

xSeries 100 Type 8486

Installation Guide

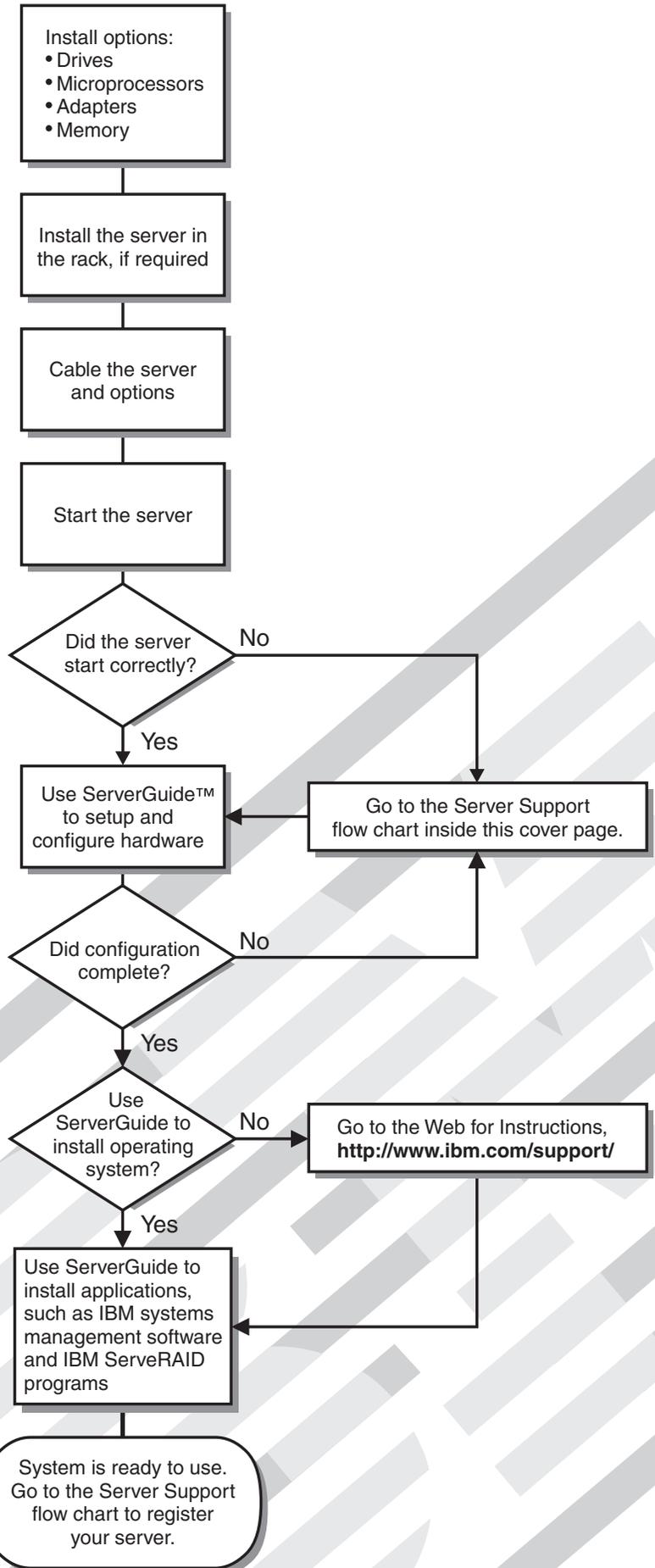
Welcome...

Thank you for buying an IBM xSeries server.

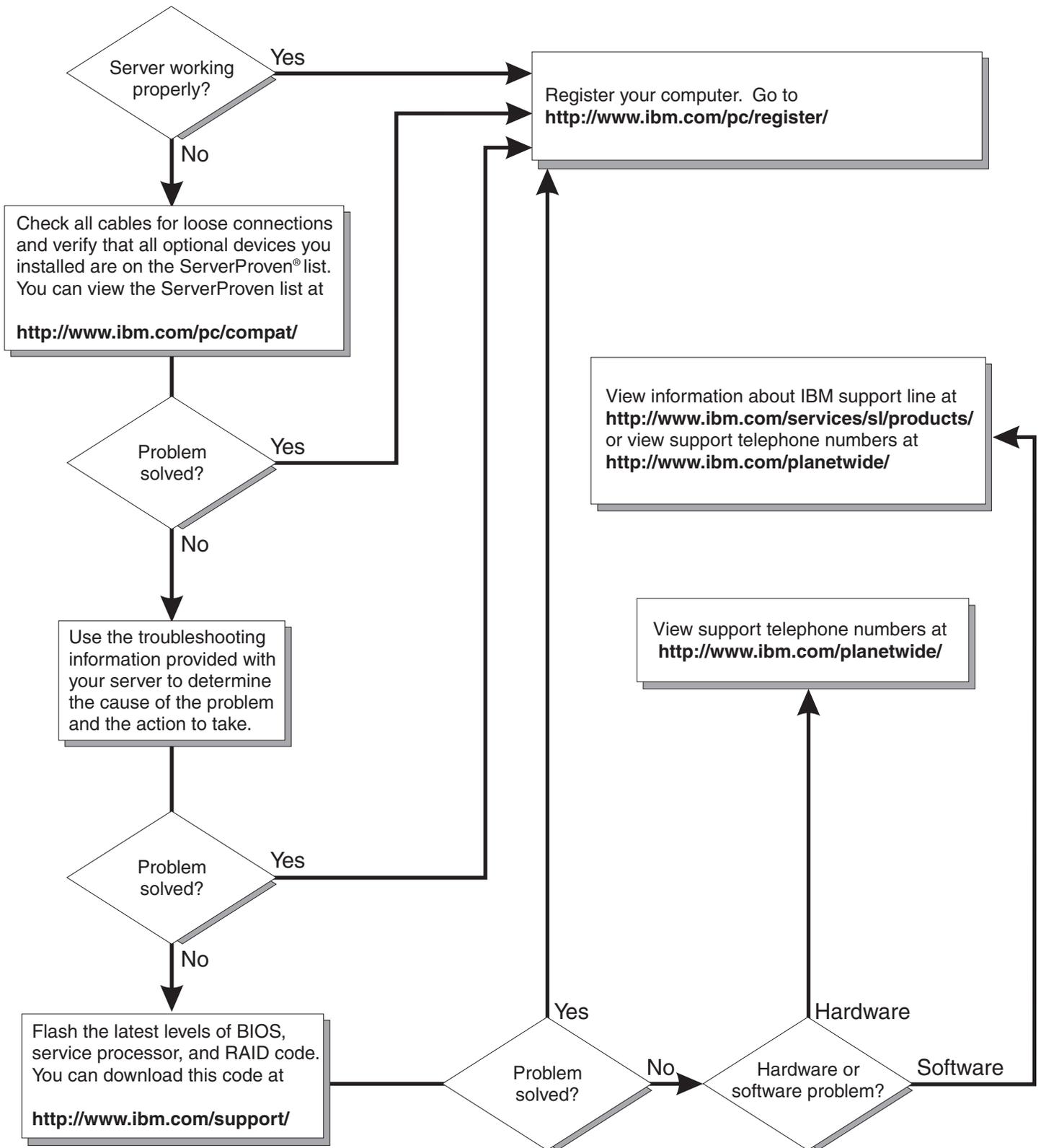
This server *Installation Guide* contains information for setting up and configuring your server.

For detailed information about your server, view the *User's Guide* on the Documentation CD.

You can also find the most current information about your server on the IBM Web site at: <http://www.ibm.com/support>



Server Support





@server

xSeries 100

Type 8486

Installation Guide

Note:

Before using this information and the product it supports, read the general information in Appendix B, "Notices," on page 61 and the *Warranty and Support Information* document on the IBM *IntelliStation Documentation CD*.

First Edition (October 2005)

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

在安装本产品之前，请仔细阅读 **Safety Information** (安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

Statement 1:



DANGER

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

To avoid a shock hazard:

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

To Connect:

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

To Disconnect:

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

Statement 2:



CAUTION:

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

Do not:

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

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

Statement 3:



CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

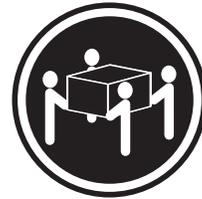
Statement 4:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

CAUTION:

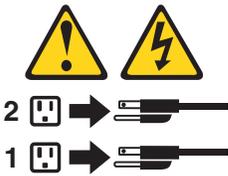
Use safe practices when lifting.

Statement 5:



CAUTION:

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



Statement 8:



CAUTION:

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



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

Statement 12:



CAUTION:

The following label indicates a hot surface nearby.



Statement 13:



DANGER

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your device for electrical specifications.

Statement 15:



CAUTION:

Make sure that the rack is secured properly to avoid tipping when the server unit is extended.

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cancer y de defectos congénitos, además de otros riesgos reproductivos. ***Lávese las manos después de usar el producto.***

Important:

All caution and danger statements in this documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in the IBM *Safety Information* book.

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

Chapter 1. Introduction

This *Installation Guide* contains instructions for setting up your IBM® @server® xSeries® 100 Type 8486 server and basic instructions for installing some options. More detailed instructions for installing options are in the *User's Guide* on the IBM *xSeries Documentation CD*, which comes with the server. This document contains information about:

- Setting up and cabling the server
- Starting and configuring the server
- Installing some options
- Solving problems

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

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

1. See <http://www.ibm.com/support/>.
2. Under **Search technical support**, type **xSeries 100** and click **Search**.

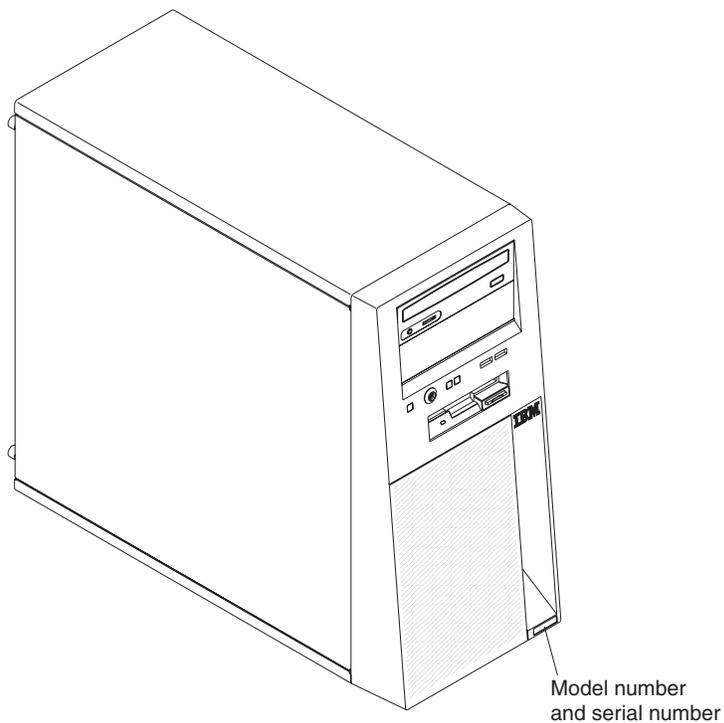
(Standard on some models only) The server comes with an IBM *ServerGuide™ Setup and Installation* CD to help you configure the hardware, install device drivers, and install the operating system.

The server comes with a limited warranty. You can obtain up-to-date information about your server and other IBM server products at <http://www.ibm.com/eserver/xseries/>.

Record information about the server in the following table. You will need this information when you register the server with IBM.

Product name	IBM @server xSeries® 100 server
Machine type	8486
Model number	_____
Serial number	_____
Key serial number	_____
Key manufacturer	_____
Key phone number	_____

The model number and serial number are on the label on the lower-right side of the bezel, as shown in the following illustrations. These illustrations might differ slightly from your hardware.



Important: The server keys cannot be duplicated by a locksmith. If you lose them, order replacement keys from the key manufacturer. The key serial number and the telephone number of the manufacturer are on a tag that is attached to the keys.

For a list of supported options for the server, see the ServerProven[®] Web site at <http://www.ibm.com/pc/compat/>.

The IBM xSeries Documentation CD

The IBM *xSeries Documentation* CD contains documentation for your server in Portable Document Format (PDF) and includes the IBM Documentation Browser to help you find information quickly.

Hardware and software requirements

The IBM *xSeries Documentation* CD requires the following minimum hardware and software:

- Microsoft® Windows NT® 4.0 (with Service Pack 3 or later), Windows 2000, or Red Hat Linux.
- 100 MHz microprocessor.
- 32 MB of RAM.
- Adobe Acrobat Reader 3.0 (or later) or xpdf, which comes with Linux operating systems. Acrobat Reader software is included on the CD, and you can install it when you run the Documentation Browser.

Using the Documentation Browser

Use the Documentation Browser to browse the contents of the CD, read brief descriptions of the documents, and view documents using Adobe Acrobat Reader or xpdf. The Documentation Browser automatically detects the regional settings in use in your server and displays the documents in the language for that region (if available). If a document is not available in the language for that region, the English language version is displayed.

Use one of the following procedures to start the Documentation Browser:

- If Autostart is enabled, insert the CD into the CD or DVD drive. The Documentation Browser starts automatically.
- If Autostart is disabled or is not enabled for all users, use one of the following procedures:
 - If you are using a Windows operating system, insert the CD into the drive; then, click **Start --> Run**. In the **Open** field, type
`e:\win32.bat`

where *e* is the drive letter of the drive, and click **OK**.

- If you are using Red Hat Linux, insert the CD into the drive and run the following command from the `/mnt/cdrom` directory:

```
sh runlinux.sh
```

Select the server from the **Product** menu. The **Available Topics** list displays all the documents for the server. Some documents might be in folders. A plus sign (+) indicates each folder or document that has additional documents under it. Click the plus sign to display the additional documents.

When you select a document, a description of the document appears under **Topic Description**. To select more than one document, press and hold the Ctrl key while you select the documents. Click **View Book** to view the selected document or documents in Acrobat Reader or xpdf. If you selected more than one document, all the selected documents are opened in Acrobat Reader or xpdf.

To search all the documents, type a word or word string in the **Search** field and click **Search**. The documents in which the word or word string appears are listed in

order of the most occurrences. Click a document to view it, and press Ctrl+F to use the Acrobat search function or Alt+F to use the xpdf search function within the document.

Click **Help** for detailed information about using the Documentation Browser.

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

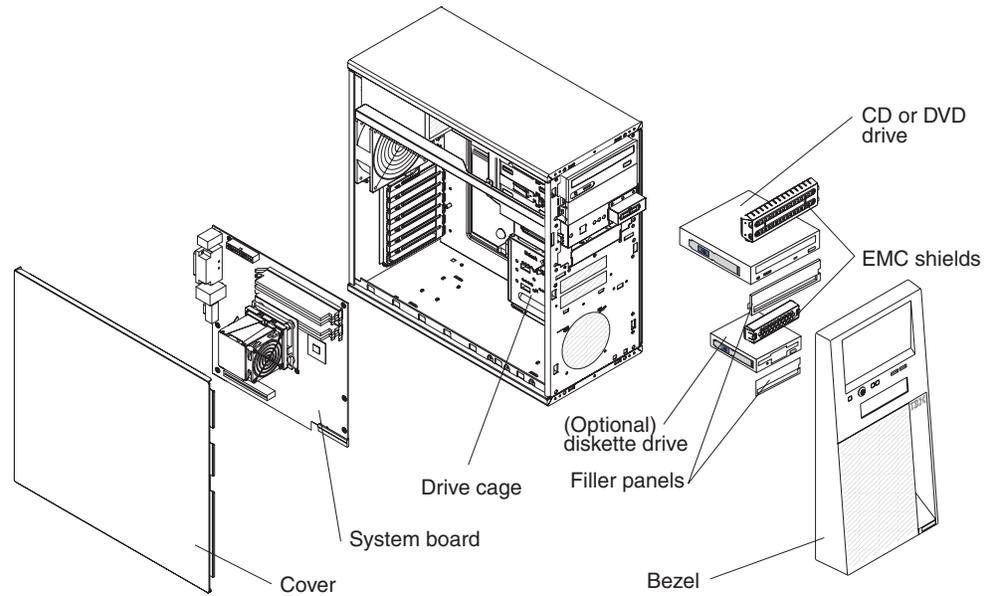
<p>Microprocessor:</p> <ul style="list-style-type: none"> Intel™ Pentium 4 or Celeron Processor 1 MB Level-2 or 256 KB level-2 cache 800 MHz front-side bus (FSB) or 533 MHz front-side bus <p>Memory:</p> <ul style="list-style-type: none"> Minimum: 256 MB Maximum: 8 GB Types: PC2-4200, double-data-rate 2 (DDR2) Connectors: four dual inline memory module (DIMM) connectors, two-way interleaved <p>Drives: (depending on your model)</p> <ul style="list-style-type: none"> Diskette: (optional) 1.44 MB (two mode) Hard disk drive: SATA One of the following IDE drives: <ul style="list-style-type: none"> CD-ROM CD-RW (optional) DVD-ROM (optional) DVD/CD-RW combo (optional) <p>Expansion bays: (depending on your model)</p> <ul style="list-style-type: none"> Two 5.25-in. bays (one CD or DVD drive installed) One 3.5-in. removable-media drive bay (optional) Two 3.5-in. hard disk drive bays (one hard disk drive installed) <p>PCI expansion slots:</p> <ul style="list-style-type: none"> One PCI Express x1 One PCI Express x8 Two PCI 32-bit/33 MHz <p>Video controller: ATI ES1000 video controller with 16 MB SDRAM video memory on the system board</p> <p>Fans:</p> <p>Two speed-controlled fans</p>	<p>Power supply: One 310 watt (90-240 V ac)</p> <p>Important: Make sure that the ac power supply input voltage is set to the right level (between 110 V ac or 220 V ac) for your geographic location before powering on the system.</p> <p>Size:</p> <ul style="list-style-type: none"> Height: 438 mm (17.24 in.) Depth: 497 mm (19.57 in.) Width: 205 mm (8.07 in.) Weight: 14 kg (30.86 lb) to 17 kg (37.48 lb) depending upon configuration <p>Integrated functions:</p> <ul style="list-style-type: none"> Broadcom 5721 10/100/1000 Ethernet controller on the system board with RJ-45 Ethernet port Two serial ports One parallel port Two-port Serial ATA controller 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 ATI ES1000 video <ul style="list-style-type: none"> Compatible with SVGA and VGA 16 MB video memory <p>Diagnostic LEDs:</p> <ul style="list-style-type: none"> Fans Memory Microprocessor <p>Acoustical noise emissions:</p> <ul style="list-style-type: none"> Sound power, idling: 5.0 bel Sound power, operating: 5.5 bel 	<p>Environment:</p> <ul style="list-style-type: none"> Air temperature: <ul style="list-style-type: none"> Server on: 10° to 35°C (50° to 95°F) Altitude: 0 to 914 m (2998.0 ft) Server off: 0° to 60°C (-32° to 140°F) Altitude: 0 to 2133 m (7000.0 ft) Humidity (operating and storage): 8% to 80% <p>Heat output:</p> <p>Approximate heat output in British thermal units (Btu) per hour</p> <ul style="list-style-type: none"> Minimum configuration: 379 Btu (111 watts) per hour Maximum configuration: 853 Btu (250 watts) per hour <p>Electrical input:</p> <ul style="list-style-type: none"> Sine-wave input (50 or 60 Hz) required Input voltage and frequency ranges manually selected Input voltage low range: <ul style="list-style-type: none"> Minimum: 100 V ac Maximum: 127 V ac Input voltage high range: <ul style="list-style-type: none"> Minimum: 200 V ac Maximum: 240 V ac Input kilovolt-amperes (kVA) approximately: <ul style="list-style-type: none"> Minimum: 0.15 kVA (all models) Maximum: 0.59 kVA <p>Notes:</p> <ol style="list-style-type: none"> Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use. 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.
--	---	--

Major components of the server

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.

The following illustration shows the major components in the server.

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



Chapter 2. Installing options

This chapter provides basic instructions for installing hardware options in the server. These instructions are intended for users who are experienced with setting up IBM server hardware. If you need more detailed instructions, see the *User's Guide* on the IBM *xSeries Documentation CD*.

Installation guidelines

Before you install options, read the following information:

- Read the safety information that begins on page v and the guidelines in “Handling static-sensitive devices” on page 8. This information will help you work safely.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- If you must start the server while the cover is removed, make sure that no one is near the server and that no tools or other objects have been left inside the server.
- Do not attempt to lift an object that you think is too heavy for you. If you have to lift a heavy object, observe the following precautions:
 - Make sure that you 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.
- 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 orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing and 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 finish 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/pc/us/compat/>.

System reliability guidelines

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

- Each of the drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed in it.

- There is adequate space around the server to allow the server cooling system to work properly. Leave approximately 50 mm (2.0 in.) of open space around the front and rear of the server. Do not place objects in front of the fans. For proper cooling and airflow, replace the server cover before turning on the server. Operating the server for extended periods of time (more than 30 minutes) with the server cover removed might damage server components.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan within 48 hours.
- You do not operate the server without the air baffle installed. Operating the server without the air baffle might cause the microprocessor to overheat.

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.

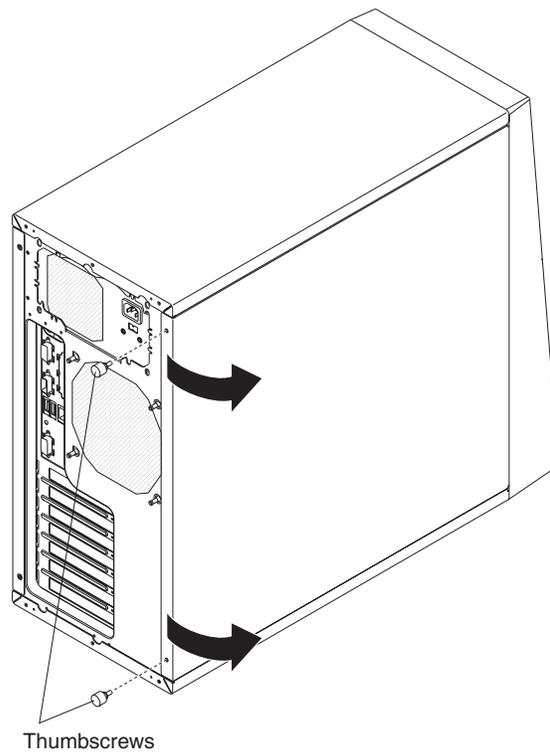
To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

- 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.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal part of the server for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the server without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the server cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Removing the side cover

To remove the server side cover, complete the following steps:

1. Read the safety information that begins on page v and the “Installation guidelines” on page 7.
2. Turn off the server and all attached devices (see “Turning off the server” on page 32); then, disconnect all power cords and external cables.
3. Lay the server on its side.
4. Remove the two thumbscrews from the rear of the server that secures the cover to the chassis. Slide the cover slightly toward the rear of the chassis and lift it off the server and set it aside.



To replace the side cover, see “Installing the side cover” on page 25.

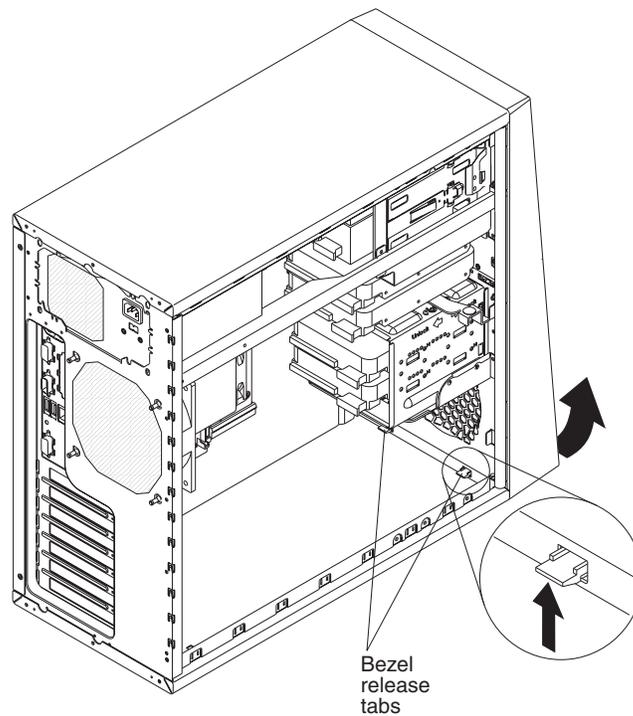
Attention: For proper cooling and airflow, replace the cover before turning on the server. Operating the server for extended periods of time (more than 30 minutes) with the cover removed might damage server components.

Removing the bezel

When working with some devices, such as additional optical drives, you must first remove the bezel to access the device.

To remove the bezel, complete the following steps:

1. Remove the side cover (see “Removing the side cover” on page 9).
2. From inside the server, locate the two bezel release tabs at the bottom of the bezel.



3. Press up slightly on both bezel release tabs while pulling the bottom of the bezel away from the server to disengage the tabs and remove the bezel.
4. Store the bezel in a safe place.

For instructions for replacing the bezel, see “Installing the bezel” on page 25.

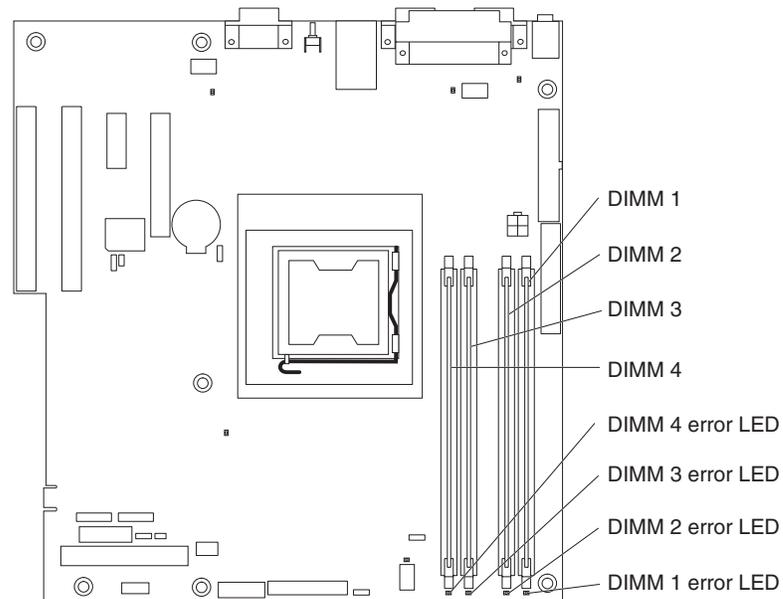
Installing a memory module

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

- The server supports industry-standard PC2-4200, double-data-rate 2 (DDR2) dual inline memory modules (DIMMs).
- The server supports a maximum of two hard disk drives, four DIMMs, and one 5.25-inch device; or, one hard disk drive, four DIMMs, and two 5.25-inch devices; or, two hard disk drives, two DIMMs, and two 5.25-inch devices.
- The system board contains four DIMM connectors and supports two-way memory interleaving.
- You can install one, two, or four DIMMs in the server, but not three DIMMs. It is not supported.
- The DIMM options that are available for the server are 256 MB, 512 MB, 1 GB, and 2 GB. The server supports a minimum of 256 MB and a maximum of 8 GB of system memory.
- The amount of usable memory will be reduced depending on the system configuration. A certain amount of memory must be reserved for system resources. The BIOS will display the total amount of installed memory and the amount of configured memory.
- The server comes with one 256 MB or 512 MB DIMM installed in the DIMM 1 memory connector. If the server has one DIMM installed, when you install an additional DIMM, it must be installed in the DIMM 3 connector, and it must be the same size, speed, type, and technology as the DIMM in the DIMM 1 connector. You can mix compatible DIMMs from various manufacturers. When one DIMM is installed, the server runs as a single-channel server. When you add a DIMM in the DIMM 3 connector, the server defaults to a dual-channel server.
- DIMMs must be installed in matched pairs. If you install a second pair of DIMMs in the DIMM 2 and DIMM 4 connectors, they do not have to be the same size, speed, type, and technology as the DIMMs in the DIMM 1 and DIMM 3 connectors. However, the size, speed, type, and technology of the DIMMs you install in the DIMM 2 and DIMM 4 connectors must match each other.
- Install only 1.8 V, 184-pin, double-data-rate 2 (DDR2), PC2-4200, unbuffered synchronous dynamic random-access memory (SDRAM) with error correcting code (ECC) DIMMs. These DIMMs must be compatible with the latest PC2-4200 SDRAM unbuffered DIMM specification. For a list of supported options for your server, go to <http://www.ibm.com/us/compat/>; then, select your country and navigate to the list of options for your computer.
- When you restart the server after adding or removing a DIMM, the server displays a message that the memory configuration has changed.

To install a DIMM, complete the following steps:

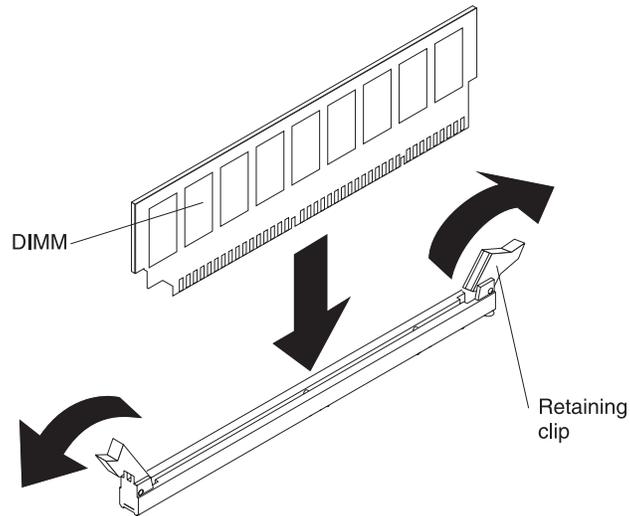
1. Locate the DIMM connectors on the system board. Determine the connectors into which you will install the DIMMs. Install the DIMMs in the sequence shown in the following table.



Memory installation sequence	
DIMMs	Slots
1 DIMM	1
2 DIMMs	1, 3
4 DIMMs	1, 2, 3, 4
Note: You can install one, two, or four DIMMs in the server, but not three DIMMs. Three DIMMs are not supported.	

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

2. Open the retaining clips and, if necessary, remove any existing DIMM.



3. 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.
4. Turn the DIMM so that the DIMM keys align correctly with the slot.
5. 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.

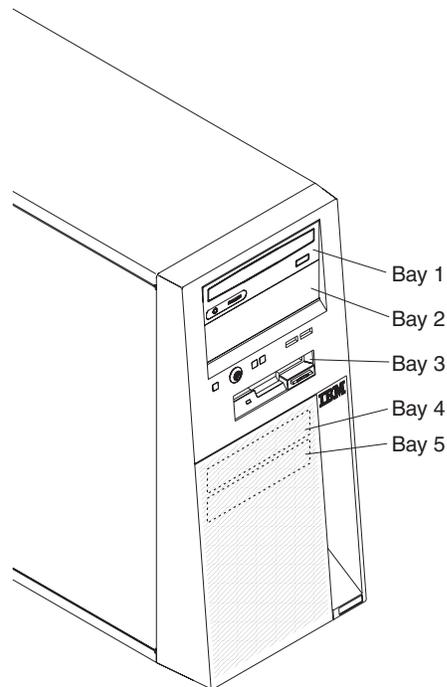
If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 25.

Installing a drive

Depending on the server model, one or more of the following drives might be installed in the server:

- Diskette (optional)
- Hard disk drive
- CD-ROM, CD-RW, or DVD/CD-RW combo

The server might come with an IDE CD-ROM drive in bay 1 and a 3.5-in. Serial ATA hard disk drive in bay 4.



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

- Read the documentation that comes with the drive and make sure that you have all the cables and other equipment specified in the documentation that comes with the drive.
- The server supports a maximum of two hard disk drives, four DIMMs, and one 5.25-inch device; or, one hard disk drive, four DIMMs, and two 5.25-inch devices; or, two hard disk drives, two DIMMs, and two 5.25-inch devices.
- Diskette drives, tape drives, CD-ROM, CD-RW/DVD combo drives are examples of removable-media drives. You can install removable-media drives in bays 1, 2, and 3 only.
- Only the optional diskette drive can be installed in bay 3. Other drives are not supported in bay 3.
- You can install SATA hard disk drives in bays 4 and 5 only.
- The integrated IDE controller in the server supports the connection of up to two IDE devices.
- The electromagnetic interference (EMI) integrity and cooling of the server are protected by having all bays and PCI or PCI Express slots covered or occupied.

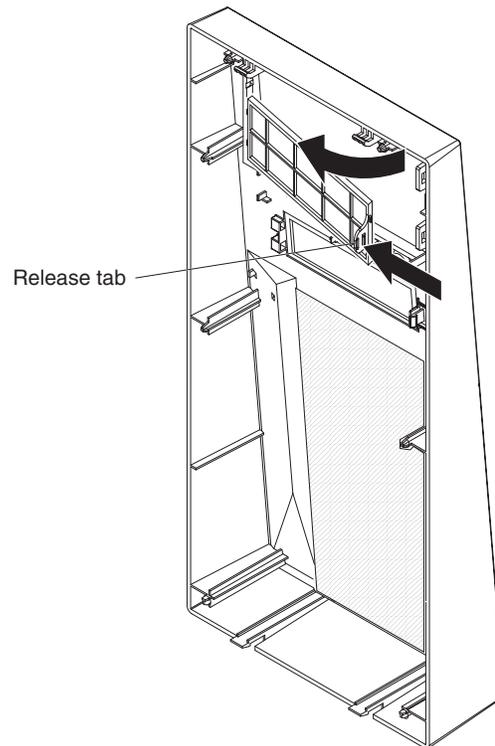
When you install a drive or PCI adapter, save the EMC shield and filler panel from the bay, the PCI or PCI Express adapter slot cover in the event you later remove the option.

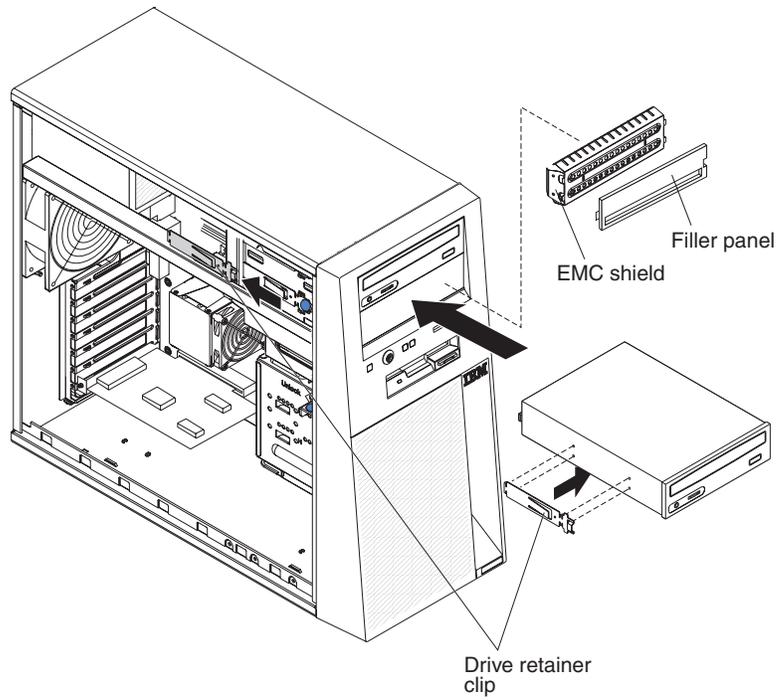
- For a complete list of supported options for the server, see <http://www.ibm.com/support/>.

Installing a removable-media drive in bay 2 or 3

To install a removable-media drive in bay 2 or 3, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 7.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables.
3. Remove the side cover (see “Removing the side cover” on page 9).
4. Remove the bezel (see “Removing the bezel” on page 10).
5. Use your fingers to press in on the drive-bay filler panel tab on the inside of the bezel and remove it from the bezel; then, pry the EMC shield away from the server. Store the filler panel and EMC shield in a safe place.





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

6. 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.
7. Set any jumpers or switches on the drive according to the documentation that comes with the drive.
8. Remove the drive retainer clip (located on the side of the drive cage) for the bay in which you want to install the drive (see the illustration on page 16). Slide the drive retainer clip to the left to remove it from the drive cage; then, snap the drive retainer clip into the screw holes on the side of the drive (the blue side of the drive clip should be facing outward).
9. Align the drive assembly with the guide rails in the bay. Push the drive into the bay.

Note: Only an optional diskette drive can be installed in bay 3.

10. Connect one end of the signal cable into the back of the drive and make sure that the other end of this cable is connected into the IDE connector on the system board.
11. Route the signal cable so that it does not block the airflow to the rear of the drives or over the microprocessor and DIMMs.
12. Connect the power cable to the back of the drive. The connectors are keyed and can be inserted only one way.

If you have other options to install or remove, do so now; otherwise, replace the side cover (see “Installing the side cover” on page 25 and replace the bezel (see “Installing the bezel” on page 25); then, go to “Completing the installation” on page 25.

Installing a SATA hard disk drive in bay 5

The server come with a Serial ATA (SATA) hard disk drive. Before you install a SATA hard disk drive, read the following information:

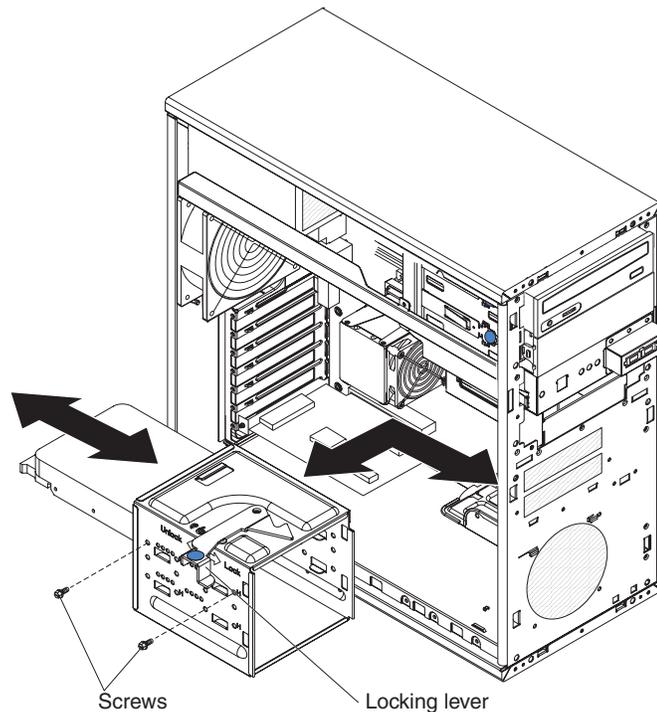
- Read the documentation that comes with the drive for cabling instructions.
- Route the cable before you install the drive. Do not block the airflow from the fans.
- You can install two SATA hard disk drives in the server.

Note: Each Serial ATA drive comes with a cable. If you install an additional Serial ATA drive, you will need an additional cable. If you install the optional ServeRAID-7t S-ATA controller, all SATA drives must be connected to the ServeRAID-7t S-ATA controller instead of the system board. The controller comes with two cables. See the optional ServeRAID-7t S-ATA controller documentation for cabling instructions. You can install the optional ServeRAID-7t S-ATA controller in slot 3 or slot 4.

To install a SATA hard disk drive, complete the following steps:

1. Read the safety information that begins on page v and the “Installation guidelines” on page 7.
2. Turn off the server and peripheral devices and disconnect all external cables and power cords.
3. Remove the side cover (see “Removing the side cover” on page 9).

4. Move the drive cage release lever to the unlocked position and gently pull the drive cage out of the drive cage slot on the chassis and set it aside.



5. 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.
Note: If the hard disk drive comes attached to a drive tray, remove the drive from the drive tray before you install the drive in the drive bay.
6. Set any jumpers or switches on the drive according to the documentation that comes with the drive.
7. Align the drive assembly with the guide rails in the bay (with the connector end of the drive facing you).
8. Gently slide the drive assembly into the drive bay as far as it will go.
9. Attach the hard disk drive to the drive cage with the four screws.
10. Connect one end of the signal cable into the back of the drive and make sure that the other end of the cable is connected into the connector on the system board. See “Power and signal cables for internal drives” on page 20 for additional information about cabling drives and “System-board internal connectors” in the *User’s Guide* for the location of the SATA or SCSI connectors on the system board. If there are open connectors on the cables that connect existing SCSI drives, you can use these cables to connect the new drive.
11. Route the signal cable so that it does not block the airflow to the rear of the drives or over the microprocessor and DIMMs.
12. Connect the power cable to the back of the drive. The connectors are keyed and can be inserted only one way.

If you have other options to install or remove, do so now. Otherwise, go to “Completing the installation” on page 25.

Power and signal cables for internal drives

The server uses cables to connect parallel IDE, Serial ATA, and SCSI devices (such as tape devices) to the power supply and to the system board. (See the *User's Guide* for the location of system-board internal connectors.) Review the following information before connecting power and signal cables to internal drives:

- The drives that are preinstalled in the server come with power and signal cables attached. If you replace any drives, remember which cable is attached to which drive.
- When you install a drive, make sure that one of the signal cable drive connectors is connected to the drive and that the connector at the other end of the signal cable is connected to the system board.
- If you have only one IDE device on a cable, it must be set as a master device.
- If two IDE devices are used on a single cable, one must be designated as the master device and the other as the subordinate device; otherwise, the server might not recognize some of the IDE devices. The master and subordinate designation is determined by switch or jumper settings on each IDE device.

The following cables are provided:

- **Power cables:** Four-wire power cables connect the drives to the power supply. At the end of these cables are plastic connectors that can be attached to different drives; these connectors vary in size. Use either a four-wire power cable or Serial ATA power cable with Serial ATA drives, but do not use both at the same time (use one or the other).
- **Signal cables:** Signal cables are typically flat cables, also called ribbon cables, that connect parallel IDE, Serial ATA, SCSI, and diskette drives to the system board. Two or three types of signal cables come with the server:
 - **IDE:** The wider IDE signal cable has three connectors. One of these connectors is attached to the drive, one is a spare, and the third is attached to the primary or secondary IDE connector on the system board. The spare connector can be used to connect an additional IDE drive to the server.
The CD or DVD drive is attached to an ATA 100 signal cable. ATA 100 signal cables are color-coded. The blue connector is attached to the system board. The black connector is attached to the master IDE device. The gray middle connector is attached to the subordinate IDE device.
 - **Diskette drive:** The narrower signal cable has two connectors. One is attached to the diskette drive, and the other is connected to the connector (FDD1) on the system board.
 - **Serial ATA (SATA):** The narrower, black signal cable has two connectors. One is connected to the Serial ATA drive, and the other is attached to the connector on the system board. Each Serial ATA drive comes with a cable. If you install an additional Serial ATA drive, you will need an additional cable.
If you install the optional ServeRAID-7t S-ATA controller, all SATA drives must then be connected to the ServeRAID-7t S-ATA controller instead of the system board. The controller comes with two cables. See the optional ServeRAID-7t S-ATA controller documentation for cabling instructions.
 - **SCSI:** A round SCSI cable connects SCSI devices to the SCSI controller on the system board.
 - A SCSI cable connects external SCSI devices to an optional SCSI controller. For more information about connecting SCSI devices, see the SCSI documentation.

Installing an adapter

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

- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this section. If you need to change the switch setting or jumper settings on the adapter, follow the instructions that come with the adapter.
- Read the documentation that comes with the operating system.
- The server comes with two PCI Express slots and two PCI slots.
- You can install full-length adapters in PCI slots 3 and 4.
- You can install only 32-bit/33 MHz adapters in the 32-bit PCI slots 3 and 4.
- The 32-bit PCI slots 3 and 4 support 5.0 V signaling PCI adapters; they do not support 3.3 V keyed adapters. However, 64-bit adapters are supported if they are universal adapters.
- The slot 1, PCI Express x8 and slot 2, PCI Express x1 support any PCI Express adapter that is on the ServerProven list.
- The server scans the PCI Express x8 slot (slot 1), PCI Express x1 slot (slot 2), and PCI slots 3 and 4 to assign system resources. Then, the server starts the PCI and PCI Express devices in the following order, if you have not changed the default startup sequence: PCI Express x8, PCI Express x1, system-board integrated drive electronics (IDE) or SCSI devices, and then PCI slots 3 and 4.
- For a list of supported options for the server, see <http://www.ibm.com/support/>.

To install an adapter, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 7.
2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the side cover. See “Removing the side cover” on page 9.
3. Follow the instructions that come with the adapter for requirements, restrictions, or cabling instructions. It might be easier to route any cables before you install the adapter.
4. Remove the screw from the expansion-slot; then, remove the expansion-slot cover. From the rear of the server, press on the slot cover. Grasp it and pull it out of the expansion slot. Store it in a safe place for future use.

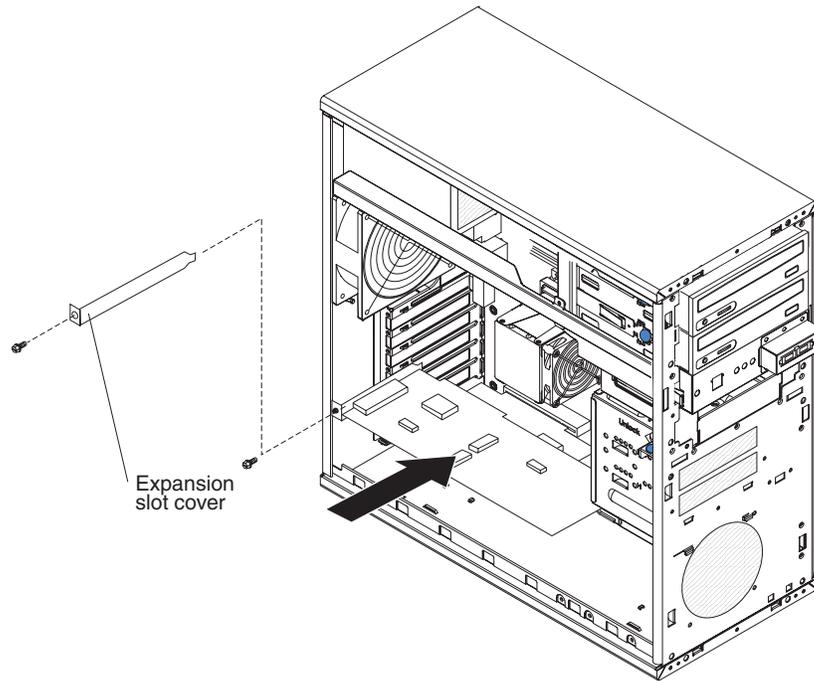
Note: Expansion-slot covers must be installed on all vacant slots. This maintains the electronic emissions standards of the server and ensures proper ventilation of server components.

5. 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.
6. Follow the instructions that come with the adapter to set jumpers or switches, if any.

Attention: Avoid touching the components and gold-edge connectors on the adapter.

7. Carefully grasp the adapter by the top edge or upper corners, and align it with the expansion-slot guides; then, press the adapter *firmly* into the expansion slot. Move the adapter directly from the static-protective package to the expansion slot.

Attention: Make sure that the adapter is correctly seated in the expansion slot before you turn on the server. Incomplete installation of an adapter might damage the system board or the adapter.



8. Reinstall the screw that you removed from the expansion slot earlier to secure the adapter to the chassis.
9. Connect required cables to the adapter. Route cables so that they do not block the flow of air from the fans. If you are installing an optional SCSI adapter, see “Cabling an optional SCSI adapter” on page 23 for additional information.
10. If you have other options to install or remove, do so now.
11. Go to “Completing the installation” on page 25.

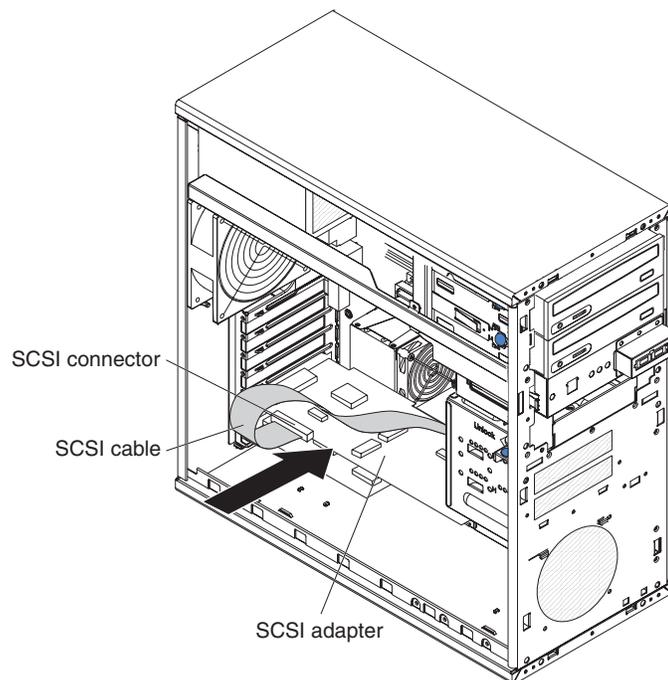
Cabling an optional SCSI adapter

You can install an optional SCSI adapter in the server to control internal tape drives. You can also cable a SCSI adapter to external hard disk drives. See your SCSI adapter option documentation for complete instructions for installing a SCSI adapter in the server and for additional information about SCSI adapters.

Note: An optional SCSI adapter or cable option is required to connect external SCSI devices.

To cable an optional SCSI adapter, complete the following steps:

1. Install the SCSI adapter (see “Installing an adapter” on page 21).
2. Connect the SCSI signal cable to the adapter and to one or more of the connectors on the rear of the SCSI devices.



3. Complete the installation of the optional SCSI adapter.

Installing a security rope clip

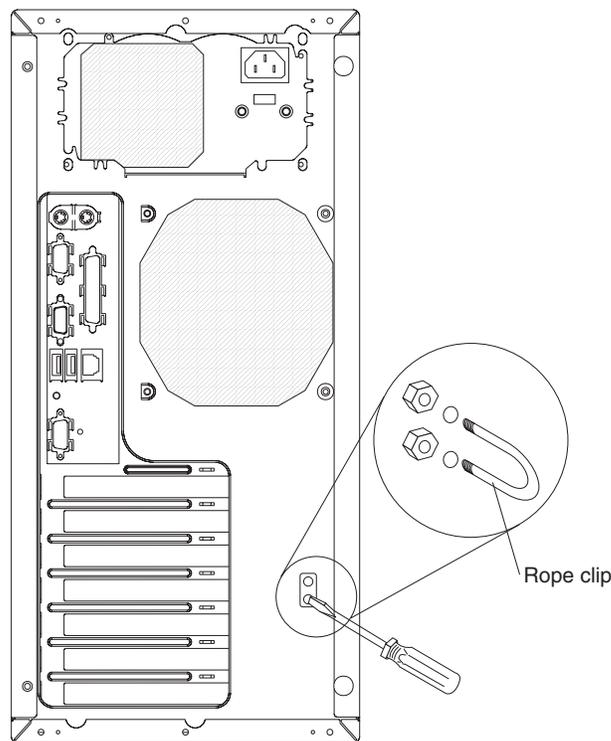
To help prevent hardware theft, you can add a security rope clip and cable to the server. After you add the security cable, make sure that it does not interfere with other cables that are connected to the server.

Before you begin, obtain the following items:

- A flat-blade screwdriver
- An adjustable wrench
- A 19 mm (0.75 in.) rope clip or wire rope (similar to National Manufacturing number 3230, stock number 176-735)
- Threaded nuts that fit the rope clip
- A security cable
- A lock, such as a combination lock or padlock

To install a rope clip, complete the following steps:

1. Turn off the server and all attached devices. Disconnect all external cables and power cords; then, remove the side cover. See “Removing the side cover” on page 9.
2. Use a screwdriver to remove the two metal knockouts.
3. Insert the rope clip through the rear panel; then, attach and tighten the nuts.
4. Thread the cable through the rope clip and around an object that is not part of or permanently secured to the building structure or foundation, and from which the cable cannot be removed. Fasten the cable ends together with a lock. After you add the security cable, make sure that it does not interfere with other cables that are connected to the server.



5. Replace the side cover (see “Installing the side cover” on page 25).

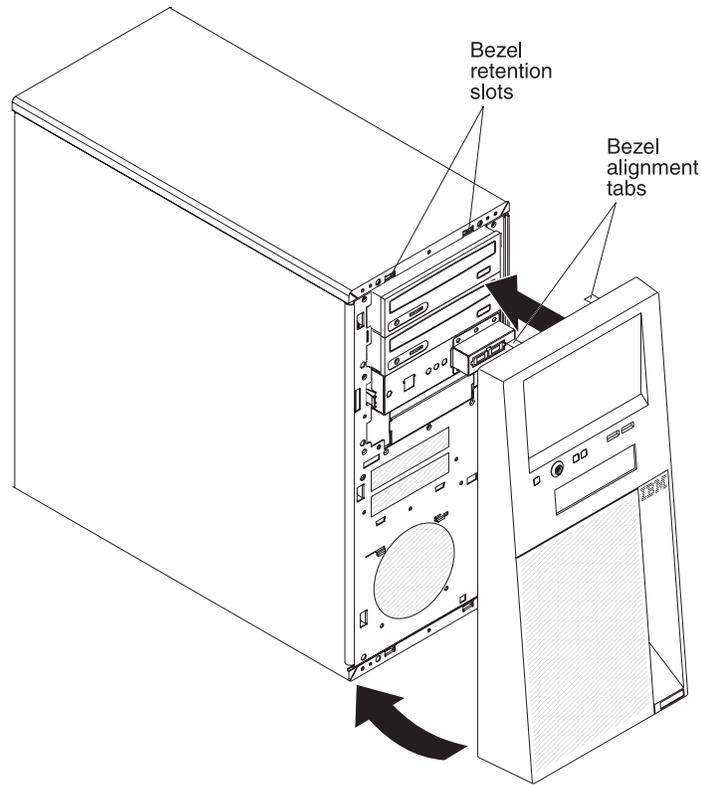
Completing the installation

To complete the installation, you must reinstall the bezel, reinstall the side cover, connect all the cables and, for certain options, run the Configuration/Setup Utility program. Follow the instructions in this section.

Installing the bezel

To replace the bezel, complete the following steps:

1. Insert the two alignment tabs at the top of the bezel into the bezel retention slots at the top of the chassis.



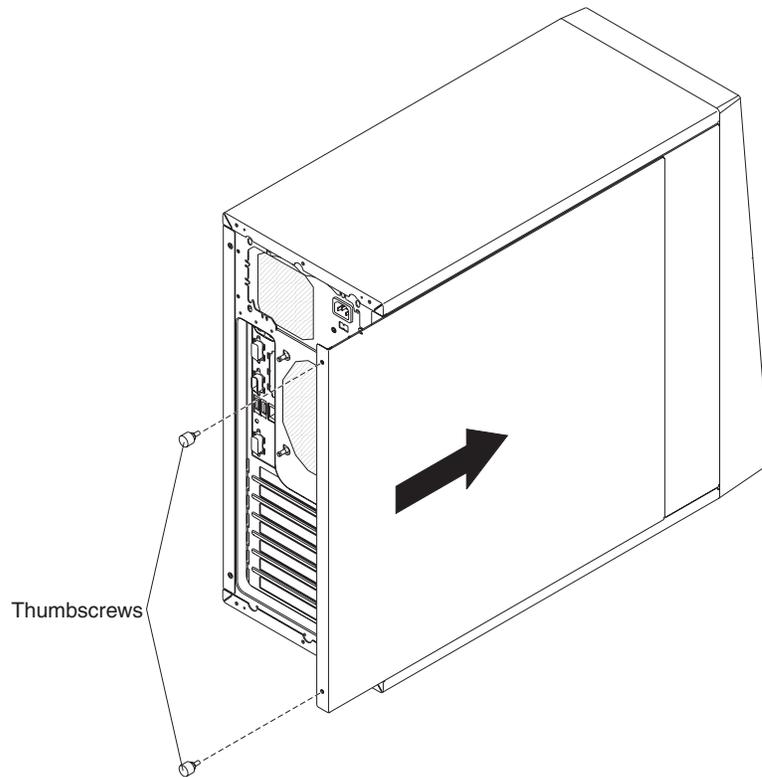
2. Push the bottom of the bezel toward the server until the bezel snaps into place.

Installing the side cover

Note: You might find it easier to lay the server on its side to replace the side cover.

To replace the side cover, complete the following steps:

1. Before installing the cover, check that all cables, adapters, and other components are installed and seated correctly and that you have not left loose tools or parts inside the server.
2. Align the cover over the server (with the rear of the cover slightly hanging off the rear of the server) and slide the cover toward the front of the server until it is completely closed.



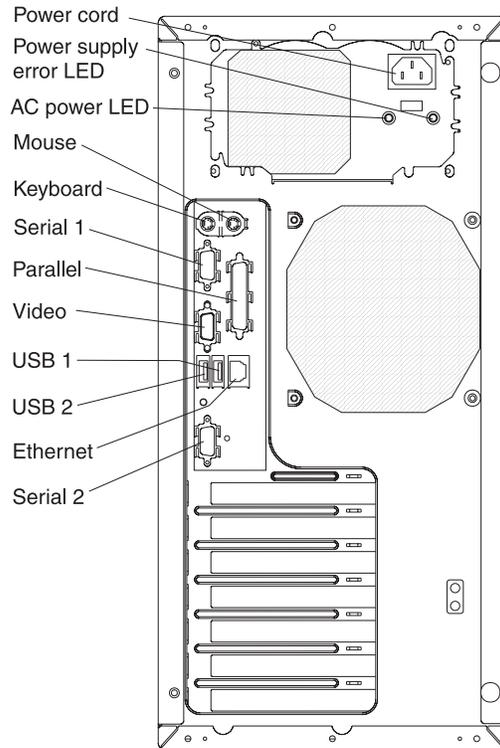
3. Use the two thumbscrews that you removed earlier to secure the cover to the server chassis.

Connecting the cables

If the server cables and connector panel have color-coded connections, match the color of the cable end with the color of the connector. For example, match a blue cable end with a blue panel connector, a red cable end with a red connector, and so on.

Attention: To prevent damage to equipment, connect the power cords last.

The following illustration shows the input/output (I/O) connectors on the rear of the server.



Updating the server configuration

When you start the server for the first time after you add or remove an internal option or an external SCSI device, you might receive a message that the configuration has changed. The Configuration/Setup Utility program starts automatically so that you can save the new configuration settings. See Chapter 4, “Configuring the server,” on page 35 for additional information.

Some options have device drivers that you must install. See the documentation that comes with each option for information about installing device drivers.

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

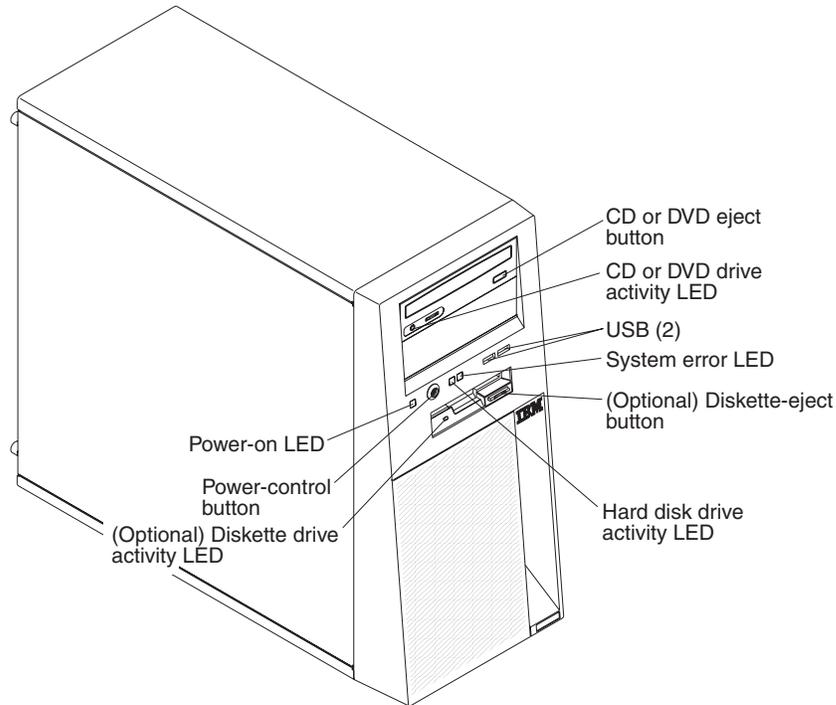
For information about configuring the integrated Gigabit Ethernet controller, see the *User's Guide*.

Chapter 3. Server controls, LEDs, and power

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

Front view

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



CD or DVD-eject button

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

CD or DVD drive activity LED

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

USB connectors

Connect a USB device to these connectors.

System-error LED

When this LED is lit, it indicates that a system error has occurred. A LED on the system board might also be lit to help isolate the error. See Chapter 5, "Solving problems," on page 39 for additional information. Detailed troubleshooting information is in the *Problem Determination and Service Guide* on the IBM xSeries Documentation CD.

(Optional) Diskette-eject button

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

Hard disk drive activity LED

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

(Optional) Diskette drive activity LED

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

Power-control button

Press this button to turn the server on and off manually. A power-control-button shield comes with the server.

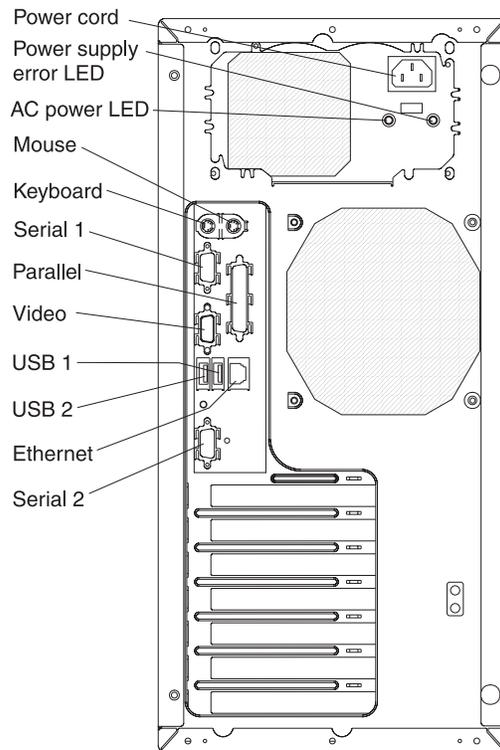
Power-on LED

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 cord from the electrical outlet.

Rear view

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



Power-cord connector

Connect the power cord to this connector.

Power supply error LED

When this amber LED is lit, it indicates that a power supply error has occurred.

AC power LED

When this green LED is lit, it indicates that the server is connected to an ac power source.

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 1 connector

Connect a USB device to this connector.

USB 2 connector

Connect a USB device to this connector.

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 link status LED

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

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.

Server power features

When the server is connected to an ac power source but is not turned on, the operating system does not run, and all core logic is shut down; however, the server can respond to remote requests to turn on the server. The power-on LED flashes to indicate that the server is connected to an ac power source but is not turned on.

Turning on the server

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

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

- If a power failure occurs while the server is turned on, the server will restart automatically when power is restored.
- If your operating system supports the Wake on LAN feature, the Wake on LAN feature can turn on the server.

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

Turning off the server

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

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

Statement 5:



CAUTION:

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



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

- You can turn off the server from the operating system, if your operating system supports this feature. After an orderly shutdown of the operating system, the server will be turned off automatically.
- You can press the power-control button to start an orderly shutdown of the operating system and turn off the server, if your operating system supports this feature.
- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the server.
- If the Wake on LAN feature turned on the server, the Wake on LAN feature can turn off the server.
- The server can turn itself off as an automatic response to a critical system failure.

Chapter 4. Configuring the server

The *ServerGuide Setup and Installation* CD provides software setup tools and installation tools that are specifically designed for your IBM® server. Use this CD during the initial installation of your server to configure basic hardware features and to simplify your operating system installation. (See “Using the ServerGuide Setup and Installation CD” 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
- Boot Menu program
- Broadcom NetXtreme Gigabit Ethernet Boot Agent
- Ethernet controller configuration

For more information about these programs, see “Configuring your 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 your server, you can download the latest version from the ServerGuide Web page at <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 46.
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 your 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 and watch the monitor screen.
2. When the message Press F1 for Configuration/Setup appears, press F1. If an administrator password has been set, you must type the administrator password to access the full Configuration/Setup Utility menu.
3. Follow the instructions on the screen.

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

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.

Enabling the Broadcom NetXtreme Gigabit Ethernet Boot Agent

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

To enable the Broadcom NetXtreme Gigabit Ethernet Boot Agent, complete the following steps:

1. Turn on the server.
2. When the prompt Press F1 for Configuration/Setup appears during startup, press F1.
3. From the Configuration/Setup Utility main menu, select **Devices and I/O Ports** and press Enter.
4. Select **System Board Ethernet PXE/DHCP** and use the Right Arrow (→) key to set it to **Enabled**.
5. Select **Save Settings** and press Enter.

Configuring the Broadcom NetXtreme Gigabit Ethernet controller

The Ethernet controller is integrated on the system board. It provides an interface for connecting to a 10-Mbps, 100-Mbps, or 1-Gbps network and provides full duplex (FDX) capability, which enables simultaneous transmission and reception of data on the network. If the Ethernet port in the server supports 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 when you install a different operating system to enable the operating system to address the controller. For device drivers and information about configuring the Gigabit Ethernet controller, go to <http://www.ibm.com/support/>.

Chapter 5. Solving problems

This section provides basic troubleshooting information to help you solve some common problems that might occur while you are setting up 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 59, the *Problem Determination and Service Guide* on the IBM xSeries Documentation CD, and the “Server Support” flowchart inside the front cover of this document.

Diagnostic tools overview

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

- **POST beep codes**

The power-on self-test (POST) codes indicate the detection of a problem.

- One beep indicates successful completion of POST, with no errors.
- More than one beep indicates that POST detected a problem. Error messages also appear during startup if POST detects a hardware-configuration problem.

See “POST beep codes” in the *Problem Determination and Service Guide* on the IBM xSeries Documentation CD for more information.

- **ServerGuide problems**

This table lists problem symptoms and steps to correct problems that occur when you are using the *ServerGuide Setup and Installation* CD. See the “ServerGuide problems” on page 46 for information.

- **Troubleshooting tables**

These tables list problem symptoms and steps to correct the problems. See “Troubleshooting tables” on page 47 for more information.

- **Diagnostic programs and error messages**

The system diagnostic programs are provided the IBM Enhanced Diagnostics CD. These programs test the major components of the server. See “POST beep codes” on page 40 and the *Problem Determination and Service Guide* on the IBM xSeries Documentation CD for more information.

- **System-board error LEDs**

A LED on the system board might also be lit to help isolate an error that is indicated by the system error LED on the front of the server. See “System-board error LEDs” on page 57 for more information.

POST beep codes

POST emits one beep to signal successful completion. If POST detects a problem during startup, other beep codes might occur. Use the following beep code descriptions to help diagnose and solve problems that are detected during startup.

Note: See the *Problem Determination and Service Guide* on the IBM xSeries Documentation CD for more information about the POST beep codes.

Repeating long beeps

A memory error has occurred. Make sure that all DIMMs are correctly installed. For additional information, see beep code 3-3-3 in the *Problem Determination and Service Guide* on the IBM xSeries Documentation CD.

Other beep codes

See the *Problem Determination and Service Guide* on the IBM xSeries Documentation CD for information about other beep codes.

POST error codes

The following table provides an abbreviated list of the error messages that might appear during POST. See the *Problem Determination and Service Guide* on the IBM xSeries Documentation CD for more information about the POST error messages. See <http://www.ibm.com/support/> to check for updated technical information.

<ul style="list-style-type: none">• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.• See the parts listing in the Problem Determination and Service Guide 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	The server failed to start on three consecutive boots using the default configuration.	<ol style="list-style-type: none">1. Flash the system firmware to the latest level.2. (Trained service technician only) Replace the system board.
101, 102	A tick timer internal interrupt, internal timer channel 2 error occurred.	(Trained service technician only) Replace the system board.
151	A real-time clock error occurred.	<ol style="list-style-type: none">1. Reseat the battery.2. Replace the following components one at a time, in the order shown, restarting the server each time.<ol style="list-style-type: none">a. Batteryb. (Trained service technician only) System board
161	A real-time clock battery error occurred.	<ol style="list-style-type: none">1. Reseat the battery.2. Replace the following components one at a time, in the order shown, restarting the server each time.<ol style="list-style-type: none">a. Batteryb. (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 the parts listing in the Problem Determination and Service Guide 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
162	A change in device configuration error occurred.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program, select Load Default Settings, and save the settings. 2. Reseat the following components: <ol style="list-style-type: none"> a. Battery b. Failing device (if the device is a FRU, then the device should be replaced by a trained service technician only) 3. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> a. Battery b. Failing device (if the device is a FRU, then the device should be replaced by a trained service technician only) c. (Trained service technician only) System board
163	A real-time clock error occurred.	<ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> a. Battery b. (Trained service technician only) System board
175	A bad EEPROM CRC#1 error occurred.	<ol style="list-style-type: none"> 1. Restart the server. 2. Update the firmware. 3. (Trained service technician only) Reseat the microprocessor. 4. (Trained service technician only) Replace the microprocessor.
184	The power-on password is damaged.	<ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> 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 the parts listing in the Problem Determination and Service Guide 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
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.	<ol style="list-style-type: none"> 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. 3. Reseat the DIMM. 4. Replace the DIMM.
301	A keyboard or keyboard controller error occurred.	<ol style="list-style-type: none"> 1. If you have installed a USB keyboard, run the Configuration/Setup Utility program and enable keyboardless operation to prevent this error message 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. <ol style="list-style-type: none"> a. Keyboard b. (Trained service technician only) System board
303	A keyboard controller error occurred.	<ol style="list-style-type: none"> 1. Reseat the keyboard cable. 2. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> a. Keyboard b. (Trained service technician only) System board
1600	A service processor error occurred.	<ol style="list-style-type: none"> 1. Restart the server. 2. Update the firmware.
178x	A fixed disk error occurred.	<ol style="list-style-type: none"> 1. Reseat the hard disk drive cable. 2. Replace the hard disk drive cable. 3. Run the hard disk drive diagnostic tests (see the <i>Problem Determination and Service Guide</i> for information about running the diagnostic tests). 4. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> a. Hard disk 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 the parts listing in the Problem Determination and Service Guide 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
1800	An unavailable PCI hardware interrupt occurred.	<ol style="list-style-type: none"> 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.
1801	A PCI adapter has requested memory resources that are not available.	<ol style="list-style-type: none"> 1. Change the order of the adapters in the PCI slots. Make sure that the boot device is positioned early in the scan order (see the <i>User's Guide</i> for information about the scan order). 2. 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. 3. 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.
1962	A hard disk drive does not contain a valid boot sector.	<ol style="list-style-type: none"> 1. Make sure that a bootable operating system is installed. 2. Run the hard disk drive diagnostic tests (see the <i>Problem Determination and Service Guide</i> for information about running the diagnostic tests). 3. Reseat the hard disk drive cable. 4. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> a. Hard disk drive cable b. Hard disk drive c. (Trained service technician only) System board
5962	IDE CD or DVD drive configuration error.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and load the default settings. 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. <ol style="list-style-type: none"> a. CD or DVD drive cable b. CD or DVD drive 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 the parts listing in the Problem Determination and Service Guide 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
8603	A pointing-device error occurred.	<ol style="list-style-type: none"> 1. Reseat the pointing device cable. 2. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> a. Pointing device b. (Trained service technician only) System board
12000	A processor machine check error occurred.	<ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor b. (Trained service technician only) System board
00019701	Processor failed built-in self test (BIST).	<ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor b. (Trained service technician only) System board
01298101	A bad update data for processor error occurred.	<ol style="list-style-type: none"> 1. Update the BIOS code. 2. (Trained service technician only) Reseat the microprocessor. 3. (Trained service technician only) Replace the microprocessor.
I9990301	A hard disk drive boot sector error occurred.	<ol style="list-style-type: none"> 1. Reseat the hard disk drive cable. 2. Reseat the hard disk drive. 3. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> a. Hard disk drive cable b. Hard disk drive 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 the parts listing in the Problem Determination and Service Guide 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
19990305	An operating system was not found.	<ol style="list-style-type: none"> 1. Make sure that a bootable operating system is installed. 2. Run the hard disk drive diagnostic tests (see the <i>Problem Determination and Service Guide</i> for information about running the diagnostic tests). 3. Reseat the following components: <ol style="list-style-type: none"> a. Hard disk drive cable b. Hard disk drive. 4. Replace the following components one at a time, in the order shown, restarting the server each time. <ol style="list-style-type: none"> a. Hard disk drive cable b. Hard disk drive c. (Trained service technician only) System board
19990650	The ac power has been restored.	<ol style="list-style-type: none"> 1. Reseat the power cord. 2. Check for the interruption of external power source. 3. Replace the power cord.

ServerGuide problems

The following table lists problem symptoms and suggested solutions.

Table 2. ServerGuide Setup and Installation CD

Symptom	Action
The <i>ServerGuide Setup and Installation</i> CD will not start.	<ul style="list-style-type: none">• 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 altered, 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 or DVD from the primary drive.
The SCSI RAID program cannot view all installed drives or the operating system cannot be installed.	<ul style="list-style-type: none">• Make sure that there are no duplicate SCSI IDs or 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 <i>ServerGuide Setup and Installation</i> CD label for a list of supported operating-system versions.
The operating system cannot be installed; the option is not available.	Make sure that the operating-system CD is supported on your server. If the operating system is supported, either there is no logical drive defined (SCSI RAID systems) or the ServerGuide System Partition is not present. Run the ServerGuide program and make sure that setup is complete.

Troubleshooting tables

Use the troubleshooting tables to find solutions to problems that have identifiable symptoms. See the *Problem Determination and Service Guide* on the IBM xSeries Documentation CD for more detailed troubleshooting information. If you cannot find the problem in these tables, run the diagnostic programs (see “Running the diagnostic programs” in the *Problem Determination and Service Guide*).

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

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 the parts listing in Problem Determination and Service Guide 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
CD or DVD drive is not recognized.	<ol style="list-style-type: none">1. Make sure that:<ul style="list-style-type: none">• 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 CD or DVD drive diagnostic programs.3. Reseat the following components:<ol style="list-style-type: none">a. CD or DVD driveb. CD or DVD drive cablec. (Trained service technician only) System board4. Replace the following components one at a time, in the order shown, restarting the computer each time:<ol style="list-style-type: none">a. CD or DVD driveb. CD or DVD drive cablec. (Trained service technician only) System board

Diskette drive problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide 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 computer bypasses the diskette drive.	<ol style="list-style-type: none"> 1. If there is a diskette in the drive, make sure that: <ul style="list-style-type: none"> • The diskette drive is enabled in the Configuration/Setup Utility program. • The diskette is good and not damaged. (Try another diskette if you have one.) • The diskette is inserted correctly in the drive. • The diskette contains the necessary files to start the computer. • The software is working correctly. • The cable is connected correctly (in the proper orientation). 2. To prevent diskette drive read/write errors, make sure that the distance between monitors and diskette drives is at least 76 mm (3 in.). 3. Run the diskette drive diagnostic test. 4. Reseat the following components: <ol style="list-style-type: none"> a. Cable b. Diskette drive c. (Trained service technician only) System board 5. Replace the following components one at a time, in the order shown, restarting the computer each time: <ol style="list-style-type: none"> a. Cable b. Diskette drive c. (Trained service technician only) System board

General problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide 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 indicator LED is not working, or a similar problem has occurred.	If the part is a CRU, replace it. If the part is a FRU, the part must be replaced by a trained service technician.

Hard disk drive problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide 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).	Remove the drive that is indicated by the diagnostic tests; then, run the hard disk drive diagnostic test again. If the remaining drives are recognized, replace the drive that you removed with a new one.
The computer stops responding during the hard disk drive diagnostic test.	Remove the hard disk drive that was being tested when the computer 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. Note: This test is not available on computers that have RAID arrays or computers that have IDE or SATA hard disk drives.

Intermittent problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide 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 detect.	Make sure that: <ul style="list-style-type: none"> • All cables and cords are connected securely to the rear of the computer and attached options. • When the computer is turned on, air is flowing from the rear of the computer at the fan grille. If there is no airflow, the fan is not working. This can cause the computer to overheat and shut down. • Make sure that the SCSI bus and devices are configured correctly and that the last external device in each SCSI chain is terminated correctly.

Keyboard, mouse, or pointing-device problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See the parts listing in Problem Determination and Service Guide 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.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The keyboard cable is securely connected to the computer, and the keyboard and mouse cables are not reversed. • The computer and the monitor are turned on. 2. Replace the following components one at a time, in the order shown, restarting the computer each time: <ol style="list-style-type: none"> a. Keyboard b. (Trained service technician only) System board
The mouse or pointing device does not work.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The mouse or pointing-device cable is securely connected and the keyboard and mouse cables are not reversed. • The mouse or pointing device drivers are installed correctly. 2. Replace the following components one at a time, in the order shown, restarting the computer each time: <ol style="list-style-type: none"> a. Mouse or pointing device b. (Trained service technician only) System board

Memory problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide 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 displayed is less than the amount of installed physical memory.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • 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 banks of memory are enabled. The computer might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled. 2. Check the POST error log for error message 289: <ul style="list-style-type: none"> • If the DIMM was disabled by a system-management interrupt (SMI), replace the DIMM. • If the DIMM was disabled by the user or by POST, run the Configuration/Setup Utility program and enable the DIMM. Save the settings and restart the computer. 3. Replace the following components one at a time, in the order shown, restarting the computer each time: <ol style="list-style-type: none"> a. DIMM b. (Trained service technician only) System board

Microprocessor problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide 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 computer emits a continuous beep during POST, indicating that the startup (boot) microprocessor is not working correctly.	<ol style="list-style-type: none"> 1. (Trained service technician only) Make sure that the startup microprocessor is seated correctly. 2. (Trained service technician only) Replace the microprocessor.

Monitor problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide 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.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The computer power cord is connected to the computer and a working electrical outlet. • The monitor cables are connected correctly. • The monitor is turned on and the brightness and contrast controls are adjusted correctly. <p>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 set to enabled (its default setting), you must restart the computer three times to force the system BIOS to reset the CMOS values to the default configuration (the memory connector or bank of connectors enabled).</p> 2. Replace the following components one at a time, in the order shown, restarting the computer each time: <ol style="list-style-type: none"> a. Monitor b. Video adapter (if one is installed) c. (Trained service technician only) System board
Only the cursor appears.	See "Solving undetermined problems" in the <i>Problem Determination and Service Guide</i> .
The monitor works when you turn on the computer, but the screen goes blank when you start some application programs.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • 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 applications. 2. Replace the monitor.
The monitor has screen jitters, or the screen image is wavy, unreadable, rolling, distorted.	<ol style="list-style-type: none"> 1. If the monitor self-tests show that the monitor is working properly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. <p>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.</p> <p>Notes:</p> <ol style="list-style-type: none"> 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. Replace the following components one at a time, in the order shown, restarting the computer each time: <ol style="list-style-type: none"> a. Video adapter (if one is installed) b. (Trained service technician only) System board

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide 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
Wrong characters appear on the screen.	<ol style="list-style-type: none"> 1. If the wrong language is displayed, update the BIOS code with the correct language. 2. Replace the following components one at a time, in the order shown, restarting the computer each time: <ol style="list-style-type: none"> a. Video adapter (if one is installed) b. (Trained service technician only) System board

Optional-device problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide 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.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The device is designed for the computer (see the ServerProven® list at http://www.ibm.com/server/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 device 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.	<ol style="list-style-type: none"> 1. Make sure that all of the option 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. If the failing device is a SCSI device, make sure that: <ul style="list-style-type: none"> • The cables for all external SCSI options are connected correctly. • The last device in each SCSI chain, or the end of the SCSI cable, is terminated correctly. • Any external SCSI device is turned on. You must turn on an external SCSI device before turning on the computer. 4. Reseat the failing device. 5. Replace the failing device.

Power problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician. 	
Symptom	Action
The power-control button does not work, and the reset button, if supported, does work.	<ol style="list-style-type: none"> 1. Reseat the following components: <ol style="list-style-type: none"> a. Control panel assembly b. (Trained service technician only) System board 2. Replace the following components one at a time, in the order shown, restarting the computer each time: <ol style="list-style-type: none"> a. (Trained service technician only) Control panel assembly b. (Trained service technician only) System board
The computer does not start.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The power cords are correctly connected to the computer and to a working electrical outlet. • The type of memory that is installed is correct. 2. If you just installed an optional device, remove it, and restart the computer. If the computer now starts, you might have installed more devices than the power supply supports. 3. Override the front panel power control button: <ol style="list-style-type: none"> a. Disconnect the computer power cords. b. Reconnect the power cords. <p>If the computer does not start, (trained service technician only) replace the system board.</p> 4. See "Solving undetermined problems" in the <i>Problem Determination and Service Guide</i>.
The computer does not turn off.	<ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> a. Press Ctrl+Alt+Delete. b. Turn off the computer by pressing the power-control button for 4 seconds. c. If computer fails POST and the power-control button does not work, disconnect the AC power cord. 2. If the problem remains or if you are using an ACPI-aware operating system, the problem could be with the system board.

Printer problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide 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 printer does not work.	<p>Make sure that:</p> <ul style="list-style-type: none"> • The printer is turned on and is online. • The printer signal cable is connected to the correct serial or parallel connector on the computer. <p>Note: Non-IBM printer cables might cause unpredictable results.</p> <ul style="list-style-type: none"> • You have assigned the printer port correctly in your operating system or application program. • You have assigned the printer port correctly in the Configuration/Setup Utility program. • You have run the tests that are described in the documentation that comes with the printer.

Serial port problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide 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.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • Each port is assigned a unique address in the Configuration/Setup Utility program and none of the serial ports are disabled. • The serial port adapter (if one is present) is seated correctly. 2. Replace the failing serial port adapter.
A serial device does not work.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The device is compatible with the computer. • The serial port is enabled and is assigned a unique address. • The device is connected to the correct connector (see the <i>User's Guide</i>). 2. Reseat the following components: <ol style="list-style-type: none"> a. Failing serial device b. (Trained service technician only) System board 3. Replace the following components one at a time, in the order shown, restarting the computer each time: <ol style="list-style-type: none"> a. Failing serial device b. (Trained service technician only) System board

Software problems

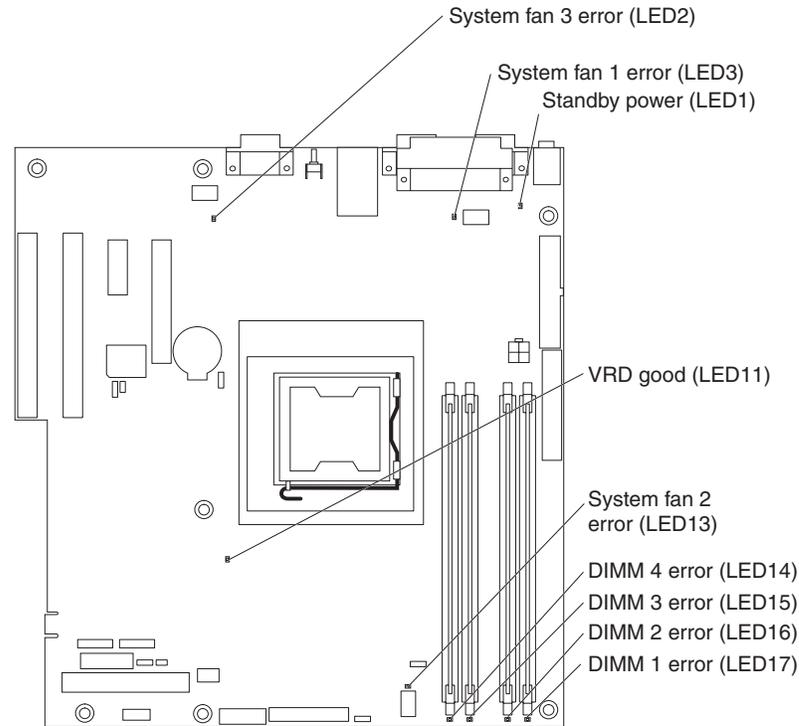
<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide to determine which components are customer replaceable units (CRU) and which components 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 suspected software problem occurred.	<ol style="list-style-type: none"> 1. To determine whether the problem is caused by the software, make sure that: <ul style="list-style-type: none"> • The computer has the minimum memory 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, you might have a memory-address conflict. • The software is designed to operate on the computer. • Other software works on the computer. • The software works on another computer. 2. If you received any error messages when using the software program, see the information that comes with the software for a description of the messages and suggested solutions to the problem. 3. Contact the place where you purchased the software.

Universal Serial Bus (USB) port problems

<ul style="list-style-type: none"> • Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. • See the parts listing in Problem Determination and Service Guide to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by (Trained service technician only), that step must be performed only by a trained service technician. 	
Symptom	Action
A USB device does not work.	<ol style="list-style-type: none"> 1. Run the USB diagnostics (see “Starting the diagnostic programs and viewing the test log” in the <i>Problem Determination and Service Guide</i>). 2. Make sure that: <ul style="list-style-type: none"> • The correct USB device driver is installed. • The operating system supports USB devices. 3. Make sure that the USB configuration options are set correctly in the Configuration/Setup Utility program menu (see the <i>User’s Guide</i> for more information).

System-board error LEDs

The following illustration shows the LEDs on the system board. You might have to refer to this illustration when solving problems with the server.

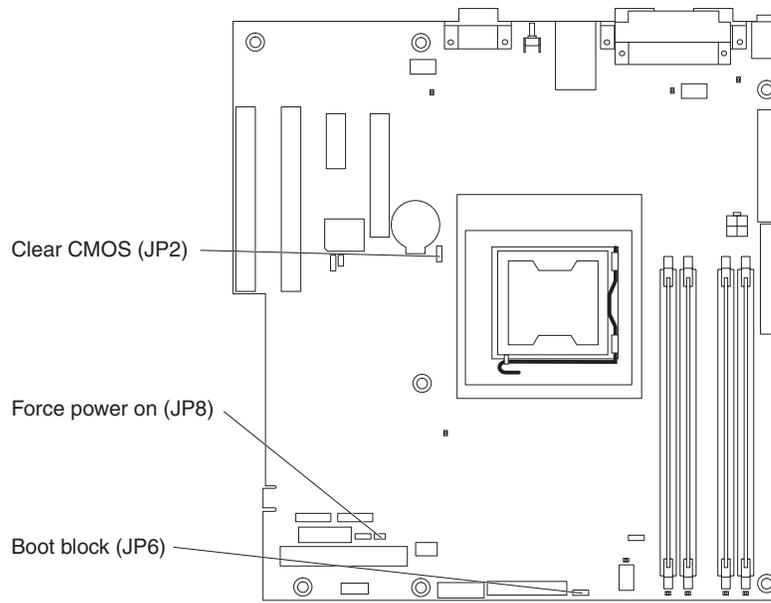


Each error LED is lit to indicate a problem with a specific component. After a problem is corrected, its LED will not be lit the next time the server is restarted; if the problem remains, the LED will be lit again. See the *Problem Determination and Service Guide* on the IBM xSeries Documentation CD for additional information.

Recovering from a BIOS update failure

If power to the server is interrupted while BIOS code is being updated (flash update), the server might not restart (reboot) correctly. If this happens, complete the following steps to recover:

1. Review the safety information that begins on page v and “Handling static-sensitive devices” on page 8
2. Turn off the computer and all attached devices.
3. Disconnect the power cord.
4. Remove the side cover (see “Removing the side cover” on page 9).
5. Locate the boot block recovery jumper (JP6) on the system board, removing any adapters that impede access to the jumper. The following illustration shows the location of the jumper on the system board.



6. Remove the boot block recovery jumper from pins 1 and 2.
7. Replace any adapters that were removed; then, replace the side cover (see “Installing the side cover” on page 25).
8. Connect the server to a power source, keyboard, monitor, and mouse.
9. Insert the BIOS update (flash) diskette into the diskette drive. You can download a file to create this diskette from <http://www.ibm.com/support/>.
10. Turn on the computer and the monitor.
11. After the update is completed, turn off the server and monitor.
12. Remove the diskette from the diskette drive.
13. Disconnect all power cords; then, remove the server cover.
14. Return the boot block recovery jumper to pins 1 and 2.
15. Reinstall the server cover; then, reconnect all external cables and power cords and turn on the peripheral devices.
16. Turn on the server to restart the operating system.

Appendix A. Getting help and technical assistance

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

Before you call

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the IBM xSeries Documentation CD or at the IBM Support Web site.
- 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 publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

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

Getting help and information from the World Wide Web

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

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

Software service and support

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

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

Hardware service and support

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

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

Appendix B. Notices

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EtherJet	Tivoli
e-business logo	Tivoli Enterprise
@server	Update Connector
FlashCopy	Wake on LAN
IBM	XA-32
IntelliStation	XA-64
NetBAY	X-Architecture
Netfinity	Xcel4
NetView	XpandOnDemand
OS/2 WARP	xSeries
Predictive Failure Analysis	

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Important notes

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

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

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

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

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

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

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

Product recycling and disposal

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



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

This appliance is labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as

applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

この機器には、EU 諸国に対する廃電気電子機器指令 2002/96/EC(WEEE) のラベルが貼られています。この指令は、EU 諸国に適用する使用済み機器の回収とリサイクルの骨子を定めています。このラベルは、使用済みになった時に指令に従って適正な処理をする必要があることを知らせるために種々の製品に貼られています。

Remarque : Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

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

In the Netherlands, the following applies.



For Taiwan: Please recycle batteries.



Electronic emission notices

IBM @server xSeries 100 Type 8486

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

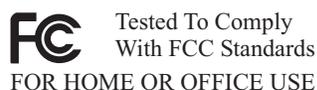
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- 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



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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取扱説明書に従って正しい取り扱いをして下さい。

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, Maceo, 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

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