies, hot-swap fans, hot-plug adapters, or hot-plug Universal Serial Bus (USB) devices. However, you must turn off the server before performing any steps that involve removing or installing adapter cables.
- 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

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hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.

- When you are finished working on the server, reinstall all safety shields, guards, labels, and ground wires.
- For a list of supported options for the server, see http://www.ibm.com/servers/eserver/serverproven/compat/us/.

System reliability guidelines

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

- Each of the drive bays has a drive or a filler panel 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 turning on the server. Operating the server for extended periods of time (more than 30 minutes) with the server cover removed might damage server components.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan within 48 hours.
- You have replaced a hot-swap drive within 10 minutes of removal.
- You do not run the server without the air baffle installed. Operating the server without the air baffle might cause the microprocessor to overheat.
- The microprocessor socket always contains a microprocessor and fan sink.
- For redundant and hot-swappable 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 could result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when working inside the server with the power on.

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

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

Handling static-sensitive devices

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

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

- Limit your movement. Movement can cause static electricity to build up around you.
- The use of a grounding system is recommended. For example, wear an electrostatic-discharge wrist strap, if one is available. Always use an electrostatic-discharge wrist strap or other grounding system when working inside the server with the power on.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal part on the outside of the server for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the server without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the server cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Returning a device or component

If you are instructed to return a device or component, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Removing and replacing Tier 1 CRUs

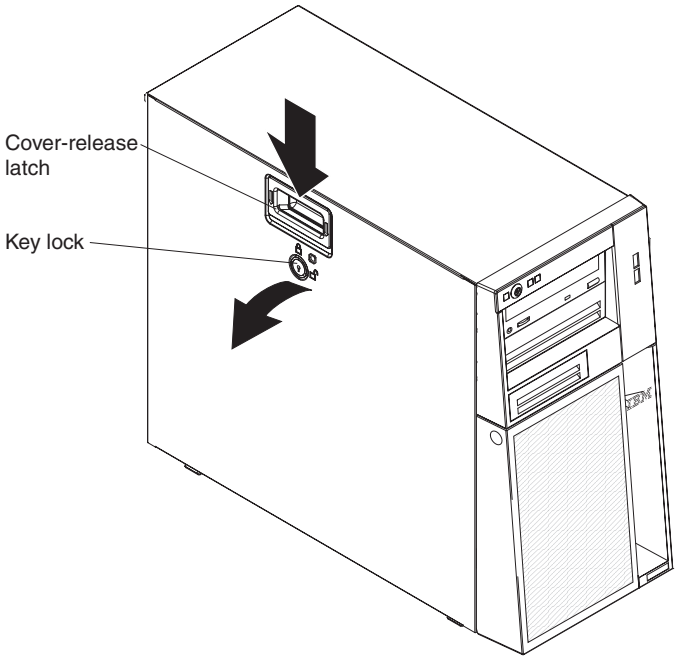
Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

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

Removing the side cover

Attention: Operating the server for more than 30 minutes with the side cover removed might damage server components. For proper cooling and airflow, replace the side cover before turning on the server.

To remove the side cover, complete the following steps.

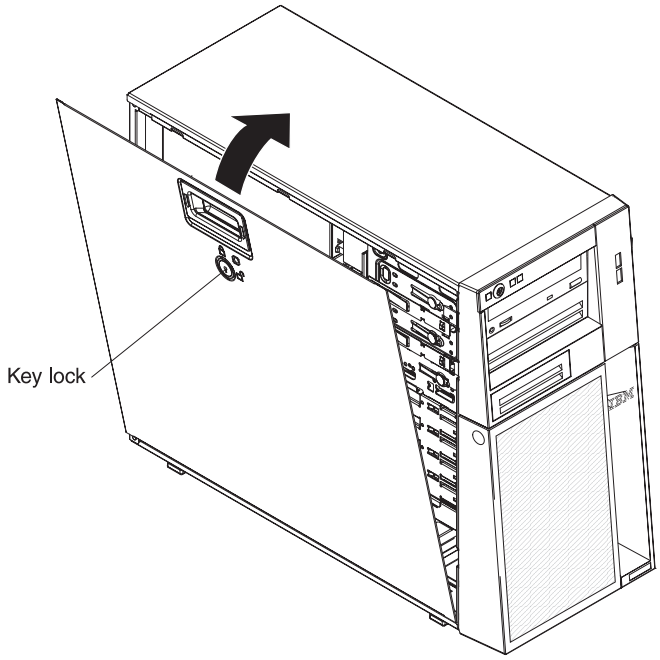


1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. If you are replacing a non-hot-swap component, turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock the side cover.
4. Press the cover-release latch down, as indicated by the two arrows on the latch, and tilt the top of the side cover away from the chassis.
5. Lift the side cover off the server and set it aside.
6. If you are instructed to return the side cover, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the side cover

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

To install the side cover, complete the following steps.



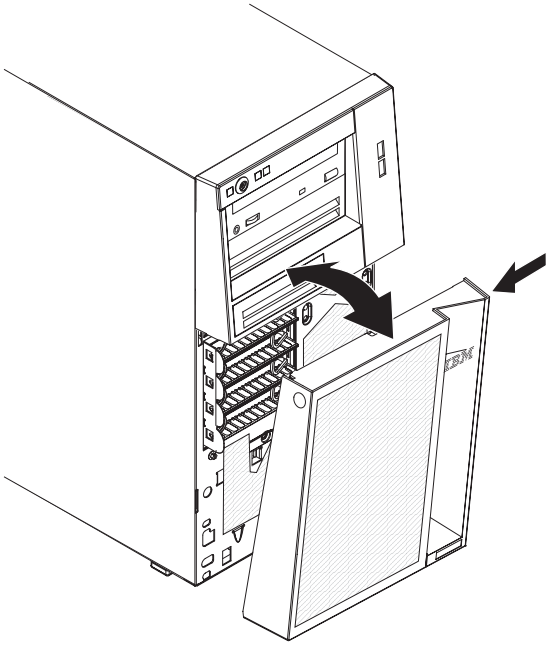
1. Make sure that all cables, adapters, and other components are installed and seated correctly and that you have not left loose tools or parts inside the server. Also, make sure that all internal cables are correctly routed.
2. If you removed the upper and lower bezels, reinstall them before you replace the side cover (see “Installing the upper bezel” on page 83 and “Installing the lower bezel” on page 81).

   Important: The cover lock must be in the unlocked (opened) position before you install the side cover.
3. Position the lip on the bottom edge of the side cover on the ledge on the bottom of the chassis; then, tilt the top of the cover into position on the chassis until it latches securely into place.
4. Lock the side cover if it was unlocked during removal.
5. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the lower bezel

When working with some devices, such as the drives in bays 4 through 7, you must first remove the lower bezel to access the devices.

To remove the lower bezel, complete the following steps.

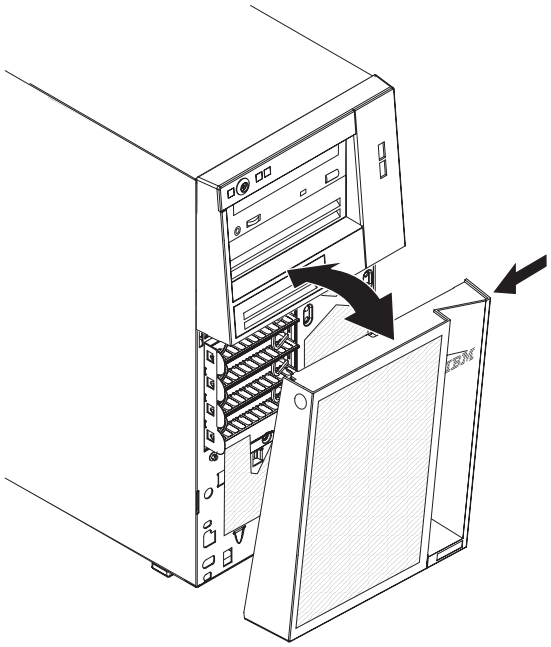


1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. If you are replacing a non-hot-swap component, turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock the side cover.

   Note: You do not have to remove the side cover to remove the lower bezel.
4. Press the round blue release button on the right side of the lower bezel and tilt the lower bezel forward to disengage it from the chassis.
5. Lift the lower bezel to disengage the two bottom tabs from the chassis.
6. If you are instructed to return the lower bezel, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the lower bezel

To install the lower bezel, complete the following steps.

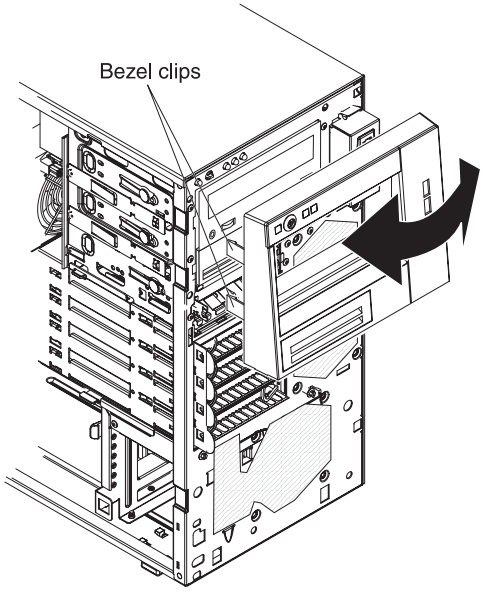


1. Insert the two bottom tabs on the lower bezel into the corresponding holes in the front of the chassis.
2. Press the top of the lower bezel into position on the chassis until it locks securely into place.
3. Lock the side cover if it was unlocked during removal.
4. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the upper bezel

When working with some devices, such as the drives in bays 1 through 3, you must first remove the upper bezel to access the devices.

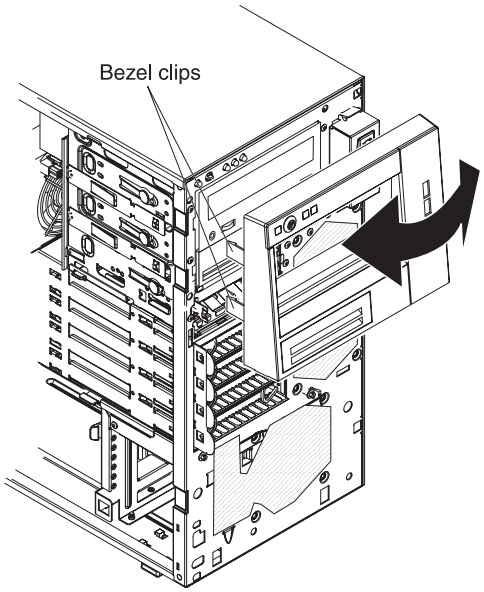
To remove the upper bezel, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. If you are replacing a non-hot-swap component, turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Remove the lower bezel (see “Removing the lower bezel” on page 80).
5. Carefully pull the two bezel clips on the left side of the upper bezel away from the chassis; then, rotate the upper bezel to the right side of the server to disengage the two right-side tabs from the chassis.
6. If you are instructed to return the upper bezel, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the upper bezel

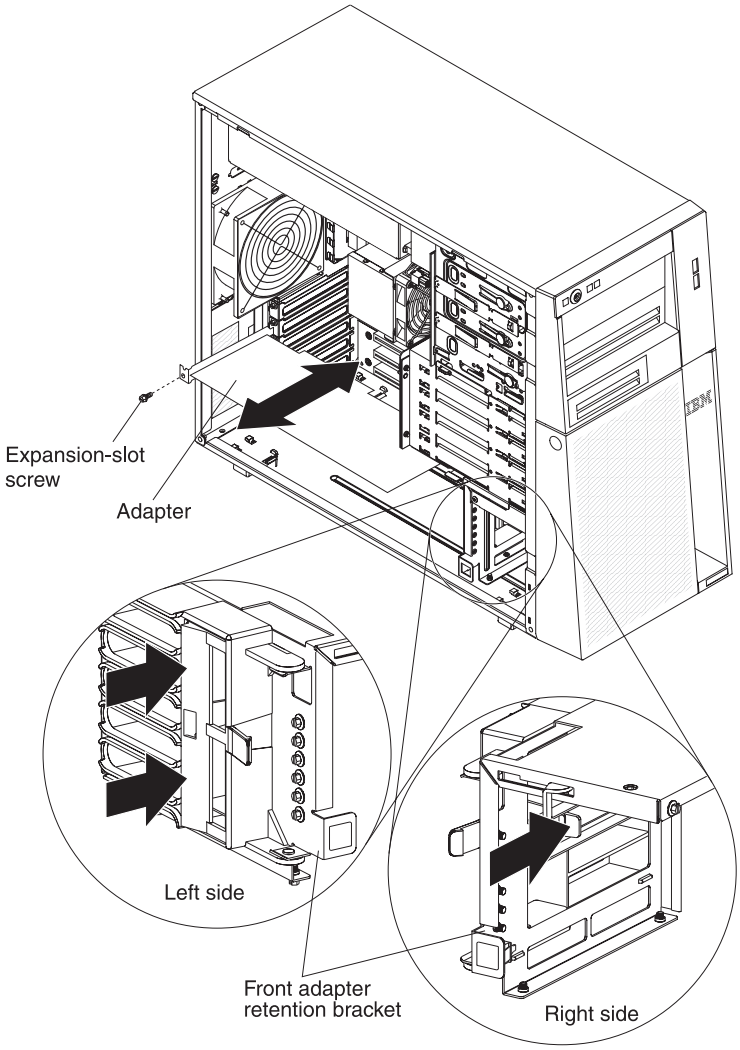
To install the upper bezel, complete the following steps.



1. Insert the two right-side tabs on the upper bezel into the corresponding holes on the right side of the chassis.
2. Rotate the upper bezel to the left side of the chassis and press the bezel clips onto the corresponding indentations on the left side of the chassis.
3. Install the lower bezel (see “Installing the lower bezel” on page 81).
4. Install the side cover (see “Installing the side cover” on page 79).
5. Lock the side cover if it was unlocked during removal.
6. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing an adapter

To remove an adapter, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Disconnect any cables to the adapter or any cables that impede access to the adapter.
5. If you are removing a full-length adapter, press on the retaining tab on the left side of the front adapter-retention bracket until the release lever on the right side of the bracket clicks into place.
6. Remove the expansion-slot screw at the rear of the adapter.
7. Carefully grasp the adapter by its top edge or upper corners, and pull the adapter from the server.

   Attention: Expansion-slot covers must be installed in all empty slots. This maintains the electronic emissions standards of the computer and ensures proper ventilation of computer components.

8. If the adapter is not being replaced, install an expansion-slot cover in the expansion-slot opening.
9. If you are instructed to return the adapter, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

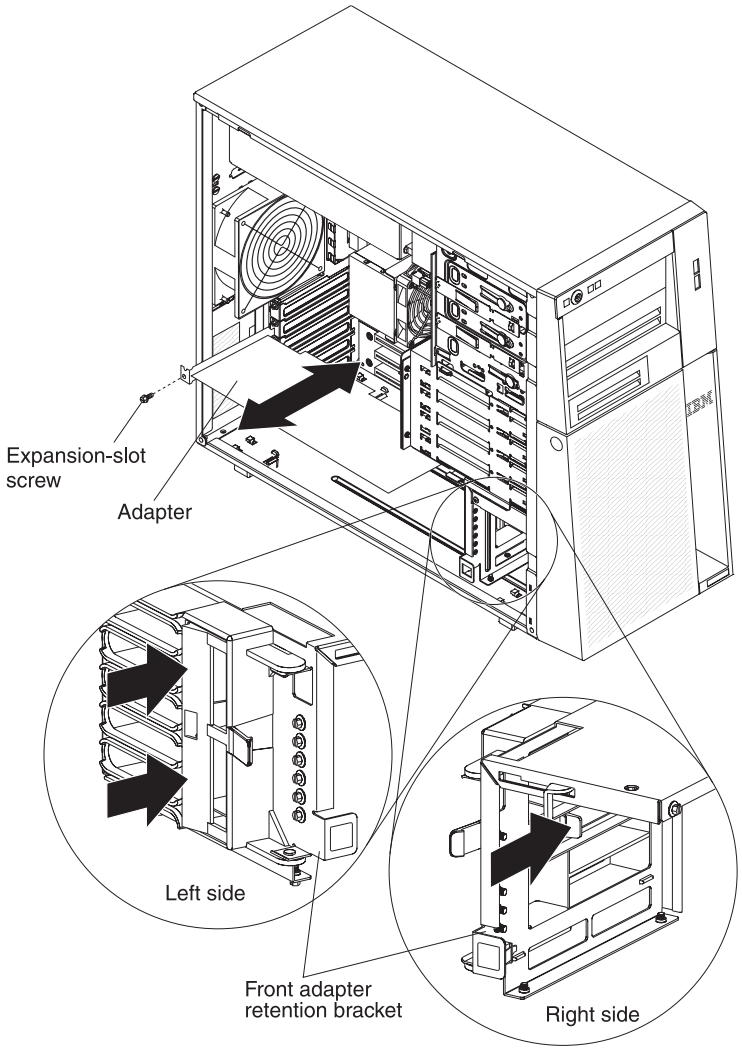
Installing an adapter

For information about the types of adapters that the server supports and other information that you might consider when installing an adapter, see the *User's Guide*. See "System-board option connectors" on page 9 for the locations of the expansion slots on the system board and on the optional PCI-X Expansion Card.

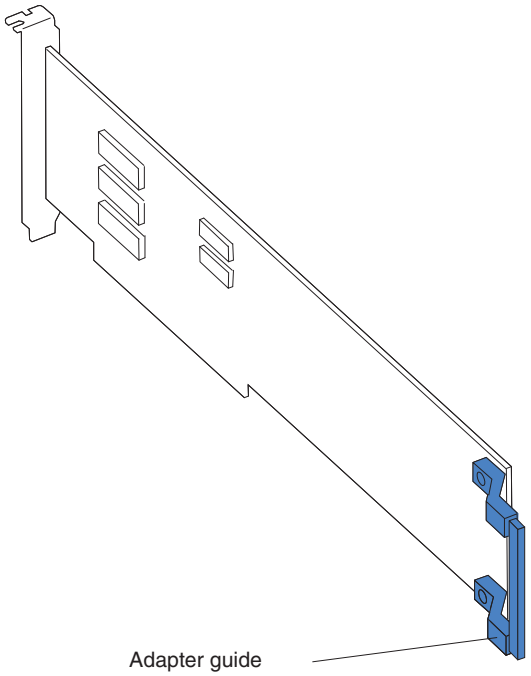
Notes:

1. If you are replacing a Remote Supervisor Adapter II, it must be installed in PCI slot 3 or 4, and the cable must be connected to the Remote Supervisor Adapter II cable connector on the system board (see "System-board option connectors" on page 9).
2. When you start the server for the first time after installing a Remote Supervisor Adapter II, the startup process will take several minutes longer than a typical startup.

To install a replacement adapter, complete the following steps.



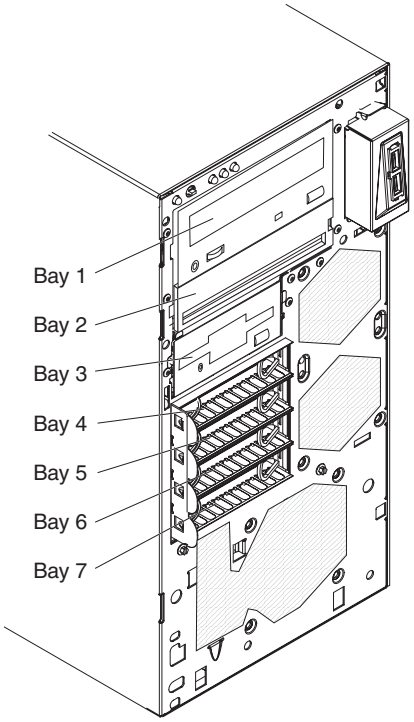
1. Check the instructions that come with the adapter for any requirements, restrictions, or cabling instructions. It might be easier to route cables before you install the adapter.
2. Follow the instructions that come with the adapter to set jumpers or switches, if any.
3. Touch the static-protective package that contains the adapter to any unpainted metal surface on the server. Then, remove the adapter from the static-protective package. Avoid touching the components and gold-edge connectors on the adapter.
4. If you are installing a full-length adapter, remove the blue adapter guide (if any) from the end of the adapter.



5. Carefully grasp the adapter by the top edge or upper corner, and move the adapter directly from the static-protective package to the adapter slot. Align the adapter with the expansion slot guides; then, press the adapter firmly into the expansion slot. For full-length adapters, make sure that the front edge of the adapter is properly seated in the correct slot in the front adapter-retention bracket.
6. Install an expansion-slot screw at the rear of the adapter.
7. If you are installing a full-length adapter, press on the release lever on the right side of the front adapter-retention bracket to release the retaining tab on the left side of the bracket.
8. Connect required cables to the adapter. Route cables so that they do not block the flow of air from the fans.
9. Install the side cover (see “Installing the side cover” on page 79).
10. Lock the side cover if it was unlocked during removal.
11. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

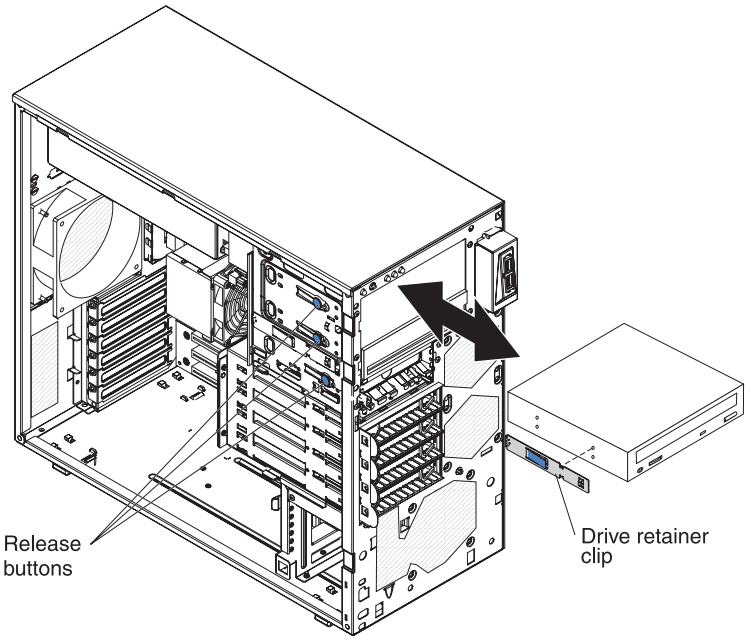
Removing and installing internal drives

See the *User's Guide* for information about the types of drives that the server supports. The following figure shows the location of the drive bays in the server.



Removing a drive from bay 1, 2, or 3

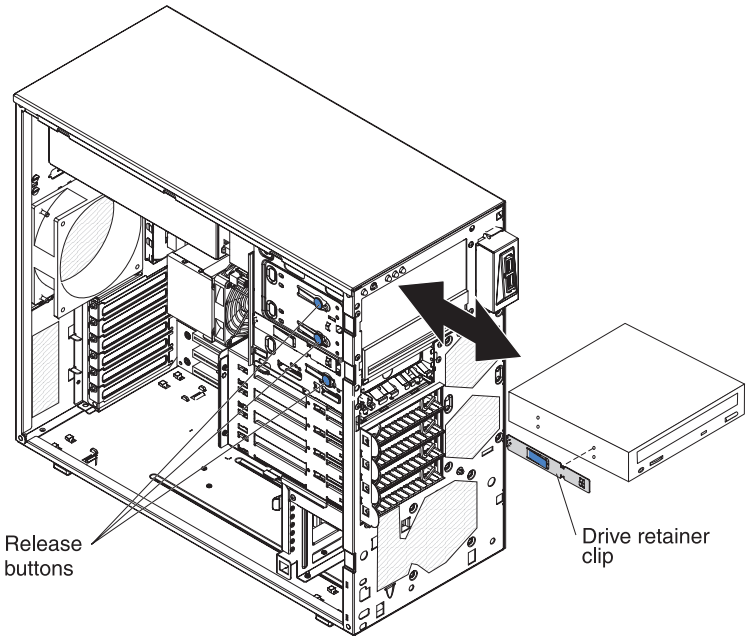
To remove a drive from bay 1, 2, or 3, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Remove the lower bezel (see “Removing the lower bezel” on page 80).
5. Remove the upper bezel (see “Removing the upper bezel” on page 82).
6. Disconnect the power and signal cables from the drive that is to be removed.
7. To remove the drive, use one of the following procedures:
   - For a drive in bay 1 or 2, or a diskette drive in bay 3, press and hold the blue release button on the side of the bay to release the drive; then, pull the drive out of the front of the server.
   - For a hard disk drive in bay 3, remove the two mounting screws on the side of the bay and pull the drive out of the rear of the bay.
8. Remove the drive retainer clip from the side of the drive. Save the clip to use when you install the replacement drive.
9. If you are instructed to return the drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a drive in bay 1, 2, or 3

To install a drive in bay 1, 2, or 3, complete the following steps.



1. If you are replacing a removed drive with a new drive, make sure that:
   - You have all the cables and other equipment that is specified in the documentation that comes with the new drive.
   - You check the instructions that come with the new drive to determine whether you must set any switches or jumpers on the drive.
   - You have removed the drive retainer clip on the side of the old drive and have it available for installation on the new drive.

   Note: If you are installing a drive that contains a laser, observe the following safety precaution.
   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

2. Touch the static-protective package that contains the new drive to any unpainted metal surface on the server; then, remove the drive from the package and place it on a static-protective surface.
3. Follow the instructions that come with the drive to set jumpers or switches, if there are any.

   Note: You might find it easier to install the new drive from the front and then attach the cables.
4. If you are installing a 3.5-in. drive in bay 2, attach a 5.25-in. conversion kit to the 3.5-in. drive.

   Note: A diskette drive can be installed only in bay 3.
5. To insert the drive, use one of the following procedures:
   - For a drive in bay 1 or 2, or a diskette drive in bay 3, install the blue drive retainer clip into the screw holes on the side of the drive; then, push the drive into the front of the bay until it clicks into place
   - For a hard disk drive in bay 3, push the drive into the rear of the bay; then, install the two screws through the side of the drive cage.
6. Reconnect the power and signal cables to the drive.

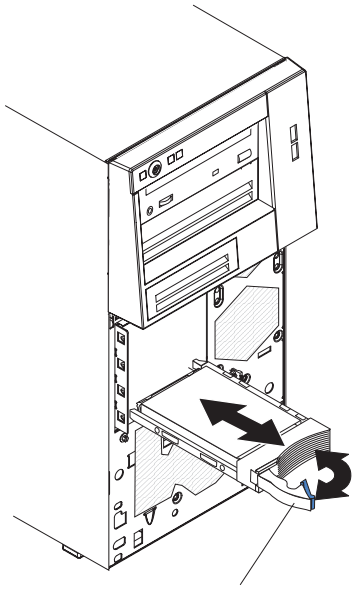
   Note: Route the signal cable so that it does not block the airflow to the rear of the drives or over the microprocessor and dual inline memory modules (DIMMs).
7. Install the upper bezel (see “Installing the upper bezel” on page 83).
8. Install the lower bezel (see “Installing the lower bezel” on page 81).
9. Install the side cover (see “Installing the side cover” on page 79).
10. Lock the side cover if it was unlocked during removal.
11. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing a hot-swap hard disk drive from bay 4, 5, 6, or 7

This procedure applies only to server models that have hot-swap hard disk drives.

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

To remove a hot-swap hard disk drive from bay 4, 5, 6, or 7, complete the following steps.



Drive tray handle
(in open position)

1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.

   Note: You do not have to turn off the server to remove hot-swap drives from the hot-swap drive bays.
2. Unlock the side cover. The side cover does not have to be removed.
3. Remove the lower bezel (see “Removing the lower bezel” on page 80).
4. Rotate the drive tray handle of the drive assembly to be removed to the open position.
5. Grasp the handle of the drive assembly to be replaced and pull the assembly out of the bay.
6. If you are instructed to return the drive assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

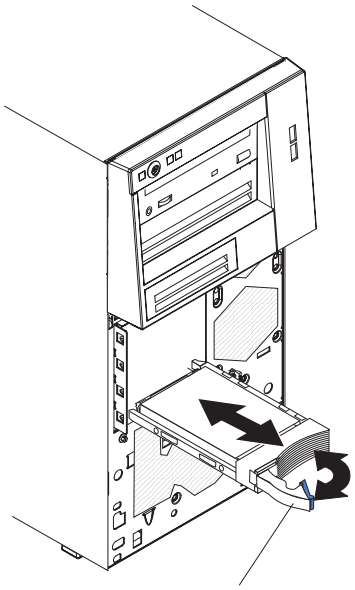
Installing a hot-swap hard disk drive in bay 4, 5, 6, or 7

This procedure applies only to server models that have hot-swap hard disk drives. Before installing a hot-swap hard disk drive, read the following information:

- The hot-swap drives must be either all SAS hard disk drives or all SATA hard disk drives; the two types cannot be combined.
- Inspect the drive tray for signs of damage.
- To maintain proper system cooling, do not operate the server for more than 10 minutes without either a drive or a filler panel installed in each drive bay.
- You do not have to turn off the server to install hot-swap drives in the hot-swap drive bays.

Note: If you install the maximum number of hot-swap hard disk drives (four), remove the EMC shield that is attached inside the lower bezel.

To install a hot-swap hard disk drive in bay 4, 5, 6, or 7, complete the following steps.



Drive tray handle
(in open position)

1. Touch the static-protective package that contains the drive to any unpainted metal surface on the server; then, remove the drive from the package and place it on a static-protective surface.
2. Make sure that the drive tray handle is in the open position.
3. Align the drive assembly with the guide rails in the bay; then, carefully slide the drive assembly into the drive bay until the drive stops.
4. Rotate the drive tray handle to the closed position.

5. Check the hard disk drive status indicator to make sure that the hard disk drive is operating correctly. (You might have to restart the server for the drive to be recognized.) If the amber hard disk drive status LED for a drive is lit continuously, it indicates that the drive is faulty and must be replaced. If the green hard disk drive activity LED is flashing, this indicates that the drive is being accessed.

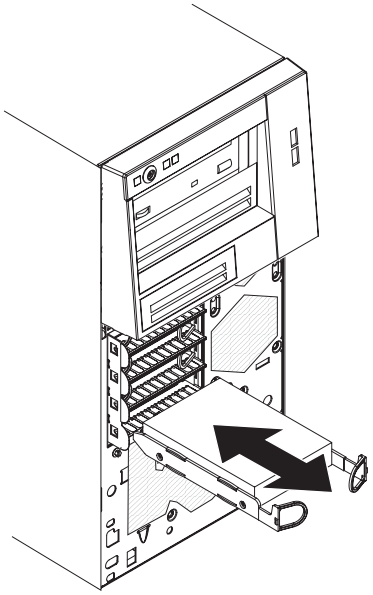
   Note: If the server is configured for RAID operation using an optional ServeRAID controller, you might have to reconfigure the disk arrays after replacing hard disk drives. See the ServeRAID documentation for additional information about RAID operation and complete instructions for using ServeRAID Manager.
6. Install the lower bezel (see “Installing the lower bezel” on page 81).
7. Lock the side cover if it was unlocked during removal.

Removing a simple-swap hard disk drive from bay 4, 5, 6, or 7

This procedure applies only to server models that have simple-swap SATA hard disk drives.

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

To remove a simple-swap hard disk drive from bay 4, 5, 6, or 7, complete the following steps.



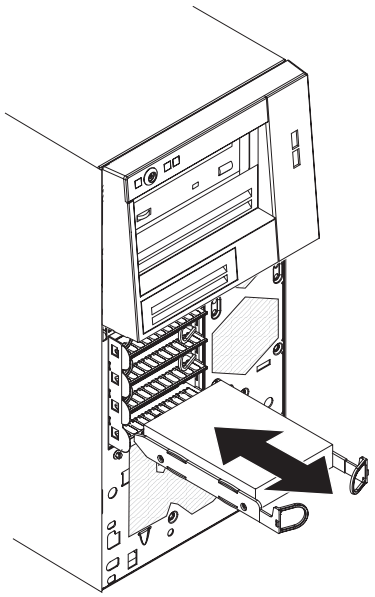
1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock the side cover. The side cover does not have to be removed.
4. Remove the lower bezel (see “Removing the lower bezel” on page 80).
5. Pull the loops of the drive assembly that is to be removed toward each other; then, pull the assembly out of the bay.
6. If you are instructed to return the drive assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a simple-swap hard disk drive in bay 4, 5, 6, or 7

This procedure applies only to server models that have simple-swap SATA hard disk drives.

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

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



1. Touch the static-protective package that contains the drive to any unpainted metal surface on the server; then, remove the drive from the package and place it on a static-protective surface.
2. Align the drive assembly with the guide rails in the bay.
3. Pull the loops of the drive assembly toward each other; then, carefully slide the drive assembly into the drive bay until it stops and release the loops.

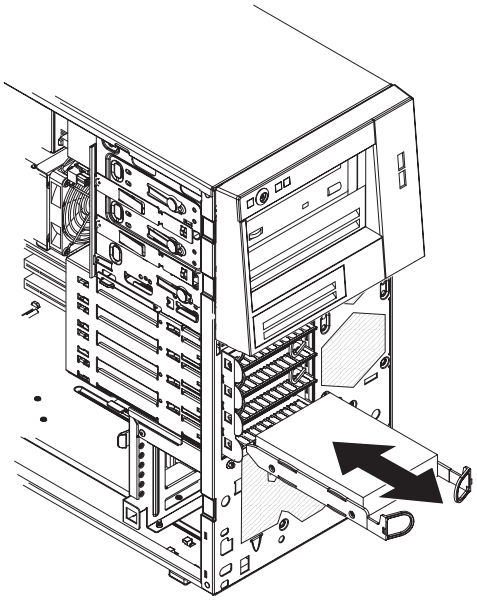
   Note: Do not release the loops on the drive assembly until it is completely seated.
4. Install the lower bezel (see “Installing the lower bezel” on page 81).
5. Lock the side cover if it was unlocked during removal.
6. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing a non-hot-swap hard disk drive from bay 4, 5, 6, or 7

This procedure applies only to server models that have non-hot-swap SATA hard disk drives.

Attention: Disconnect all power from the server before removing or installing a non-hot-swap hard disk drive.

To remove a non-hot-swap hard disk drive, complete the following steps.



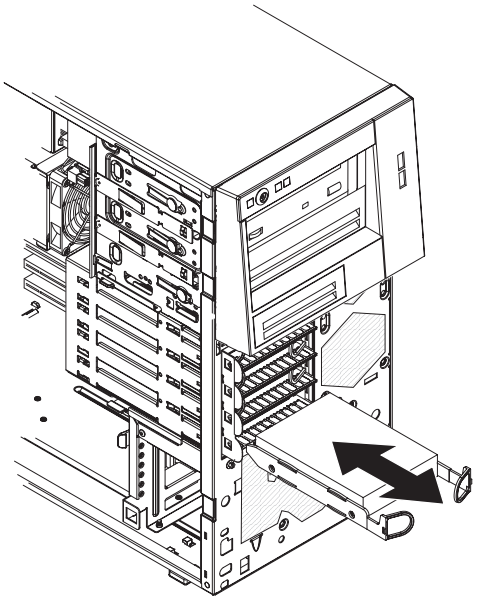
1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Remove the lower bezel (see “Removing the lower bezel” on page 80).
5. Disconnect the power and signal cables from the rear of the drive that is to be removed.
6. Pull the loops of the drive assembly that is to be removed toward each other; then, pull the assembly out of the bay.
7. If you are instructed to return the drive assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a non-hot-swap hard disk drive in bay 4, 5, 6, or 7

This procedure applies only to server models that have non-hot-swap SATA hard disk drives.

Attention: Disconnect all power from the server before removing or installing a non-hot-swap hard disk drive.

To install a non-hot-swap hard disk drive, complete the following steps.



1. Touch the static-protective package that contains the drive to any unpainted metal surface on the server; then, remove the drive from the package and place it on a static-protective surface.
2. Align the drive assembly with the guide rails in the bay.
3. Pull the loops of the drive assembly toward each other; then, carefully slide the drive assembly into the drive bay until it stops and release the loops.

   Note: Do not release the loops on the drive assembly until it is completely seated.
4. Connect the power and signal cables to the rear of the drive.
5. Install the lower bezel (see “Installing the lower bezel” on page 81).
6. Install the side cover (see “Installing the side cover” on page 79).
7. Lock the side cover if it was unlocked during removal.
8. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing a hot-swap power supply

This procedure applies only to server models that have hot-swap power supplies. See “Removing a non-hot-swap power supply” on page 123 for information about the removal of a non-hot-swap power supply.

When you remove or install a hot-swap power supply, observe the following precautions.

Statement 8:

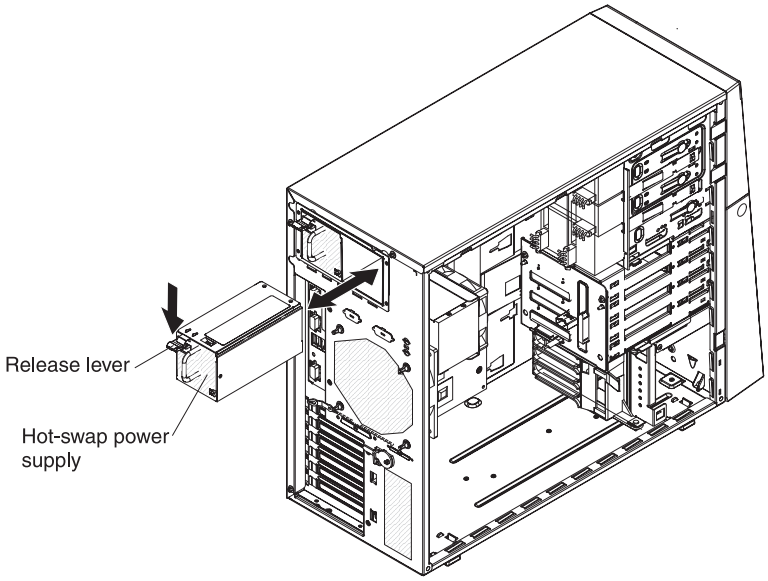


CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.



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

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

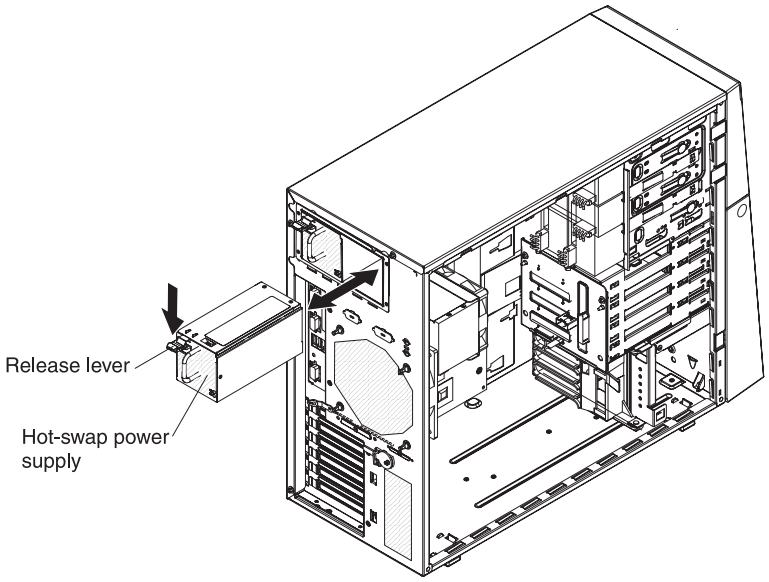


1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Disconnect the power cord from the power supply that is to be removed.
3. Press down on the orange release lever and pull the power supply out of the bay, using the handle.
4. If you are instructed to return the power supply, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a hot-swap power supply

This procedure applies only to server models that have hot-swap power supplies. See “Installing a non-hot-swap power supply” on page 125 for information about the installation of a non-hot-swap power supply.

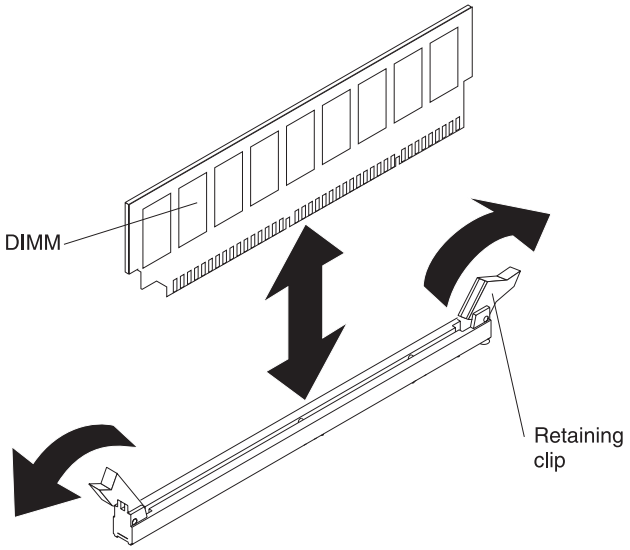
To install a hot-swap power supply, complete the following steps.



1. Place the power supply into the bay guides.
2. Using the handle, push the power supply toward the front of the chassis until it locks into place.
3. Connect one end of the power cord into the connector on the back of the power supply and connect the other end of the power cord into a properly grounded electrical outlet.
4. Make sure that both the ac and dc power LEDs on the rear of the power supply are lit, indicating that the power supply is operating correctly.

Removing a memory module

To remove a dual inline memory module (DIMM), complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Disconnect any cables that impede access to the DIMMs.
5. Locate the DIMM connector that contains the DIMM that is to be replaced (see “System-board option connectors” on page 9 for DIMM slot locations).

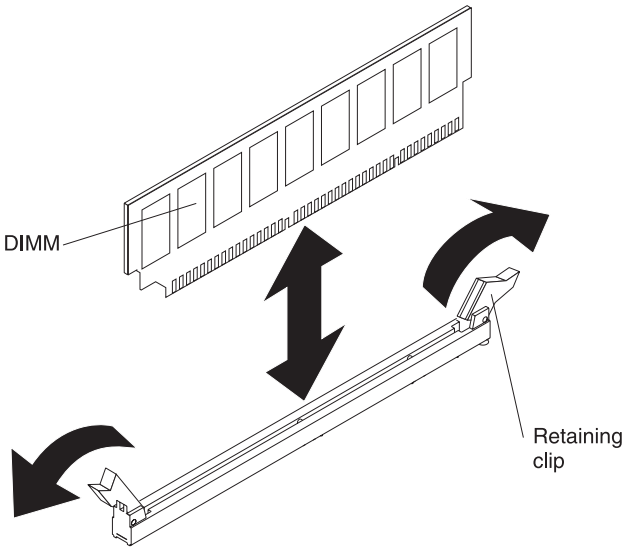
   Attention: To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.
6. Carefully open the retaining clips on each end of the DIMM connector and remove the DIMM.
7. If you are instructed to return the DIMM, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a memory module

Note: If you are replacing a faulty DIMM, make sure that the replacement DIMM is the correct type of memory. If you are adding DIMMs, install the DIMMs in the sequence shown in the following table. See the *User's Guide* for additional information about the type of memory that is compatible with the server.

Number of DIMMs	Connectors
One DIMM	1
Two DIMMs	1, 3
Three DIMMs	Not recommended
Four DIMMs	1, 3, 2, 4

To install a DIMM, complete the following steps.



1. Make sure that the retaining clips on each end of the DIMM connector are fully open.
2. Touch the static-protective package that contains the DIMM to any unpainted metal surface on the server; then, remove the new DIMM from the package.
3. Turn the DIMM so that the DIMM keys align correctly with the slot.

   Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, open and close the clips gently.
4. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is firmly seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly installed. Open the retaining clips, remove the DIMM, and then reinsert it.
5. Reconnect any cables that were disconnected during removal.
6. Install the side cover (see "Installing the side cover" on page 79).
7. Lock the side cover if it was unlocked during removal.
8. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

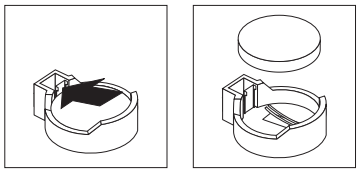
Removing and replacing Tier 2 CRUs

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 the server.

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

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 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Remove any adapters that impede access to the battery.
5. Locate the battery on the system board (see “System-board internal connectors” on page 7).
6. Remove the battery:
   a. Use a fingernail to press the top of the battery clip away from the battery. The battery pops up when released.
   b. Use your thumb and index finger to lift the battery from the socket.

Installing the battery

The following notes describe information that you must consider when replacing 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 battery, you must reconfigure the server and reset the system date and time.
- To avoid possible danger, read and follow the following safety statement.

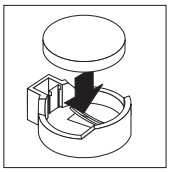
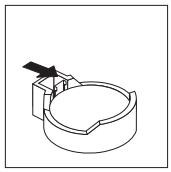
Statement 2:

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**

To install the battery, complete the following steps.

1. Follow any special handling and installation instructions that come with the replacement battery.
2. Insert the new 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 the battery clip holds the battery securely.
3. Install the side cover (see “Installing the side cover” on page 79).
4. Lock the side cover if it was unlocked during removal.
5. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.
6. Start the Configuration/Setup Utility program and reset the configuration.
   - Set the system date and time.
   - Set the power-on password.
   - Reconfigure the server.

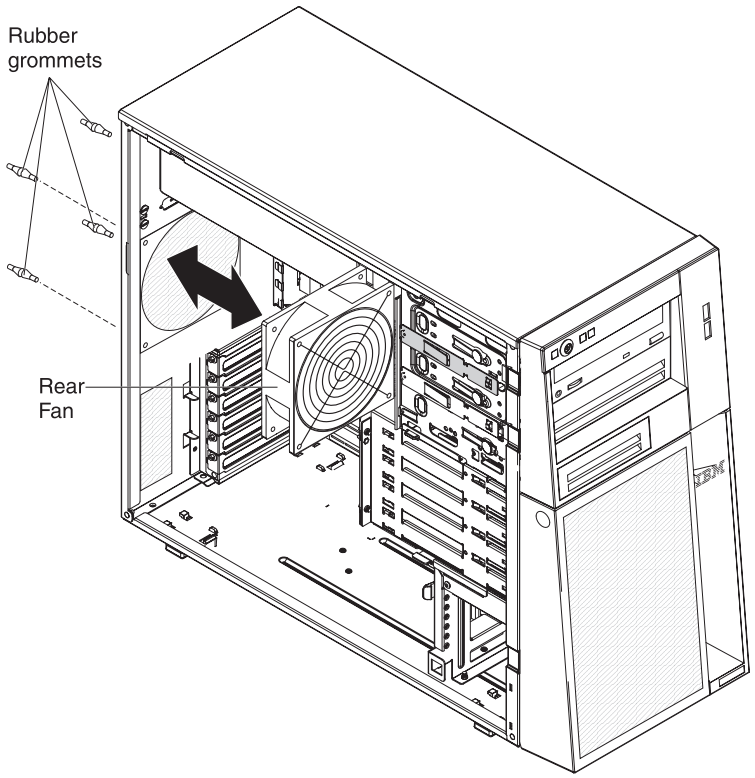
   See “Using the Configuration/Setup Utility program” on page 134 for details.

Removing the rear system fan

Attention:

- Replace a failed fan within 48 hours.
- To ensure proper cooling and airflow, do not operate the server for more than 30 minutes with the side cover removed.

To remove the rear system fan, complete the following steps.



1. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
2. Unlock and remove the side cover (see “Removing the side cover” on page 78).
3. Remove any adapters that impede access to the fan and the fan connector on the system board (see “Removing an adapter” on page 84).
4. Disconnect the fan cable from the system board, making a note of where the cable was connected, for later installation.
5. Grasp the fan with both hands and pull firmly, extending the rubber grommets. The grommets will be pulled through the holes in either the fan or the chassis and can then be removed. Save the grommets for use with the replacement fan.

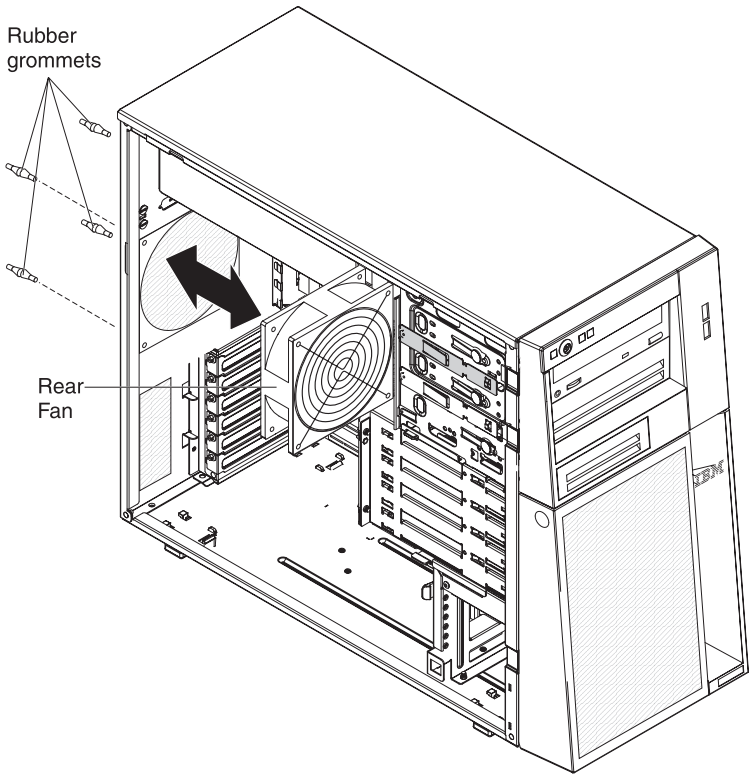
   Note: It might be easier to use side cutters to sever the grommets.
6. Pull the fan up and out of the chassis.
7. If you are instructed to return the fan, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the rear system fan

Attention:

- Replace a failed fan within 48 hours.
- To ensure proper cooling and airflow, do not operate the server for more than 30 minutes with the side cover removed.

To install the rear system fan, complete the following steps.



1. Locate the rubber grommets that you removed from the defective fan. Use needle-nosed pliers to pull the grommets through the holes in the replacement fan.
2. Position the fan so that the grommets protrude through the holes in the chassis; then, use needle-nosed pliers to pull the grommets through the holes from outside the chassis.
3. Connect the fan cable to the system board (see “System-board internal connectors” on page 7 for the location of the rear fan connector).
4. Install any adapters that were removed (see “Installing an adapter” on page 85).
5. Install the side cover (see “Installing the side cover” on page 79).
6. Lock the side cover if it was unlocked during removal.
7. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

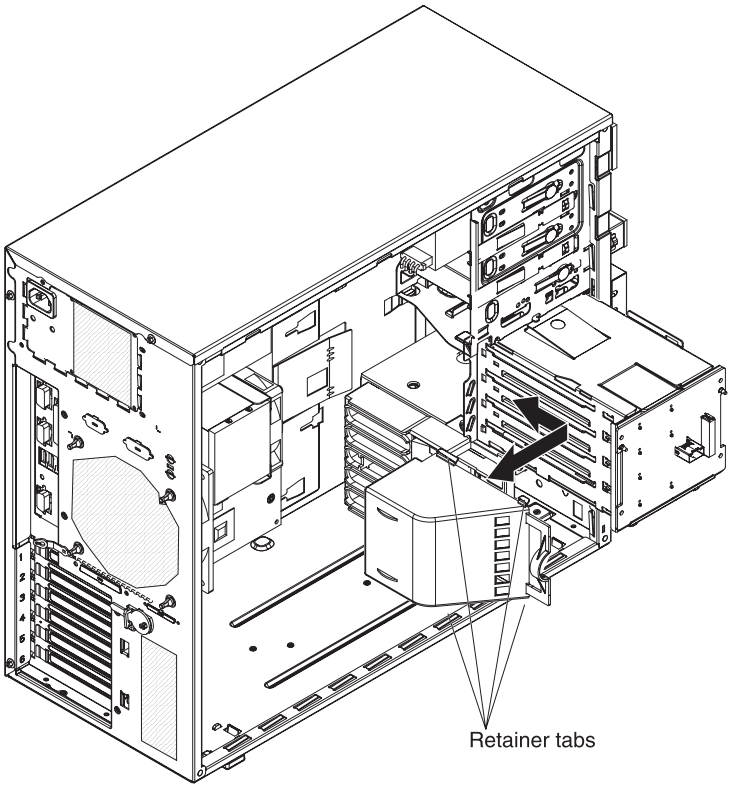
Removing the front system fan assembly

This procedure applies only to server models that have a front system fan assembly.

Attention:

- Replace a failed fan within 48 hours.
- To ensure proper cooling and airflow, do not operate the server for more than 30 minutes with the side cover removed.

To remove the front system fan assembly, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Disconnect the fan assembly cable from the system board, making a note of where the cable was connected for later installation.
5. Press and hold the drive cage release tab; then, rotate the drive cage out of the chassis until the retaining tab on top of the cage locks into place.
6. Slide the fan assembly toward the rear of the drive cage to release the retainer tabs; then, pull the fan assembly away from the drive cage.
7. 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.

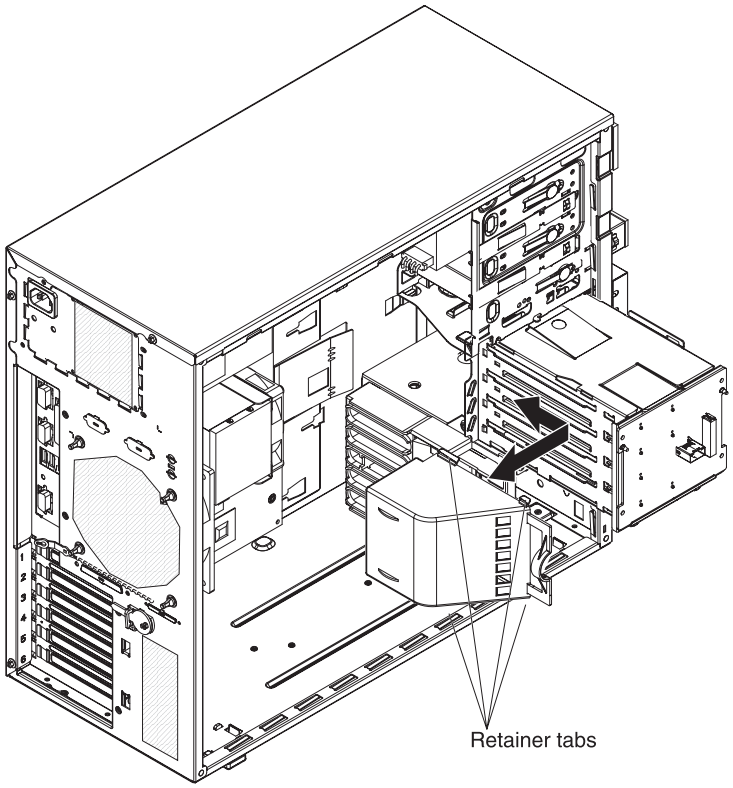
Installing the front system fan assembly

This procedure applies only to server models that have a front system fan assembly.

Attention:

- Replace a failed fan within 48 hours.
- To ensure proper cooling and airflow, do not operate the server for more than 30 minutes with the side cover removed.

To install the front system fan assembly, complete the following steps.

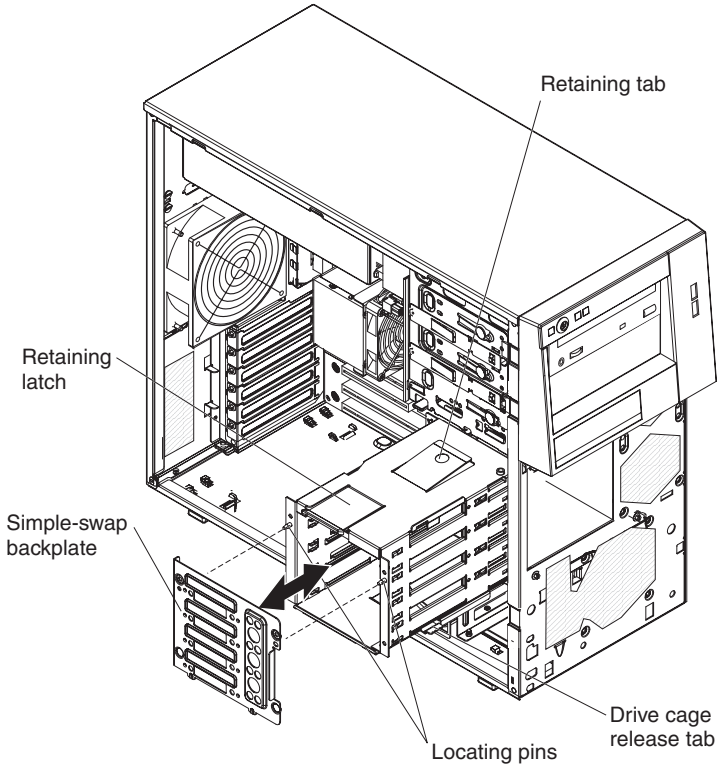


1. Insert the fan assembly retainer tabs into the corresponding slots in the drive cage; then, slide the fan assembly toward the front of the drive cage until the mounting tabs are fully engaged.
2. Press and hold the retaining tab on top of the cage; then, rotate the drive cage into the chassis until it locks into place.
3. Connect the fan assembly cable to the system board (see “System-board internal connectors” on page 7 for the location of the front fan connector).
4. Install the side cover (see “Installing the side cover” on page 79).
5. Lock the side cover if it was unlocked during removal.
6. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the simple-swap backplate

This procedure applies only to server models that have a simple-swap backplate installed on the back of the hard disk drive cage.

To remove the simple-swap backplate, complete the following steps.

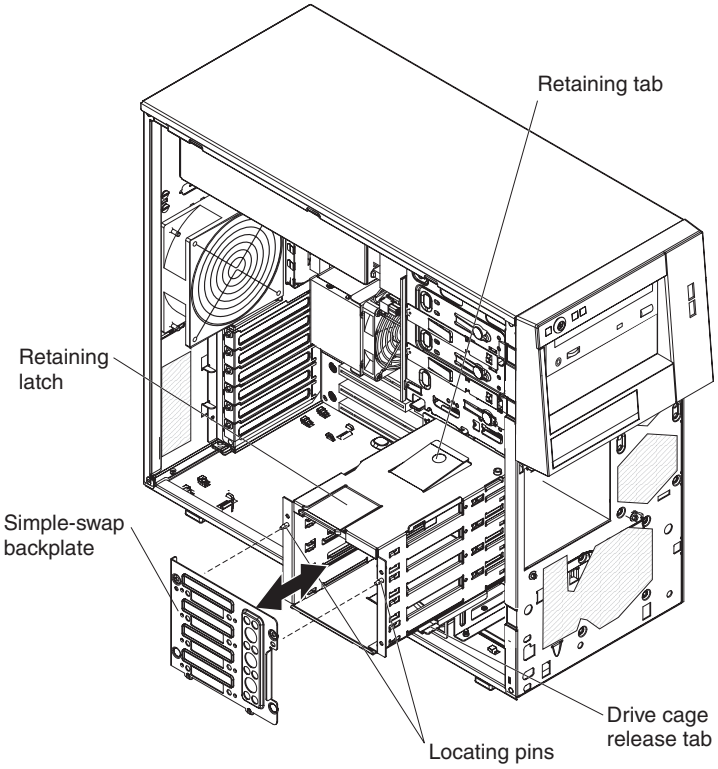


1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Remove the lower bezel (see “Removing the lower bezel” on page 80).
5. Remove the simple-swap hard disk drives that are installed in the hard disk drive cage (see “Removing a simple-swap hard disk drive from bay 4, 5, 6, or 7” on page 94).
6. Disconnect the power cables from the simple-swap backplate.
7. Disconnect the signal cables from the system board.
8. Press and hold the drive cage release tab; then, rotate the drive cage out of the chassis until the retaining tab on top of the cage locks into place.
9. Press up on the retaining latch at the top of the drive cage; then, tilt the top of the simple-swap backplate away from the drive cage until it is clear of the locating pins.
10. Lift the simple-swap backplate out of the lower lip on the drive cage.
11. If you are instructed to return the simple-swap backplate, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the simple-swap backplate

This procedure applies only to server models that have a simple-swap backplate installed on the back of the hard disk drive cage.

To install the simple-swap backplate, complete the following steps.

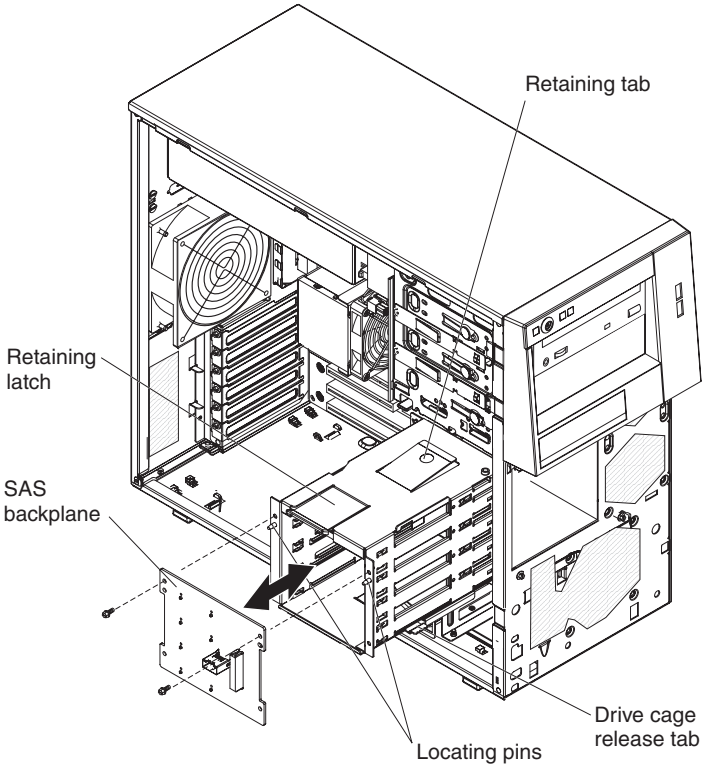


1. Position the bottom edge of the simple-swap backplate in the lower lip of the drive cage.
2. Tilt the top of the simple-swap backplate toward the drive cage and over the locating pins until the retaining latch is engaged.
3. Press and hold the retaining tab on top of the cage; then, rotate the drive cage into the chassis until it locks into place.
4. Connect the signal cables to system board (see “System-board internal connectors” on page 7 for the location of the Serial ATA drive connectors).
5. Connect the power cables to the simple-swap backplate.
6. Install the simple-swap hard disk drives that were removed from the hard disk drive cage (see “Installing a simple-swap hard disk drive in bay 4, 5, 6, or 7” on page 95).
7. Install the lower bezel (see “Installing the lower bezel” on page 81).
8. Install the side cover (see “Installing the side cover” on page 79).
9. Lock the side cover if it was unlocked during removal.
10. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the SAS backplane

This procedure applies only to server models that have a SAS backplane installed on the back of the hard disk drive cage.

To remove the SAS backplane, complete the following steps.

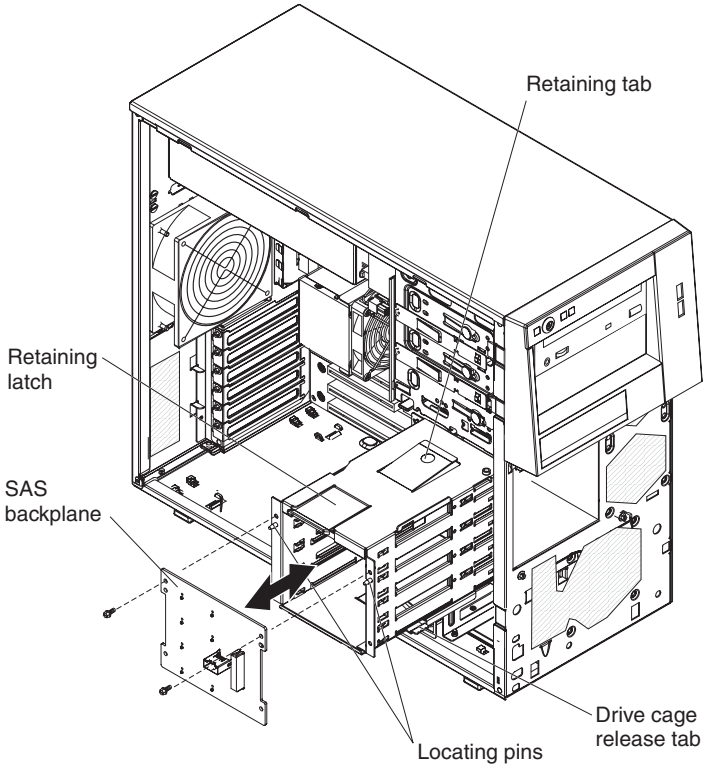


1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Remove the lower bezel (see “Removing the lower bezel” on page 80).
5. Remove the hot-swap hard disk drives installed in the hard disk drive cage (see “Removing a hot-swap hard disk drive from bay 4, 5, 6, or 7” on page 91).
6. Disconnect the power and signal cables from the SAS backplane.
7. Press and hold the drive cage release tab; then, rotate the drive cage out of the chassis until the retaining tab on top of the cage locks into place.
8. Remove the two screws that secure the SAS backplane to the drive cage.
9. Tilt the top of the SAS backplane away from the drive cage until it is clear of the locating pins.
10. Lift the SAS backplane out of the lower lip on the drive cage.
11. If you are instructed to return the SAS backplane, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the SAS backplane

This procedure applies only to server models that have a SAS backplane installed on the back of the hard disk drive cage.

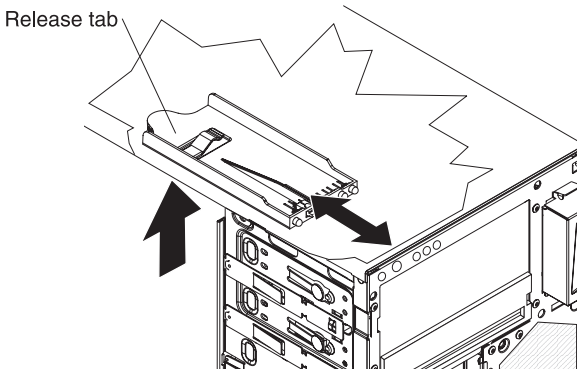
To install the SAS backplane, complete the following steps.



1. Place the bottom edge of the SAS backplane in the lower lip of the drive cage.
2. Tilt the top of the SAS backplane toward the drive cage and over the locating pins.
3. Install the two screws that secure the SAS backplane to the drive cage.
4. Press and hold the retaining tab on top of the cage; then, rotate the drive cage into the chassis until it locks into place.
5. Connect the power and signal cables to the SAS backplane.
6. Install the hot-swap hard disk drives that were removed from the hard disk drive cage (see “Installing a hot-swap hard disk drive in bay 4, 5, 6, or 7” on page 92).
7. Install the lower bezel (see “Installing the lower bezel” on page 81).
8. Install the side cover (see “Installing the side cover” on page 79).
9. Lock the side cover if it was unlocked during removal.
10. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the front-panel assembly

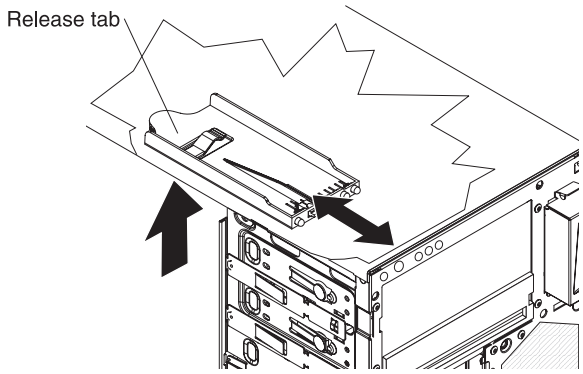
To remove the front-panel assembly, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Remove the lower bezel (see “Removing the lower bezel” on page 80).
5. Remove the upper bezel (see “Removing the upper bezel” on page 82).
6. Slide the drives in bay 1 and bay 2 forward slightly (see “Removing a drive from bay 1, 2, or 3” on page 88 for more information). It is not necessary to remove these drives.
7. If the server has hot-swap power supplies, remove the power supplies and the power-supply cage (see “Removing the power-supply cage” on page 117).
8. Disconnect the front-panel assembly cable from the system board, noting the routing of the cable (see “System-board internal connectors” on page 7 for the location of the front-panel connector).
9. Press up on the release tab of the front-panel assembly and pull the assembly toward the rear of the server; then, remove the front-panel assembly from the chassis.
10. If you are instructed to return the front-panel assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the front-panel assembly

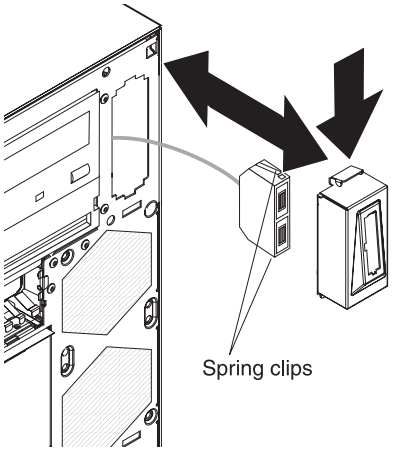
To install the front-panel assembly, complete the following steps.



1. Position the front end of the front-panel assembly in the channel above drive bay 1 on the left side of the chassis.
2. Push the front-panel assembly toward the front of the chassis until it clicks into place.
3. Reroute and connect the front-panel assembly cable to the system board (see “System-board internal connectors” on page 7 for the location of the front-panel connector).
4. If the server has hot-swap power supplies, install the power-supply cage and the power supplies (see “Installing the power-supply cage” on page 118).
5. Push the drives in bay 1 and bay 2 into the drive bays (see “Installing a drive in bay 1, 2, or 3” on page 89 for more information).
6. Install the upper bezel (see “Installing the upper bezel” on page 83).
7. Install the lower bezel (see “Installing the lower bezel” on page 81).
8. Install the side cover (see “Installing the side cover” on page 79).
9. Lock the side cover if it was unlocked during removal.
10. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the front USB connector assembly

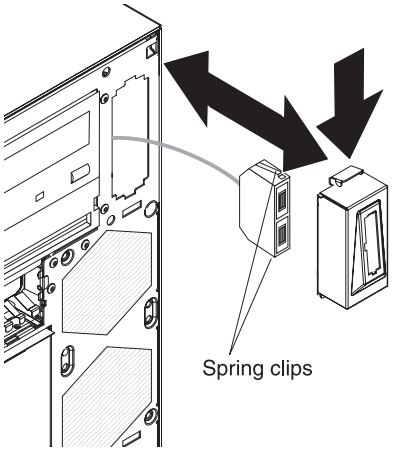
To remove the front USB connector assembly, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Remove the lower bezel (see “Removing the lower bezel” on page 80).
5. Remove the upper bezel (see “Removing the upper bezel” on page 82).
6. Disconnect the front USB cable from the system board, noting the routing of the cable (see “System-board internal connectors” on page 7 for the location of the front USB connector).
7. Press down and hold the release tab on the top of the front USB housing; then, tilt the top of the housing away from the chassis and lift the housing out of the opening in the chassis.
8. Squeeze the spring clips on the sides of the front USB connector assembly and pull the assembly out of the back of the housing.
9. Carefully pull the front USB cable out of the opening in the chassis.
10. If you are instructed to return the front USB connector assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the front USB connector assembly

To install the front USB connector assembly, complete the following steps.

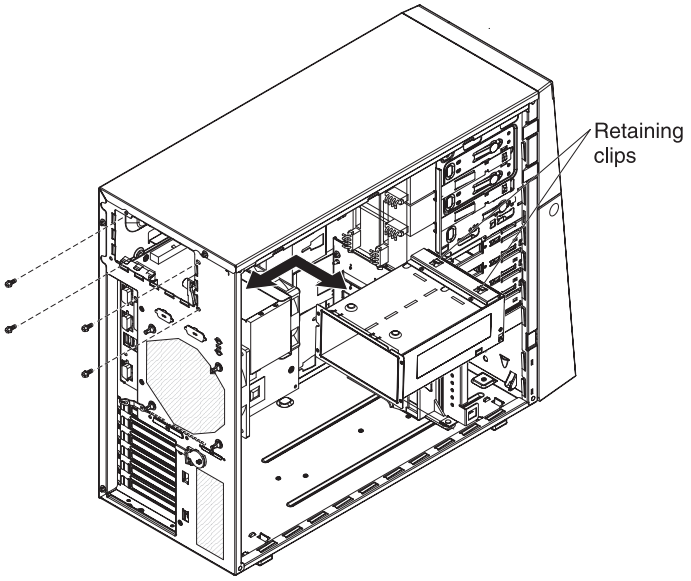


1. Carefully feed the front USB cable through the opening in the front of the chassis.
2. Squeeze the spring clips on the sides of the front USB connector assembly and insert the assembly into the housing through the back of the housing.
3. Place the bottom edge of the housing into the bottom of the opening in the chassis; then, tilt the top of the housing into position until it clicks into place.
4. Reroute and connect the front USB cable to the system board (see “System-board internal connectors” on page 7 for the location of the front USB connector).
5. Install the upper bezel (see “Installing the upper bezel” on page 83).
6. Install the lower bezel (see “Installing the lower bezel” on page 81).
7. Install the side cover (see “Installing the side cover” on page 79).
8. Lock the side cover if it was unlocked during removal.
9. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the power-supply cage

This procedure applies only to server models that have a power-supply cage for hot-swap power supplies.

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



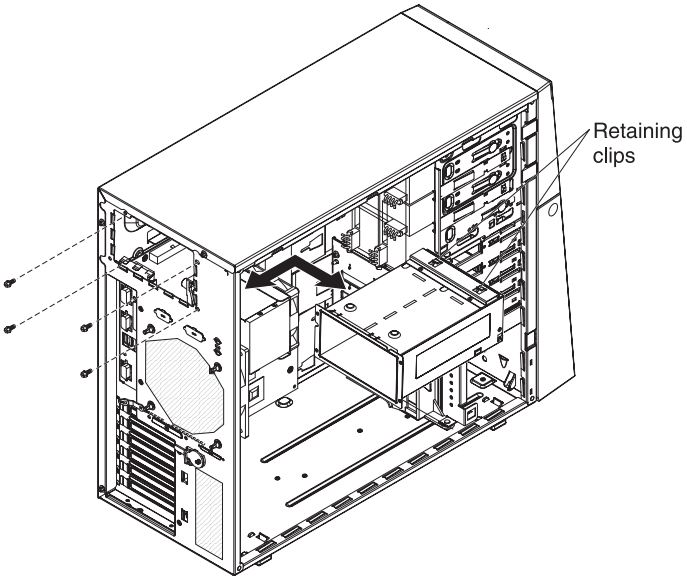
1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Remove both hot-swap power supplies (see “Removing a hot-swap power supply” on page 98).

   Note: It might be helpful to lay the server on its side for the remainder of this procedure.
5. Disconnect the cables from the power-supply cage to the system board and all internal components.
6. Remove the four screws that secure the power-supply cage to the chassis; then, slide the cage toward the front of the server to disengage the retaining clips from the top of the chassis and lift the cage out of the chassis.
7. If you are instructed to return the power-supply cage, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the power-supply cage

This procedure applies only to server models that have a power-supply cage for hot-swap power supplies.

To install the power-supply cage, complete the following steps.

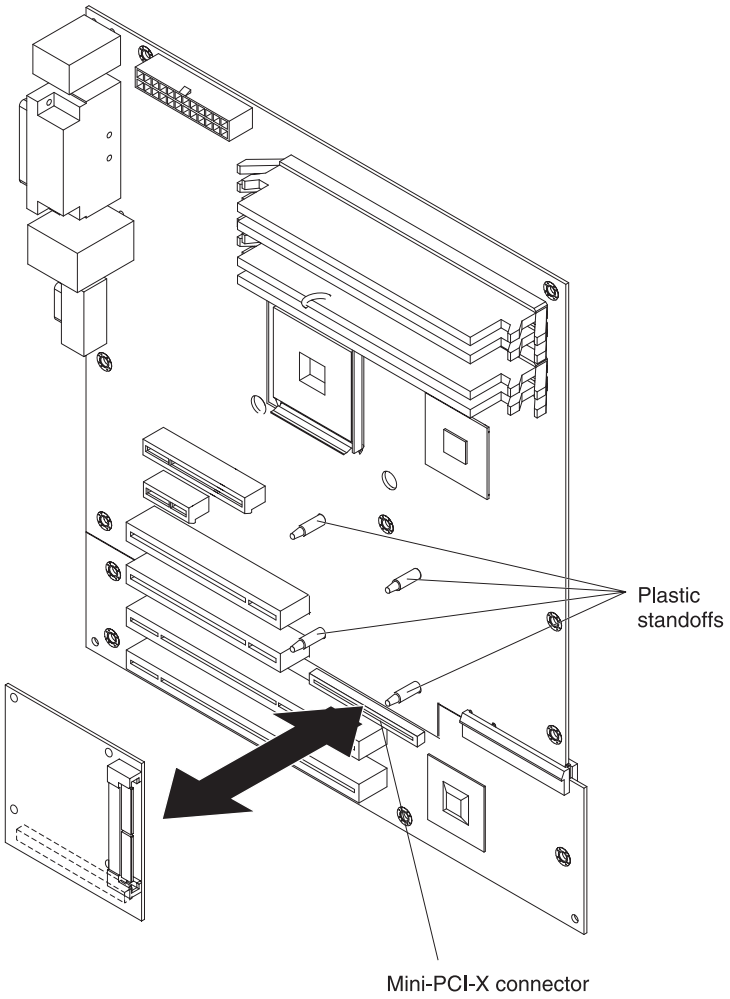


1. Place the power-supply cage into the chassis and slide it toward the rear of the server until the retaining clips engage the top of the chassis.
2. Install the four screws that secure the power-supply cage to the chassis.
3. Connect the cables from the power-supply cage to the system board and all internal components.
4. Reinstall both hot-swap power supplies (see “Installing a hot-swap power supply” on page 100).
5. Install the side cover (see “Installing the side cover” on page 79).
6. Lock the side cover if it was unlocked during removal.
7. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the mini-PCI-X adapter

This procedure applies only to server models that have a SAS mini-PCI-X adapter installed on the PCI-X expansion card.

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

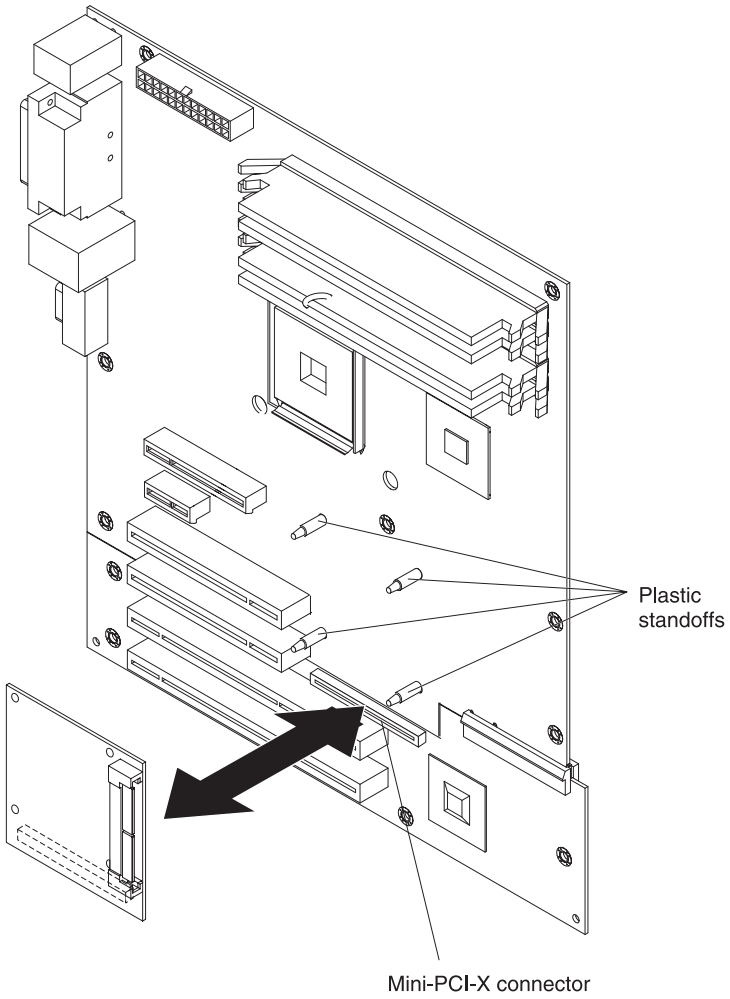


1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).
4. Carefully grasp the mini-PCI-X adapter by the edges and pull it away from the PCI-X expansion card until it disengages from the plastic standoffs and the mini-PCI-X connector. If the standoffs come away from the expansion card with the adapter, gently pull them out of the adapter and push them back into their holes on the PCI-X expansion card.
5. Squeeze the tabs on both sides of the connector on the signal cable and remove the cable from the mini-PCI-X adapter.
6. If you are instructed to return the mini-PCI-X adapter, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the mini-PCI-X adapter

This procedure applies only to server models that have a SAS mini-PCI-X adapter installed on the PCI-X expansion card.

To install the SAS mini-PCI-X adapter, complete the following steps.

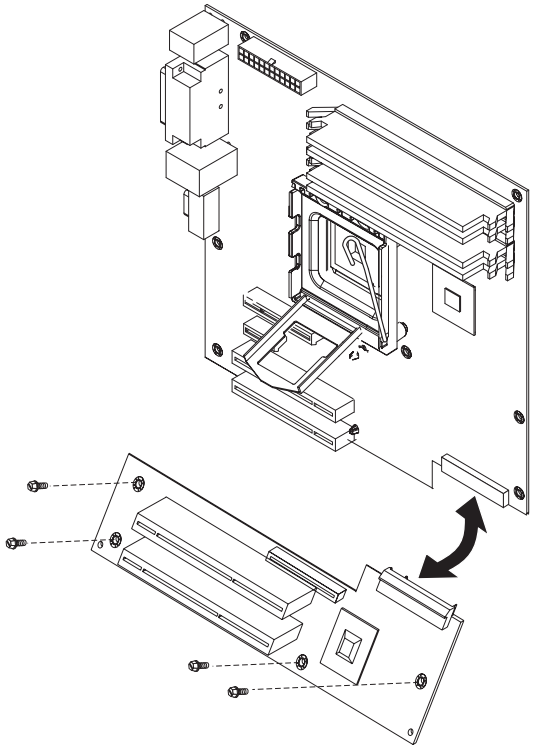


1. Touch the static-protective package that contains the mini-PCI-X adapter to any unpainted surface on the outside of the server; then, remove the mini-PCI-X adapter from the package.
2. Squeeze the tabs on both sides of the connector on the signal cable and connect the cable to the mini-PCI-X adapter.
3. Position the mini-PCI-X adapter over the mini-PCI-X connector and the plastic standoffs; then, press the mini-PCI-X adapter firmly into the PCI-X connector and onto the plastic standoffs.
4. Install the side cover (see “Installing the side cover” on page 79).
5. Lock the side cover if it was unlocked during removal.
6. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the PCI-X expansion card

This procedure applies only to server models that have a PCI-X expansion card attached to the system board.

To remove the PCI-X expansion card, complete the following steps.

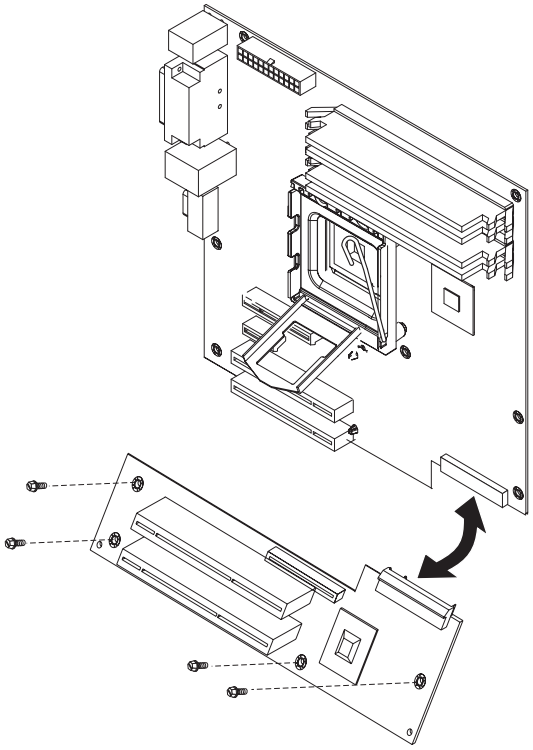


1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Turn the server on its side so that it is lying flat, with the cover facing up.
4. Unlock and remove the side cover (see “Removing the side cover” on page 78).
5. Remove any adapters that are installed on the PCI-X expansion card (see “Removing an adapter” on page 84).
6. Remove the SAS mini-PCI-X adapter, if one is installed (see “Removing the mini-PCI-X adapter” on page 119).
7. Remove any other adapters or cables that impede access to the PCI-X expansion card.
8. Remove the four screws that secure the PCI-X expansion card to the chassis.
9. Carefully tilt the lower edge of the PCI-X expansion card up and pull the expansion card away from the system board connector; then, lift the PCI-X expansion card out of the chassis.
10. If you are instructed to return the PCI-X expansion card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the PCI-X expansion card

This procedure applies only to server models that have a PCI-X expansion card attached to the system board.

To install the PCI-X expansion card, complete the following steps.



1. Insert the PCI-X expansion card into the server at an angle and align the connector on the expansion card with the connector on the system board.
2. While pushing the PCI-X expansion card connector onto the system board connector, lower the expansion card into the chassis, making sure that the screw holes in the expansion card align with the corresponding holes in the chassis.
3. Install the four screws that secure the PCI-X expansion card to the chassis.
4. Install the SAS mini-PCI-X adapter, if one was removed (see “Installing the mini-PCI-X adapter” on page 120).
5. Install any adapters that were removed from the PCI-X expansion card (see “Installing an adapter” on page 85).
6. Reinstall any other adapters or cables that were removed.
7. Install the side cover (see “Installing the side cover” on page 79).
8. Lock the side cover if it was unlocked during removal.
9. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing and replacing FRUs

Field replaceable units (FRUs) must be installed only by trained service technicians.

Removing a non-hot-swap power supply

This procedure applies only to server models that have a non-hot-swap power supply. See “Removing a hot-swap power supply” on page 98 for information about the removal of a hot-swap power supply.

When you remove or install a non-hot-swap power supply, observe the following precautions.

Statement 8:

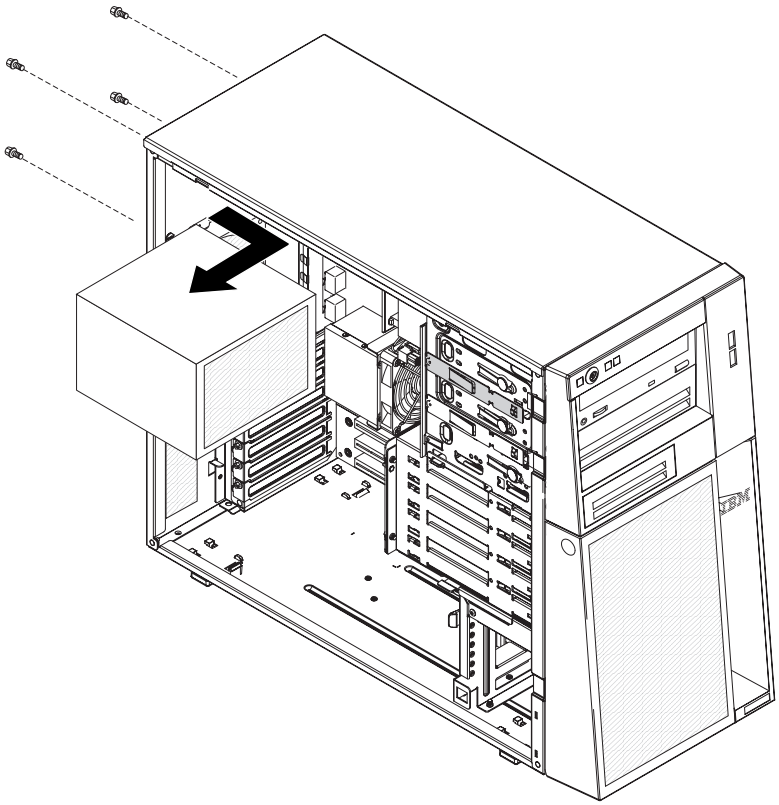


CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.



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

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



1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 78).

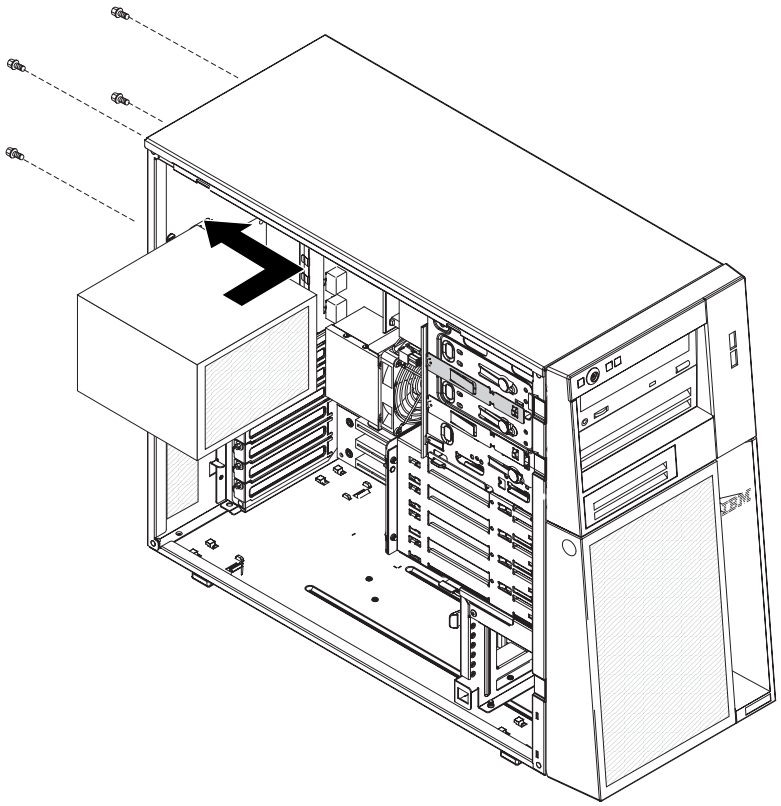
   Note: It might be helpful to lay the server on its side for the remainder of this procedure.
4. Disconnect the cables from the power supply to the system board and all internal components.

   Attention: Support the power supply while removing the mounting screws. After the screws are removed, the power supply is loose and can damage other components in the server.
5. While supporting the power supply, remove the four screws that secure it to the chassis; then, lift the power supply out of the chassis. Save the screws to use when you install the replacement power supply.
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 non-hot-swap power supply

This procedure applies only to server models that have a non-hot-swap power supply. See “Installing a hot-swap power supply” on page 100 for information about the installation of a hot-swap power supply.

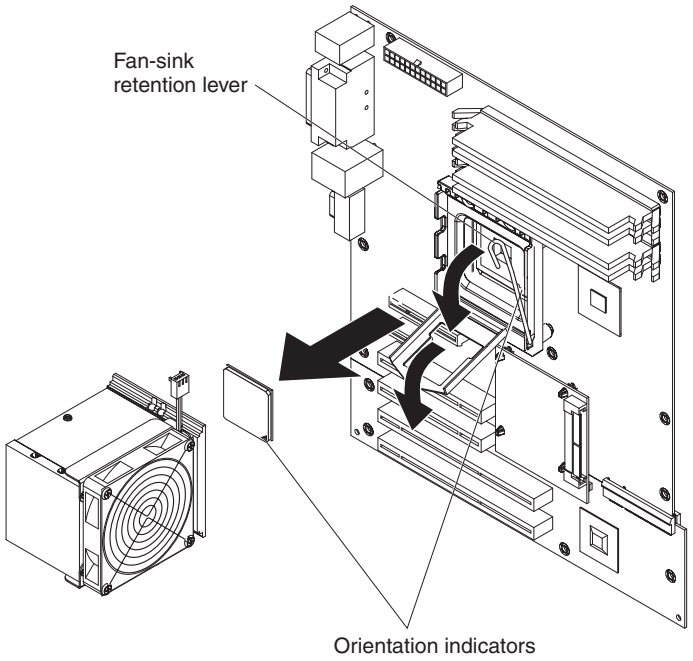
To install a non-hot-swap power supply, complete the following steps.



1. Position the power supply in the chassis so that the screw holes in the power supply are aligned with the corresponding holes in the rear of the chassis.
2. Install the four screws that secure the power supply to the chassis.
3. Connect the cables from the power supply to the system board and all internal components.
4. Install the side cover (see “Installing the side cover” on page 79).
5. Lock the side cover if it was unlocked during removal.
6. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the microprocessor and fan sink

To remove the microprocessor and fansink, complete the following steps.

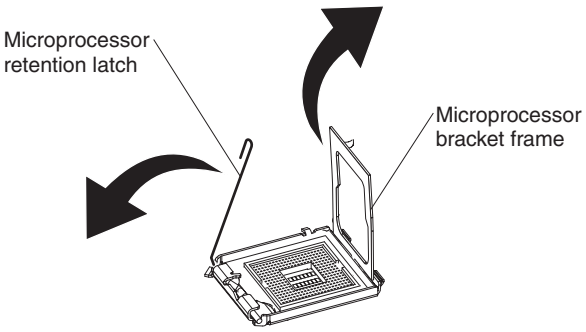


1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Turn the server on its side so that it is lying flat, with the cover facing up.
4. Unlock and remove the side cover (see “Removing the side cover” on page 78).
5. Disconnect any cables that impede access to the fan sink and microprocessor.

   Attention: The fan-sink retention lever is spring-loaded when the fan sink is in place. Releasing the lever too quickly or allowing it to spring upward can damage the fan sink and surrounding components.
6. Remove the fan sink from the microprocessor:
   a. Disconnect the fan-sink cable from the system board.
   b. Release the fan-sink retention lever by pressing down on the end, moving it to the side and slowly releasing it to the open (up) position.

      Important: Be careful when handling the microprocessor and fan sink. If the microprocessor and fan sink will be reused, do not contaminate the thermal material between them.
   c. Tip the top of the fan sink toward the front of the server while sliding it away from the lower flange of the retention module; then, remove it from the server. After removal, place the fan sink on its side on a clean, flat surface.

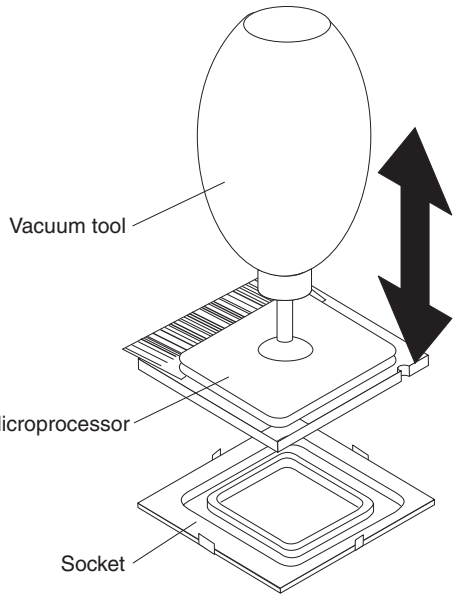
   Attention: The microprocessor retention latch is spring-loaded when the microprocessor is in place. Releasing the latch too quickly or allowing it to spring upward can damage the microprocessor and surrounding components.
7. Release the microprocessor retention latch by pressing down on the end, moving it to the side, and slowly releasing it to the open (up) position.



8. Open the microprocessor bracket frame by lifting up the tab on the top edge.

   Attention: Use the vacuum tool that comes with the replacement part to remove the microprocessor. Dropping the microprocessor during removal can damage the contacts. Also, contaminants on the microprocessor contacts, such as oil from your skin, can cause connection failures between the contacts and the socket.

9. Remove the microprocessor by using the vacuum tool and completing the following steps.

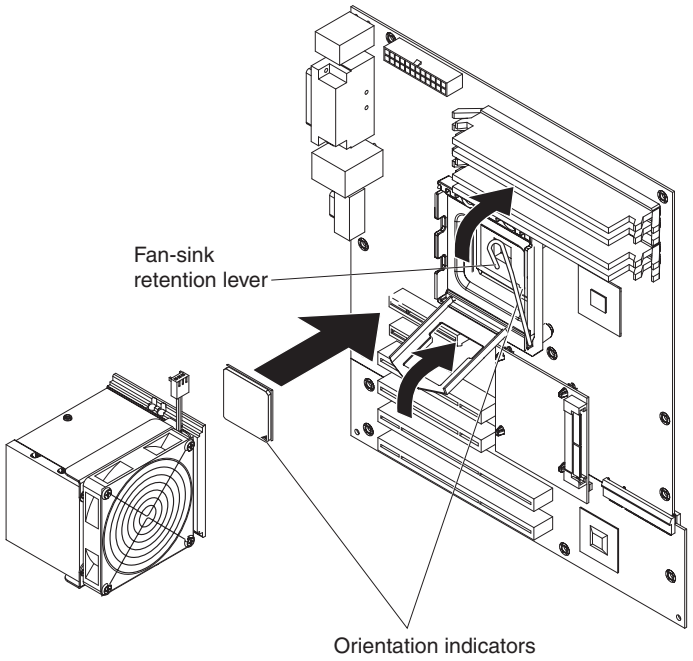


   a. Squeeze and hold the bladder of the tool; then, place the suction cup on the microprocessor and release the bladder.
   b. Using the tool, carefully lift the microprocessor straight up and out of the socket, and place it on a static-protective surface.
   c. Squeeze the bladder of the tool to release the microprocessor from the suction cup.

10. If you are instructed to return the microprocessor and fan sink, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a microprocessor and fan sink

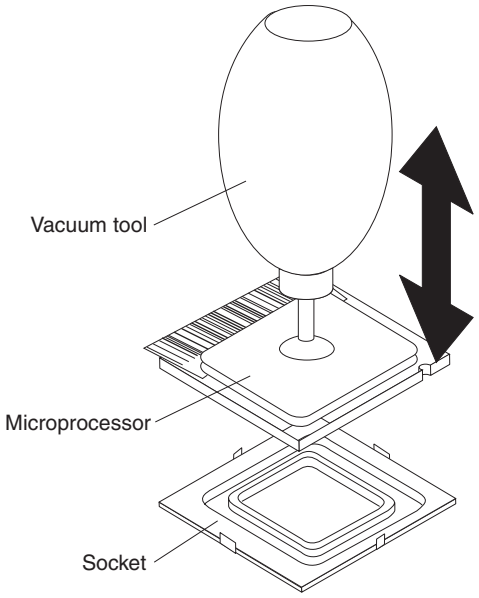
To install the microprocessor and fan sink, complete the following steps.



1. Make sure that the microprocessor socket lever and cover are in the fully open position.

   Attention: Use the vacuum tool that comes with the replacement part to install the microprocessor. Dropping the microprocessor during installation can damage the contacts. Also, contaminants on the microprocessor contacts, such as oil from your skin, can cause connection failures between the contacts and the socket.

2. Install the microprocessor by using the vacuum tool and completing the following steps.



   a. Squeeze and hold the bladder of the tool; then, place the suction cup on the microprocessor and release the bladder.

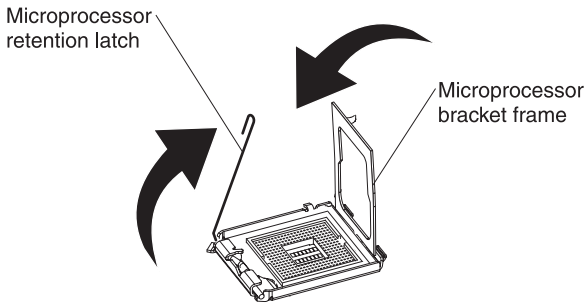
Note: To maintain proper orientation between the microprocessor and the microprocessor socket during installation, observe the following information:

- The microprocessor has two notches that are keyed to two tabs on the sides of the socket.
- A triangle-shaped indicator on one corner of the microprocessor points to a 45-degree angle on one corner of the socket.

b. Using the tool, carefully place the microprocessor into the socket.

c. Squeeze the bladder of the tool to release the microprocessor from the suction cup.

3. Close the microprocessor bracket frame; then, close the microprocessor retention latch and lock it securely in place.



4. Install the fan sink:

a. Make sure that the fan-sink retention lever is in the fully open position.

Important: Be careful when handling the microprocessor and fan sink. Do not contaminate the thermal material between them.

b. Slide the bottom edge of the fan sink under the lower flange of the retention module; then, place the top of the fan sink onto the top of the retention module.

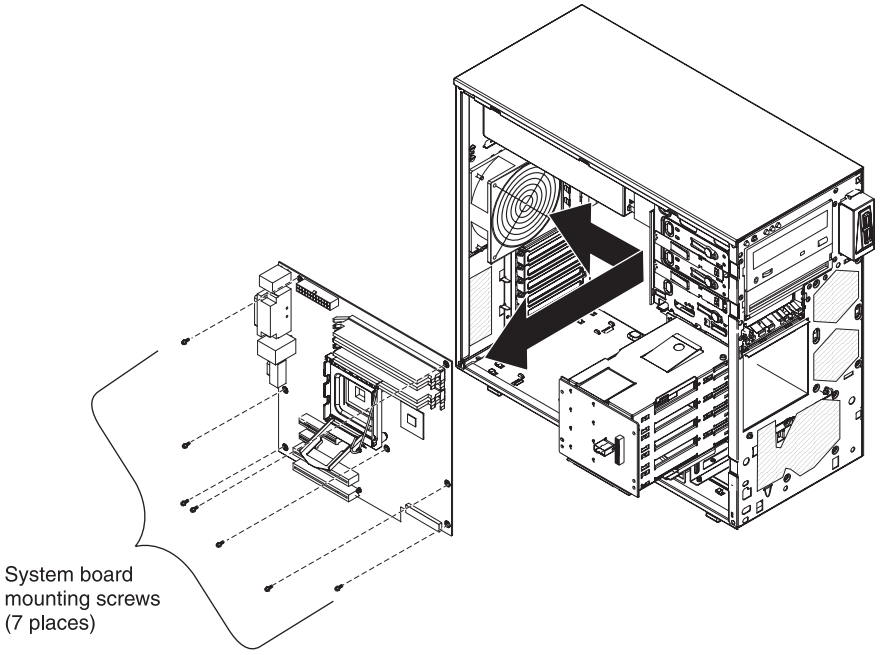
c. Close the fan-sink retention lever and lock it securely in place.

d. Reconnect the fan-sink cable to the system board (see “System-board internal connectors” on page 7 for the location of the fan-sink connector).

5. Reconnect any cables that were disconnected during the removal of the old microprocessor.
6. Install the side cover (see “Installing the side cover” on page 79).
7. Lock the side cover if it was unlocked during removal.
8. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the system board

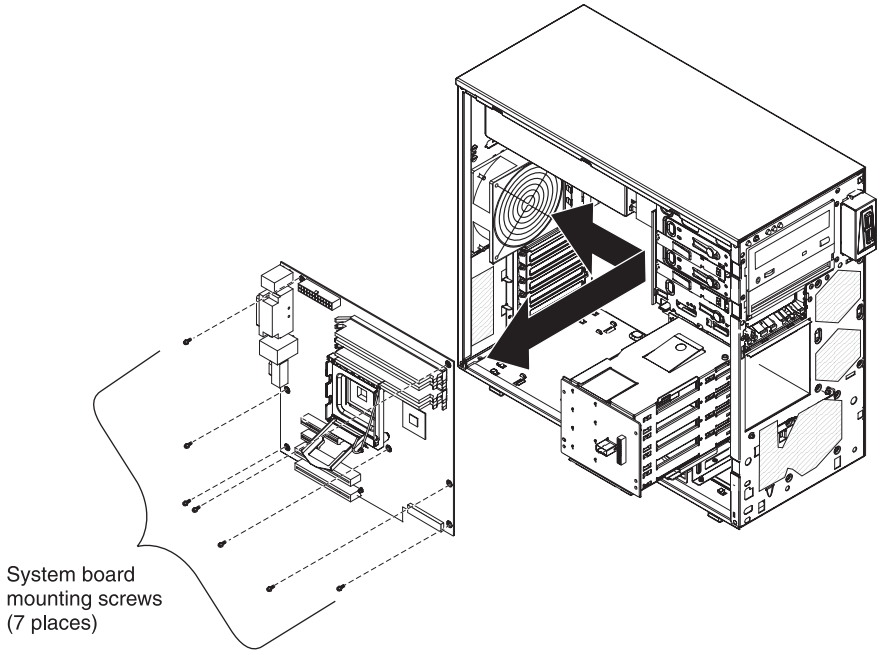
To remove the system board, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 75.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Turn the server on its side so that it is lying flat, with the cover facing up.
4. Unlock and remove the side cover (see “Removing the side cover” on page 78).
5. Note where each cable is connected; then, disconnect all cables from the system board.
6. Press and hold the drive cage release tab; then, rotate the drive cage out of the chassis until the retaining tab on top of the cage locks into place.
7. Remove any of the following components that are installed on the system board and put them in a safe, static-protective place:
   - Adapters (see “Removing an adapter” on page 84).
   - SAS mini-PCI-X adapter (see “Removing the mini-PCI-X adapter” on page 119).
   - Microprocessor and fan sink (see “Removing the microprocessor and fan sink” on page 126).
   - DIMMs (see “Removing a memory module” on page 101).
   - Battery (see “Removing the battery” on page 103).
   - PCI-X expansion card (see “Removing the PCI-X expansion card” on page 121).
8. Remove the seven screws that secure the system board to the chassis.
9. Slide the system board toward the front of the server to disengage the tabs in the chassis; then, carefully lift the system board out of the server.
10. 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

To install the system board, complete the following steps.



1. Insert the system board into the chassis and slide it toward the rear of the server until it fully engages the tabs in the chassis.

   Note: The tabs are fully engaged when the screw holes in the system board are aligned with the corresponding holes in the chassis.
2. Install the seven screws that secure the system board to the chassis.
3. Install any of the following components that were removed from the system board:
   - PCI-X expansion card (see “Installing the PCI-X expansion card” on page 122).
   - Battery (see “Installing the battery” on page 103).
   - DIMMs (see “Installing a memory module” on page 102).
   - Microprocessor and fan sink (see “Installing a microprocessor and fan sink” on page 128).
   - SAS mini-PCI-X adapter (see “Installing the mini-PCI-X adapter” on page 120).
   - Adapters (see “Installing an adapter” on page 85)
4. Press and hold the retaining tab on top of the cage; then, rotate the drive cage into the chassis until it locks into place.
5. Reconnect any cables to the system board that were disconnected during removal.
6. Install the side cover (see “Installing the side cover” on page 79).
7. Lock the side cover if it was unlocked during removal.
8. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Chapter 5. 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/support/ to check for the latest level of firmware, such as BIOS code, vital product data (VPD) 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.

The following items are downloadable from the Web at http://www.ibm.com/support/:

- BIOS code
- Diagnostics programs
- Mini-BMC firmware
- Ethernet firmware
- ServeRAID firmware
- SAS firmware

Major components contain VPD code. You can select to update the VPD code during the BIOS code update procedure.

Configuring the server

The *ServerGuide Setup and Installation* CD provides software setup tools and installation tools that are specifically designed for the server. Use this CD during the initial installation of the server to configure basic hardware features and to simplify the operating-system installation. (See “Using the ServerGuide Setup and Installation CD” on page 134 for more information.)

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

- Configuration/Setup Utility program
- SAS/SATA Configuration Utility program (hot-swap SAS/SATA models only)

  Use the SAS/SATA Configuration Utility program to configure devices that are attached to the SAS/SATA controller (hot-swap SAS/SATA models only). For information about using this program, see “Using the SAS/SATA Configuration Utility program (hot-swap SAS/SATA models only)” on page 135.
- Adaptec® HostRAID™ configuration programs
  - Adaptec RAID Configuration Utility programs (for Serial ATA RAID)
  - SAS/SATA Configuration Utility program

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- ServeRAID Manager
- Boot Menu program
- Broadcom Gigabit Ethernet Utility program

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

Using the ServerGuide Setup and Installation CD

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

To start the *ServerGuide Setup and Installation* CD, complete the following steps:

1. Insert the CD, and restart the server. If the CD does not start, see “ServerGuide problems” on page 42
2. Follow the instructions that appear on the screen to:
   a. Select your language.
   b. Select your keyboard layout and country.
   c. View the overview to learn about ServerGuide features.
   d. View the readme file to review installation tips about the operating system and adapter.
   e. Start the setup and hardware configuration programs.
   f. Start the operating system installation. You will need your copy of the operating-system CD.

Using the Configuration/Setup Utility program

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

- Change interrupt request (IRQ) settings
- Change the startup drive sequence
- Configure serial-port assignments
- Enable USB keyboard and mouse support
- Resolve configuration conflicts
- Set the date and time
- Set passwords and security settings

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

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

See the *User’s Guide* on the IBM *xSeries Documentation* CD for more detailed information about the Configuration/Setup Utility program.

Using the SAS/SATA Configuration Utility program (hot-swap SAS/SATA models only)

Important: RAID options and HostRAID are not supported on the SCO 6.0 and UnixWare 7.14 operating systems.

Use the SAS/SATA Configuration Utility program to configure SAS devices. The SAS/SATA Configuration Utility program is available on hot-swap SATA or SAS models only.

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

1. Turn on the server.
2. When the prompt `<<< Press <CTRL><A> for SAS/SATA Configuration Utility! >>>` appears, press Ctrl+A. If you have set an administrator password, you are prompted to type the password.

   Note: If the prompt `<<< Press <CTRL><A> for SAS/SATA Configuration Utility! >>>` does not appear, start the Configuration/Setup Utility (see the *User's Guide* on the IBM *xSeries Documentation* CD), select **Devices and I/O Ports --> Advanced Chipset Control --> Serial ATA** and make sure that the Serial ATA options are set to the following values:

Native Mode Operation:	**Auto**
SATA Controller Mode Option:	**Enhanced**
SATA RAID:	**Enabled**

3. To select a choice from the menu, use the arrow keys.
4. Use the arrow keys to select the channel for which you want to change settings.
5. To change the settings of the selected items, follow the instructions on the screen. Be sure to press Enter to save your changes.

Using the Adaptec HostRAID configuration programs

Important: RAID options and HostRAID are not supported on the SCO 6.0 and UnixWare 7.14 operating systems.

Use the Adaptec RAID Configuration Utility programs and SAS/SATA Configuration Utility (also referred to as IBM ServeRAID-7e) to add RAID level-0 and level-1 functionality to the integrated Serial ATA controller (simple-swap SATA models) and the SAS/SATA controller (hot-swap models). Be sure to use these programs as described in this document. Use these programs to perform the following tasks:

- Configure a redundant array of independent disks (RAID) array
- View or change the RAID configuration and associated devices

When you are using the Adaptec RAID Configuration Utility programs and SAS/SATA Configuration Utility program to configure and manage arrays, consider the following information:

- The SAS/SATA controller with integrated RAID (hot-swap models) and the integrated Serial ATA controller (simple-swap SATA models) with integrated SATA RAID support RAID level-0 and level-1 with the option of having a hot-spare drive. An optional ServeRAID controller provides additional RAID levels.

- You cannot use the *ServerGuide Setup and Installation* CD to configure the integrated Serial ATA controller with integrated RAID and the SAS/SATA controller with integrated RAID.
- Hard disk drive capacities affect how you create arrays. 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.
- To help ensure signal quality, do not mix drives with different speeds and data rates.
- To update the firmware and BIOS code for an optional ServeRAID controller, you must use the IBM *ServeRAID Support* CD that comes with the ServeRAID option.
- If you install a different type of RAID controller in the server, use the method that is described in the instructions that come with the controller to view or change settings for attached devices.

Using the Adaptec RAID Configuration Utility programs (for Serial ATA RAID)

Use the Array Configuration Utility, in the Adaptec RAID Configuration Utility programs, to add RAID level-0 and level-1 functionality to the integrated Serial ATA (SATA) controller. This utility is a part of the BIOS code. For additional information about using the Adaptec RAID Configuration Utility programs, see the documentation on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD. If this CD did not come with the server, you can download it from http://www.ibm.com/support/.

The integrated Serial ATA RAID feature (SATA HostRAID) comes disabled by default. You must enable it and install the device drivers before you can use it. The SATA RAID feature configuration utilities, device drivers, and information are available on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD.

Enabling the Serial ATA HostRAID feature: Complete the following steps to enable the SATA RAID feature:

1. Turn on the server.
2. When the prompt `Press F1 for Configuration/Setup` appears, press F1. If you have set an administrator password, you are prompted to type the password.
3. Select **Devices and I/O Ports --> Advanced Chipset Control --> Serial ATA**.
4. Select **SATA Controller Mode Option**. Change the value to **Enhanced**.
5. Scroll down and select **SATA RAID Enable**.
6. Select **Enabled**.
7. Press Esc; then, select **Yes** to save your changes.

Using the Serial ATA HostRAID feature: The instructions in this section are for using the Array Configuration Utility program to access and perform an initial RAID level-1 configuration. If you install a different type of RAID adapter, use the method that is described in the instructions that come with the adapter to view or change settings for the attached devices.

For additional information about using the Array Configuration Utility program to create, configure, and manage arrays, see the documentation on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD.

Configuring the controller: To use the Array Configuration Utility program to configure a RAID level-1 array, complete the following steps:

1. Turn on the server.
2. When the prompt `Press <CTRL><<A> for Adaptec RAID Configuration Utility` appears, press Ctrl+A.
3. Select **Array Configuration Utility**.
4. Select **Create Array**.
5. From the list of ready drives, select the two drives that you want to group into the array.
6. When you are prompted to select the RAID level, select **RAID-1**.
7. (Optional) Type an identifier for the array.
8. When you are prompted for the array build method, select **Quick Int**.
9. Follow the instructions on the screen to complete the configuration, and select **Done** to exit.
10. Restart the server.

Viewing the configuration: Complete the following steps to view information about the Serial ATA controller:

1. Start the Array Configuration Utility.
2. From the Array Configuration Utility window, select **Manage Arrays**.
3. Select an array and press Enter.
4. Press Esc to exit from the program.

Using the SAS/SATA Utility program (for SAS/SATA HostRAID)

Use the SAS/SATA Configuration Utility to add RAID level-0 and level-1 functionality to the SAS/SATA controller (hot-swap models only). This utility is part of the BIOS code.

Note: To add RAID functionality to the integrated SATA controller (simple-swap models), see “Using the Adaptec RAID Configuration Utility programs (for Serial ATA RAID)” on page 136.

The integrated SAS/SATA RAID feature comes disabled by default. You must enable it and install the device drivers before you can use it. The RAID configuration utilities, device drivers, and information are available on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD. If this CD did not come with the server, you can download it from http://www.ibm.com/support/.

Enabling the SAS/SATA HostRAID feature: To enable the SAS/SATA HostRAID feature, complete the following steps:

1. Turn on the server.
2. When the prompt `Press <CTRL><A> for SAS/SATA Configuration Utility` appears, press Ctrl+A. If you have set an administrator password, you are prompted to type the password.
3. Select **SerialSelect Utility**; then, select **Controller Configuration**.
4. Select **RAID Support**.
5. Select **Enabled**.
6. Press Esc; then, select **Yes** to save the changes.

Using the SAS/SATA HostRAID feature: The instructions in this section describe how to access the SAS/SATA HostRAID feature (hot-swap models only) from the SAS/SATA Configuration Utility program and perform an initial RAID level-1 configuration. If you install a different type of RAID adapter in the server, use the method that is described in the instructions that come with the adapter to view or change settings for attached devices.

For additional information about how to use the HostRAID feature, see the documentation on the IBM *ServeRAID-7e (Adaptec HostRAID) Support* CD.

Configuring the controller: To use the SAS/SATA HostRAID feature to configure a RAID level-1 array, complete the following steps:

1. Turn on the server.
2. When the message `Press <CTRL><A> for SAS/SATA Configuration Utility` appears, press Ctrl+A.
3. Select **Array Configuration Utility**.
4. Select **Create Array**.
5. From the list of ready drives, select the two drives that you want to group into the array.
6. When you are prompted to select the RAID type, select **RAID-1**.
7. (Optional) Type an identifier for the array.
8. When you are prompted for the array build method, select **Quick Int**.
9. Follow the instructions on the screen to complete the configuration; then, select **Done** to exit.
10. Restart the server.

Viewing the configuration: To view information about the SAS/SATA controller, complete the following steps:

1. Start the SAS/SATA Configuration Utility program.
2. From the SAS/SATA Configuration Utility window, select **Manage Arrays**.
3. Select an array and press Enter.
4. To exit from the program, press Esc.

Using ServeRAID Manager

Important: RAID options and HostRAID are not supported on the SCO 6.0 and UnixWare 7.14 operating systems.

Use ServeRAID Manager, which is on the IBM *ServeRAID Support* CD, to perform the following tasks:

- Configure a redundant array of independent disks (RAID) array
- Erase all data from a hot-swap SAS hard disk drive and return the disk to the factory-default settings
- View the RAID configuration and associated devices
- Monitor the operation of the RAID controllers

To perform some tasks, you can run ServeRAID Manager as an installed program. However, to configure the SAS/SATA controller and perform an initial RAID configuration on the server, you must run ServeRAID Manager in Startable CD mode, as described in the instructions in this section. If you install a different type of RAID adapter in the server, use the method that is described in the instructions that come with the adapter to view or change settings for attached devices.

For additional information about RAID technology and instructions for using ServeRAID Manager, see the ServeRAID documentation on the IBM *ServeRAID Support* CD. Additional information about ServeRAID Manager is also available from the **Help** menu. For information about a specific object in the ServeRAID Manager tree, select the object and click **Actions → Hints and tips.**

Configuring the controller

By running ServeRAID Manager in Startable CD mode, you can configure the controller before you install the operating system. The information in this section assumes that you are running ServeRAID Manager in Startable CD mode.

To run ServeRAID Manager in Startable CD mode, turn on the server; then, insert the IBM *ServeRAID Support* CD into the CD drive. If ServeRAID Manager detects an unconfigured controller and ready drives, the Configuration wizard starts.

In the Configuration wizard, you can select express configuration or custom configuration. Express configuration automatically configures the controller by grouping the first two physical drives in the ServeRAID Manager tree into an array and creating a RAID level-1 logical drive. If you select custom configuration, you can select the two physical drives that you want to group into an array and create a hot-spare drive.

Using express configuration: To use express configuration, complete the following steps:

1. In the ServeRAID Manager tree, click the controller.
2. From the toolbar, click **Create**.
3. Click **Express configuration**.
4. Click **Next**.
5. In the “Configuration summary” window, review the information. To change the configuration, click **Modify arrays** or **Modify logical drives**.

   Note: Some operating systems have size limitations for logical drives. Before you save the configuration, make sure that the size of the logical drive is appropriate for your operating system.
6. Click **Apply**; when you are asked whether you want to apply the new configuration, click **Yes**. The configuration is saved in the controller and in the physical drives.
7. Exit from ServeRAID Manager and remove the CD from the CD drive.
8. Restart the server.

Using custom configuration: To use custom configuration, complete the following steps:

1. In the ServeRAID Manager tree, click the controller.
2. From the toolbar, click **Create**.
3. Click **Custom configuration**.
4. Click **Next**.
5. Click the applicable tab in the right pane. In the “Create arrays” window, from the list of ready drives, select the two drives that you want to move into the array.
6. Click the icon to add the drives to the array.
7. If you want to configure a hot-spare drive, complete the following steps:
   a. Click the **Spares** tab.
   b. Select the physical drive that you want to designate as the hot-spare drive, and click the icon to add the drive.
8. Click **Next**.
9. In the “Configuration summary” window, review the information. To change the configuration, click **Back**.
10. Click **Apply**; when you are asked whether you want to apply the new configuration, click **Yes**. The configuration is saved in the controller and in the physical drives.
11. Exit from ServeRAID Manager, and remove the CD from the CD drive.
12. Restart the server.

Viewing the configuration

You can use ServeRAID Manager to view information about RAID controllers and the RAID subsystem (such as arrays, logical drives, hot-spare drives, and physical drives). When you click an object in the ServeRAID Manager tree, information about that object appears in the right pane. To display a list of available actions for an object, click the object and click **Actions**.

Using the Boot Menu program

The Boot Menu program is a built-in, menu-driven configuration 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 the startup device.

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

Configuring the Ethernet controller

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

You do not have to set any jumpers or configure the controller. However, you must install a device driver to enable the operating system to address the controller. 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/support/.
2. Under **Search technical support**, type `8485` or `8490` (depending on the machine type for your server model), and click **Search**.
3. In the **Additional search terms** field, type `ethernet`, and click **Go**.

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your @server or IntelliStation® system or optional device, 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/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 @server and IntelliStation systems also describes the diagnostic tests that you can perform. Most @server and IntelliStation 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 @server or IntelliStation 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/support/ and follow the instructions. Also, some documents are available through the IBM Publications Ordering System at http://www.elink.ibmlink.ibm.com/public/applications/publications/cgibin/pbi.cgi.

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Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM @server and IntelliStation systems, optional devices, services, and support. The address for IBM xSeries and BladeCenter® information is http://www.ibm.com/eserver/xseries/. The address for IBM IntelliStation information is http://www.ibm.com/pc/us/intellistation/.

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

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, 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.

Appendix B. Notices

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Chipkill	ThinkPad
EtherJet	Tivoli
e-business logo	Tivoli Enterprise
@server	Update Connector
FlashCopy	Wake on LAN
IBM	XA-32
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IntelliStation	X-Architecture
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Netfinity	XpandOnDemand
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Important notes

Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD-ROM drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Maximum memory may require replacement of the standard memory with an optional memory module.

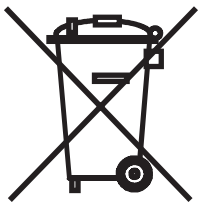
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Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

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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.

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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.

Battery return program

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

In the United States, IBM has established a 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.

In the Netherlands, the following applies.



For Taiwan: Please recycle batteries.



Electronic emission notices (Class A)

IBM @server xSeries 206m Types 8485 and 8490

Important: The notices in this section apply to xSeries 206m servers that have hot-swap power supplies.

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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Industry Canada Class A emission compliance statement

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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.

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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.

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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

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干扰采取切实可行的措施。

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Electronic emission notices (Class B)

IBM @server xSeries 206m Types 8485 and 8490

Important: The notices in this section apply to xSeries 206m servers that have non-hot-swap power supplies.

Federal Communications Commission (FCC) statement

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

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

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

Responsible party:

International Business Machines Corporation
New Orchard Road
Armonk, NY 10504
Telephone: 1-919-543-2193

Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Industry Canada Class B emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards. This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

Japanese Voluntary Control Council for Interference (VCCI) statement

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