



# System x3200 M2 Types 4367 and 4368 Installation Guide

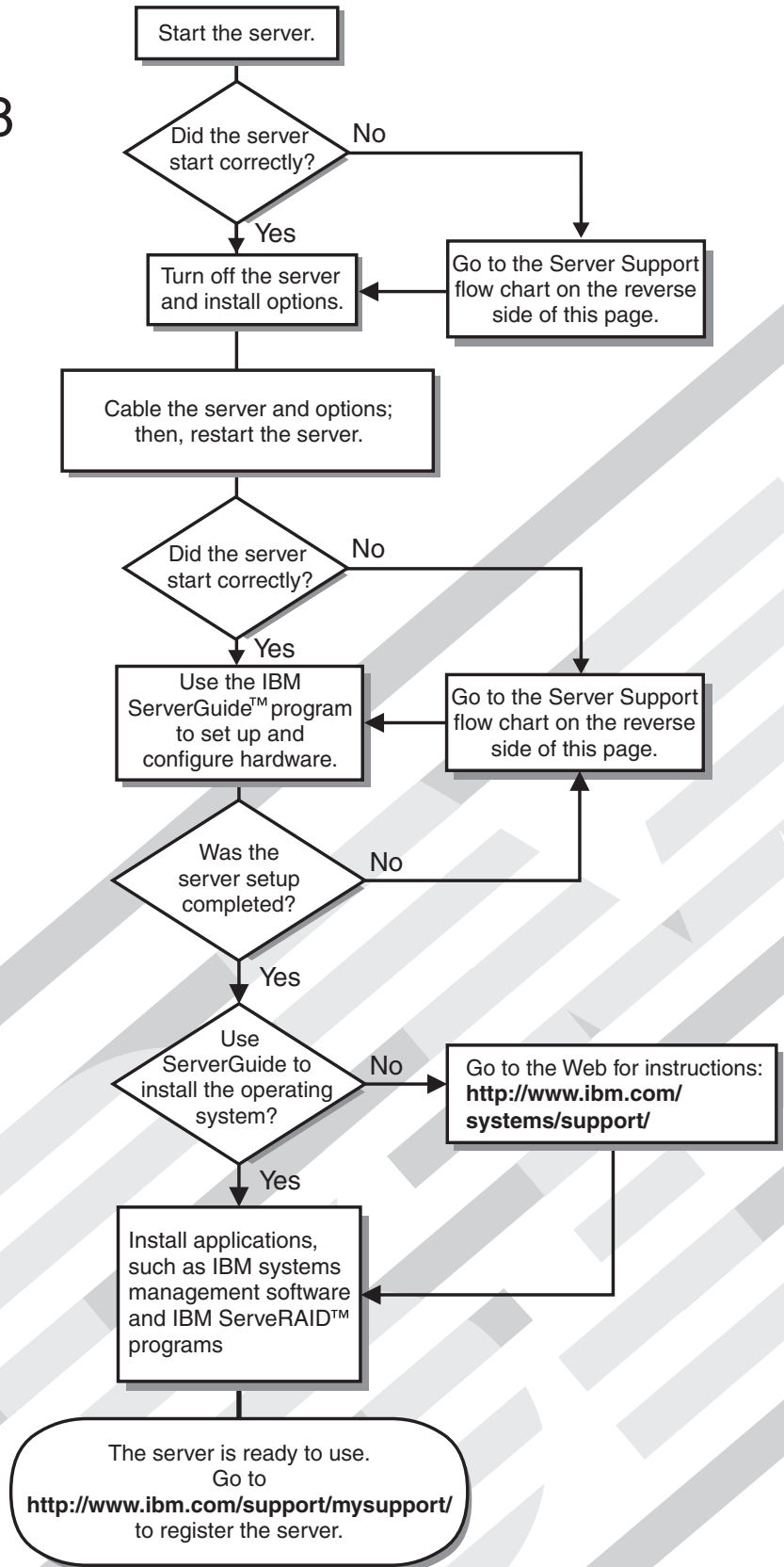
## Welcome.

Thank you for buying an IBM server.

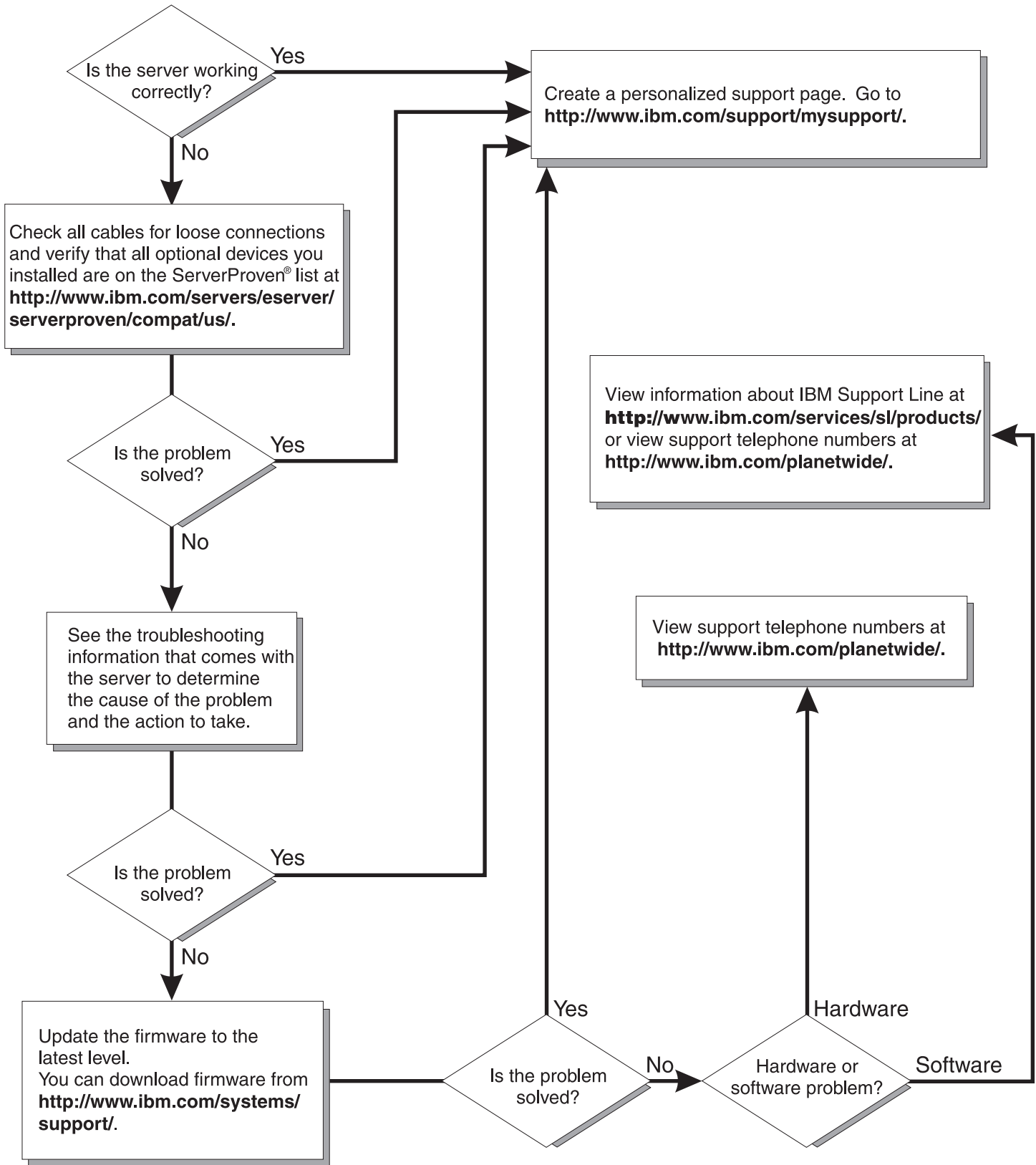
This server *Installation Guide* contains information for setting up and configuring your server.

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/systems/x/>.



# Server Support





System x3200 M2 Types 4367 and 4368  
Installation Guide

**Note:**

Before using this information and the product it supports, read the general information in Appendix B, "Notices," on page 75, and the *Warranty and Support Information* document on the IBM System x Documentation CD.

**Third Edition (September 2009)**

**© Copyright International Business Machines Corporation 2009.**

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

---

# Contents

<b>Safety</b> . . . . .	v
<b>Chapter 1. Introduction</b> . . . . .	1
The IBM System x Documentation CD . . . . .	4
Hardware and software requirements . . . . .	4
Using the Documentation Browser . . . . .	4
Notices and statements in this document . . . . .	5
Features and specifications . . . . .	6
Major components of the server . . . . .	8
<b>Chapter 2. Installing optional devices</b> . . . . .	9
Installation guidelines . . . . .	9
System reliability guidelines . . . . .	10
Working inside the server with the power on . . . . .	10
Handling static-sensitive devices . . . . .	11
Removing the side cover . . . . .	12
Removing the two-piece bezel . . . . .	13
Installing a memory module . . . . .	15
Installing a drive . . . . .	19
Installing a CD or DVD drive . . . . .	20
Installing a tape drive . . . . .	22
Installing a hot-swap SAS or hot-swap SATA hard disk drive . . . . .	23
IDs for hot-swap hard disk drives . . . . .	25
Installing a simple-swap SATA hard disk drive . . . . .	26
Power and signal cables for internal drives . . . . .	28
Installing an adapter . . . . .	28
Completing the installation . . . . .	32
Reinstalling the two-piece bezel . . . . .	32
Reinstalling the side cover . . . . .	34
Connecting the cables . . . . .	35
Updating the server configuration . . . . .	36
<b>Chapter 3. Server controls, LEDs, and power.</b> . . . . .	37
Front view . . . . .	37
Rear view . . . . .	39
Server power features . . . . .	40
Turning on the server . . . . .	40
Turning off the server . . . . .	40
<b>Chapter 4. Configuring the server</b> . . . . .	43
Using the ServerGuide Setup and Installation CD . . . . .	43
Using the Configuration/Setup Utility program . . . . .	44
Using the Boot Menu program . . . . .	44
Enabling the Broadcom NetXtreme Gigabit Ethernet Boot Agent . . . . .	44
Configuring the Broadcom NetXtreme Gigabit Ethernet controller . . . . .	45
LSI Configuration Utility program . . . . .	45
<b>Chapter 5. Solving problems</b> . . . . .	47
Diagnostic tools overview . . . . .	47
POST beep codes . . . . .	47
POST error codes . . . . .	48
Troubleshooting tables . . . . .	58
CD or DVD drive problems . . . . .	59

Diskette drive problems . . . . .	60
General problems . . . . .	60
Hard disk drive problems . . . . .	60
Intermittent problems. . . . .	61
Keyboard, mouse, or pointing-device problems . . . . .	62
Memory problems . . . . .	63
Microprocessor problems . . . . .	64
Monitor problems . . . . .	64
Optional-device problems . . . . .	67
Power problems . . . . .	68
Serial-device problems . . . . .	69
ServerGuide problems . . . . .	69
Software problems . . . . .	70
Universal Serial Bus (USB) device problems . . . . .	71
System-board LEDs . . . . .	71
<b>Appendix A. Getting help and technical assistance . . . . .</b>	<b>73</b>
Before you call . . . . .	73
Using the documentation . . . . .	73
Getting help and information from the World Wide Web . . . . .	73
Software service and support . . . . .	74
Hardware service and support . . . . .	74
IBM Taiwan product service . . . . .	74
<b>Appendix B. Notices . . . . .</b>	<b>75</b>
Trademarks . . . . .	75
Important notes. . . . .	76
Particulate contamination . . . . .	77
Documentation format . . . . .	78
Electronic emission notices . . . . .	78
Federal Communications Commission (FCC) statement . . . . .	78
Industry Canada Class A emission compliance statement . . . . .	79
Avis de conformité à la réglementation d'Industrie Canada . . . . .	79
Australia and New Zealand Class A statement . . . . .	79
United Kingdom telecommunications safety requirement. . . . .	79
European Union EMC Directive conformance statement. . . . .	79
Taiwanese Class A warning statement . . . . .	80
Germany Electromagnetic Compatibility Directive . . . . .	80
People's Republic of China Class A warning statement . . . . .	81
Japanese Voluntary Control Council for Interference (VCCI) statement . . . . .	81
Korean Class A warning statement . . . . .	81
<b>Index . . . . .</b>	<b>83</b>

## Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

**Important:**

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

For example, if a caution statement is labeled “Statement 1,” translations for that caution statement are in the *IBM Safety Information* document under “Statement 1.”

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



Statement 1:



**DANGER**

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

**To avoid a shock hazard:**

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

**To Connect:**

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.



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

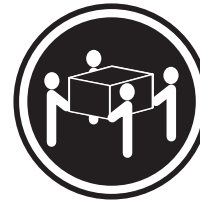
**Statement 4:**



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

**CAUTION:**

**Use safe practices when lifting.**

**Statement 5:**



**CAUTION:**

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



**Statement 8:**



**CAUTION:**

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



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

**Statement 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.**

# Chapter 1. Introduction

This *Installation Guide* contains instructions for setting up the IBM System x3200 M2 Machine Types 4367 and 4368 server and basic instructions for installing some optional devices. More detailed instructions for installing optional devices are in the *User's Guide* on the IBM System x<sup>®</sup> 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 optional devices
- Solving problems

If firmware and documentation updates are available, you can download them from the IBM Web site. The server might have features that are not described in the documentation that comes with the server, and 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. To check for updates, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. Procedures for locating firmware and documentation might vary slightly from what is described in this document.

1. Go to <http://www.ibm.com/systems/support/>.
2. Under Product support, click **System x**.
3. Under **Popular links**, click **Software and device drivers** for firmware updates, or click **Publications lookup** for documentation updates.

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.

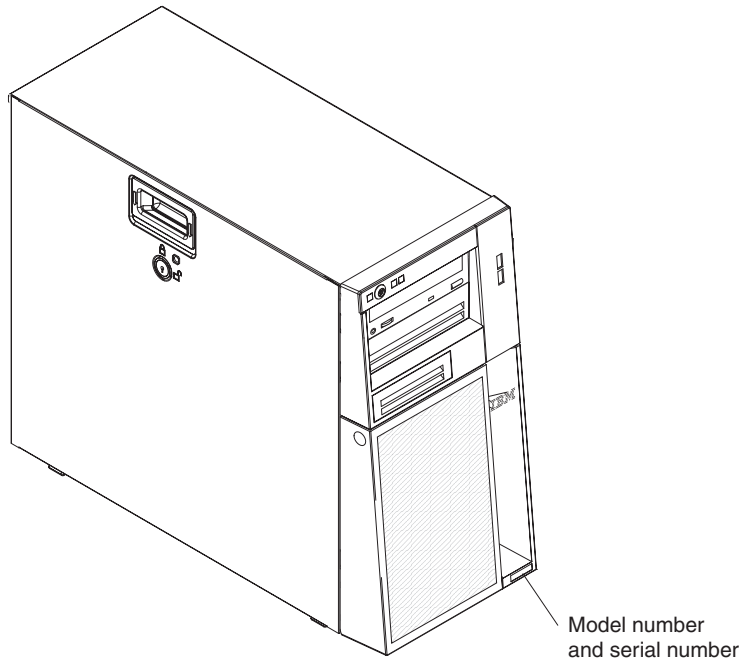
The server comes with a limited warranty. You can obtain up-to-date information about the server and other IBM server products at <http://www.ibm.com/systems/x/>.

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

<b>Product name</b>	IBM System x3200 M2
<b>Machine type</b>	4367 or 4368
<b>Model number</b>	_____
<b>Serial number</b>	_____
<b>Key serial number</b>	_____
<b>Key manufacturer</b>	_____
<b>Key phone number</b>	_____

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

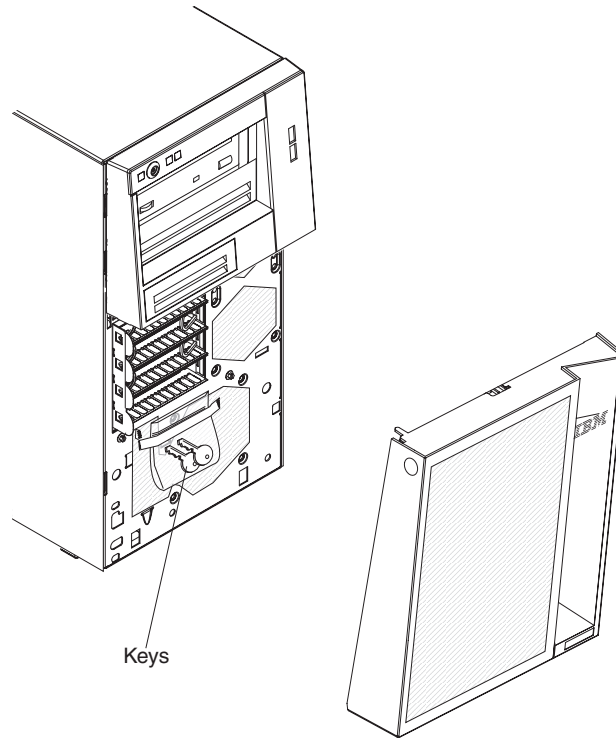
**Note:** This illustration shows a hot-swap model. A non-hot-swap hard disk drive model is also available.





**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.

The server keys are in a plastic bag and attached to the front of the server chassis behind the lower-bezel door. To access the keys, remove the lower-bezel. The following illustration shows the location on the server where you can find the keys:



If you plan to install the server in a rack, you must purchase a Tower-to-Rack Kit. For a list of supported optional devices for the server, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

---

## The IBM System x Documentation CD

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

### Hardware and software requirements

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

- Microsoft Windows XP, 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

### 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 CD or DVD drive and click **Start --> Run**. In the **Open** field, type

```
e:\win32.bat
```

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

- If you are using Red Hat Linux, insert the CD into the CD or DVD drive; then, run the following command from the /mnt/cdrom directory:

```
sh runlinux.sh
```

Select your server from the **Product** menu. The **Available Topics** list displays all the documents for your 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 is displayed 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 press 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 in this document are also in the multilingual *Safety Information* document, which is on the IBM *System x Documentation* CD. Each statement is numbered for reference to the corresponding statement in the *Safety Information* document.

The following notices and statements are used in this document:

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

---

## Features and specifications

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

Table 1. Features and specifications

<p><b>Microprocessor:</b></p> <ul style="list-style-type: none"> <li>Supports one Intel® Core™ 2 Duo dual-core or Xeon® dual-core or quad-core microprocessor</li> </ul> <p><b>Note:</b> Intel Virtualization Technology (VT) is not available on the Core 2 Duo E4600; however, these microprocessors can only run paravirtualization.</p> <ul style="list-style-type: none"> <li>2 MB, 6 MB, or 12 MB Level-2 cache</li> <li>800, 1066, or 1333 MHz front-side bus (FSB)</li> </ul> <p><b>Memory:</b></p> <ul style="list-style-type: none"> <li>Minimum: 512 MB</li> <li>Maximum: 8 GB</li> <li>Types: PC2-5300 or PC2-6400, ECC unbuffered double-data-rate 2 (DDR2) 667 or 800 MHz SDRAM</li> <li>Connectors: four dual inline memory module (DIMM) connectors, two-way interleaved</li> </ul> <p><b>Drives (depending on the model):</b></p> <ul style="list-style-type: none"> <li>Diskette (optional): External or internal USB FDD drive and memory key</li> <li>Hard disk drive: Hot-swap SAS, hot-swap SATA, or simple-swap SATA</li> <li>One of the following SATA attached optical drives: <ul style="list-style-type: none"> <li>DVD-ROM</li> <li>Multiburner (optional)</li> </ul> </li> </ul> <p><b>Drive bays (depending on the model):</b></p> <ul style="list-style-type: none"> <li>Two 5.25 in. half-high bays (one optical drive installed)</li> <li>One 3.5 in. slim-high removable-media drive bay (optional diskette drive)</li> <li>Four 3.5 in. or 2.5 in. slim-high hard disk drive bays (some models)</li> <li>Eight 2.5 in. slim-high hard disk drive bays (some models)</li> </ul> <p><b>PCI expansion slots (depending on the model):</b></p> <ul style="list-style-type: none"> <li>One PCI Express x8 slot</li> <li>One PCI Express x4 slot (x4 slot with x1 electrical)</li> <li>One PCI-X 64-bit/133 MHz slot</li> </ul> <p><b>Note:</b> This PCI-X slot is enabled when an optional PCI-X enablement card is installed in the mini-PCI slot on the system board. When no mini-PCI-X enablement card installed, this slot has no function.</p> <ul style="list-style-type: none"> <li>Two PCI 32-bit/33 MHz slots</li> </ul>	<p><b>Fans:</b></p> <p>Three speed-controlled fans.</p> <p><b>Power supply:</b></p> <p>One of the following power supplies:</p> <ul style="list-style-type: none"> <li>One or two redundant 430-watt (90-240 V ac)</li> <li>One non-redundant 401-watt (90-240 V ac)</li> </ul> <p><b>Size:</b></p> <ul style="list-style-type: none"> <li>Height: 438 mm (17.25 in.)</li> <li>Depth: 540 mm (21.25 in.)</li> <li>Width: 216 mm (8.5 in.)</li> <li>Weight: 16.3 kg (36 lb) to 25.2 kg (56 lb) depending upon configuration</li> </ul> <p><b>Integrated functions:</b></p> <ul style="list-style-type: none"> <li>Mini-baseboard management controller (mini-BMC)</li> <li>Broadcom BCM5722 10/100/1000 Ethernet controller on the system board with RJ-45 Ethernet port</li> <li>One internal single-channel (four ports per channel) SAS/SATA controller (mini-PCI slot)</li> <li>Two serial ports</li> <li>One parallel port</li> <li>Six-port Serial ATA controller</li> <li>Eight Universal Serial Bus (USB) v2.0 ports (two on front and four on rear, one internal for optional tape drive, and one internal for optional Remote Supervisor Adapter II SlimLine)</li> <li>Onboard ATI ES1000 video controller <ul style="list-style-type: none"> <li>Compatible with SVGA and VGA</li> <li>64 MB DDR2 SDRAM video memory</li> </ul> </li> </ul> <p><b>Diagnostic LEDs:</b></p> <ul style="list-style-type: none"> <li>Fans</li> <li>Hard disk drives</li> <li>Memory</li> <li>Microprocessor</li> <li>PCI slots</li> <li>Power supply</li> <li>VRD</li> </ul> <p><b>Acoustical noise emissions:</b></p> <ul style="list-style-type: none"> <li>Sound power, idling: 5.0 bel</li> <li>Sound power, operating: 5.3 bel</li> </ul>	<p><b>Environment:</b></p> <ul style="list-style-type: none"> <li>Air temperature: <ul style="list-style-type: none"> <li>Server on: 10° to 35°C (50° to 95°F)</li> <li>Altitude: 0 to 914.4 m (3000 ft)</li> <li>Server on: 10° to 32°C (50° to 89.6°F)</li> <li>Altitude: 914.4 m (3000 ft) to 2133.6 m (7000 ft)</li> <li>Server off: 10° to 43°C (50° to 109.4°F)</li> <li>Maximum altitude: 2133.6 m (7000 ft)</li> <li>Shipping: -40° to 60°C (-40° to 140°F)</li> </ul> </li> <li>Humidity (operating and storage): <ul style="list-style-type: none"> <li>Server on: 8% to 80%</li> <li>Server off: 8% to 80%</li> </ul> </li> <li>Particulate contamination: <p><b>Attention:</b> Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server. For information about the limits for particulates and gases, see “Particulate contamination” on page 77.</p> </li> </ul> <p><b>Heat output:</b></p> <p>Approximate heat output in British thermal units (Btu) per hour:</p> <ul style="list-style-type: none"> <li>Minimum configuration: 630 Btu per hour (185 watts)</li> <li>Maximum configuration: 1784 Btu per hour (523 watts)</li> </ul> <p><b>Electrical input:</b></p> <ul style="list-style-type: none"> <li>Sine-wave input (50 or 60 Hz) required</li> <li>Input voltage and frequency ranges automatically selected</li> <li>Input voltage low range: <ul style="list-style-type: none"> <li>Minimum: 100 V ac</li> <li>Maximum: 127 V ac</li> </ul> </li> <li>Input voltage high range: <ul style="list-style-type: none"> <li>Minimum: 200 V ac</li> <li>Maximum: 240 V ac</li> </ul> </li> <li>Input kilovolt-amperes (kVA) approximately: <ul style="list-style-type: none"> <li>Minimum: 0.20 kVA (all models)</li> <li>Maximum: 0.55 kVA</li> </ul> </li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>Power consumption and heat output vary depending on the number and type of optional features that are installed and the power-management optional features that are in use.</li> <li>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 stated values because of room reflections and other nearby noise sources. The declared sound-power levels indicate an upper limit, below which a large number of computers will operate.</li> </ol>
--	---	---

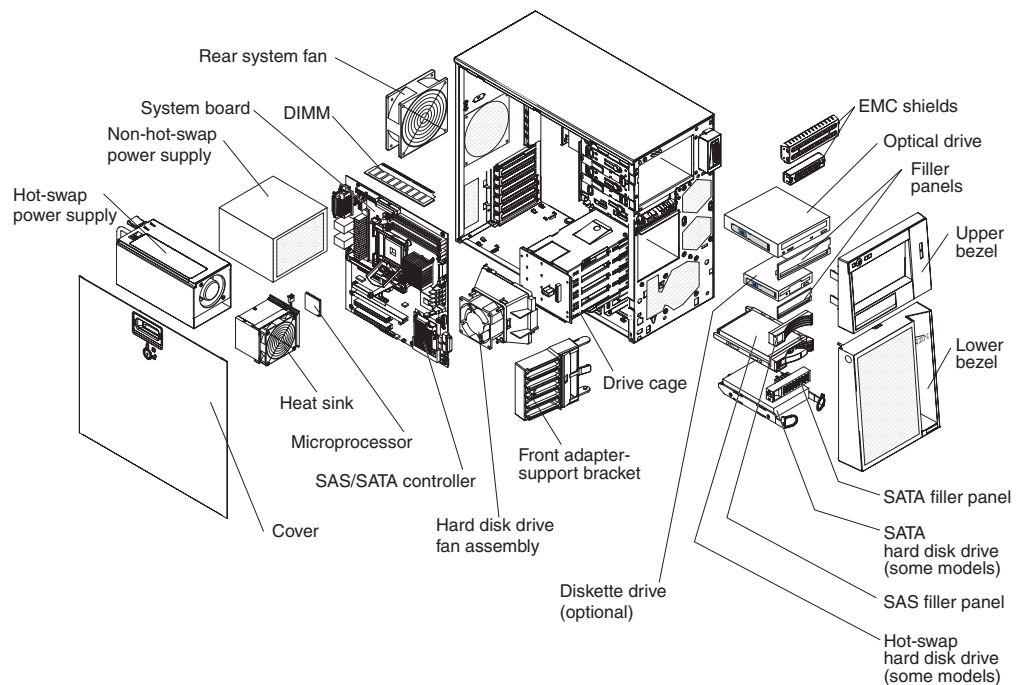
## Major components of the server

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.

Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.

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 optional devices

This chapter provides basic instructions for installing optional hardware devices 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 System x Documentation CD*.

---

### Installation guidelines

Before you install optional devices, read the following information:

- Read the safety information that begins on page v, the guidelines in “Working inside the server with the power on” on page 10, and “Handling static-sensitive devices” on page 11. 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.
- When you install your new server, take the opportunity to download and apply the most recent firmware updates. This step will help to ensure that any known issues are addressed and that your server is ready to function at maximum levels of performance. To download firmware updates for your server, complete the following steps.

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

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Software and device drivers**.
4. Click **IBM System x3200 M2** to display the matrix of downloadable files for the server.

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

- Before you install optional hardware devices, make sure that the server is working correctly. Start the server, and make sure that the operating system starts, if an operating system is installed, or that a 19990305 error code is displayed, indicating that an operating system was not found but the server is otherwise working correctly. If the server is not working correctly, see *Solving problems* for diagnostic information.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- If you must start the server while the cover is removed, make sure that no one is near the server and that no tools or other objects have been left inside the server.
- Do not attempt to lift an object that you think is too heavy for you. If you have to lift a heavy object, observe the following precautions:
  - Make sure that you can stand safely without slipping.
  - Distribute the weight of the object equally between your feet.
  - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
  - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.

- Make sure that you have an adequate number of properly grounded electrical outlets for the server, monitor, and other devices.
- Back up all important data before you make changes to disk drives.
- Have a small flat-blade screwdriver available.
- You do not have to turn off the server to install or replace hot-swap power supplies or hot-plug Universal Serial Bus (USB) devices. However, you must turn off the server before you perform any steps that involve removing or installing adapter cables.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the server, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on 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 have to access the inside of the server, you might find it easier to lay the server on its side.
- When you are finished working on the server, reinstall all safety shields, guards, labels, and ground wires.
- For a list of supported optional devices for the server, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

## System reliability guidelines

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

- If the server has redundant power, each of the power-supply bays has a power supply installed in it.
- There is adequate space around the server to allow the server cooling system to work properly. Leave approximately 50 mm (2 in.) of open space around the front and rear of the server. Do not place objects in front of the fans. For proper cooling and airflow, replace the server cover before you turn on the server. Operating the server for extended periods of time (more than 30 minutes) with the server cover removed might damage server components.

When you install the server in a rack, make sure that space is available around the server to enable the server cooling system to work properly. See the documentation that comes with the rack for additional information.

- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan within 48 hours.
- You have replaced a hot-swap drive within 2 minutes of removal.

## Working inside the server with the power on

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



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

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

## Handling static-sensitive devices

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

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

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

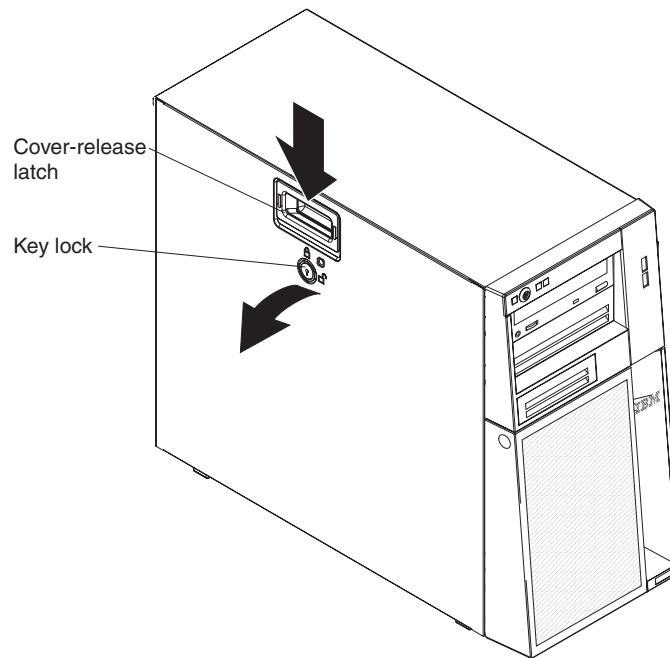
---

## Removing the side cover

**Important:** Before you install optional hardware devices, make sure that the server is working correctly. Start the server, and make sure that the operating system starts, if an operating system is installed, or that a 19990305 error code is displayed, indicating that an operating system was not found but the server is otherwise working correctly. If the server is not working correctly, see [Solving problems](#) for diagnostic information.

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

1. Review the safety information that begins on page v and the “Installation guidelines” on page 9.
2. Turn off the server and all attached devices (see “Turning off the server” on page 40); then, disconnect all power cords and external cables.
3. Lay the server on its side.
4. Unlock the side cover; then, press the cover-release latch down, as indicated by the two arrows on the latch.



5. Lift the side cover off the server and set it aside.

To replace the side cover, see “Reinstalling the side cover” on page 34.

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

---

## Removing the two-piece bezel

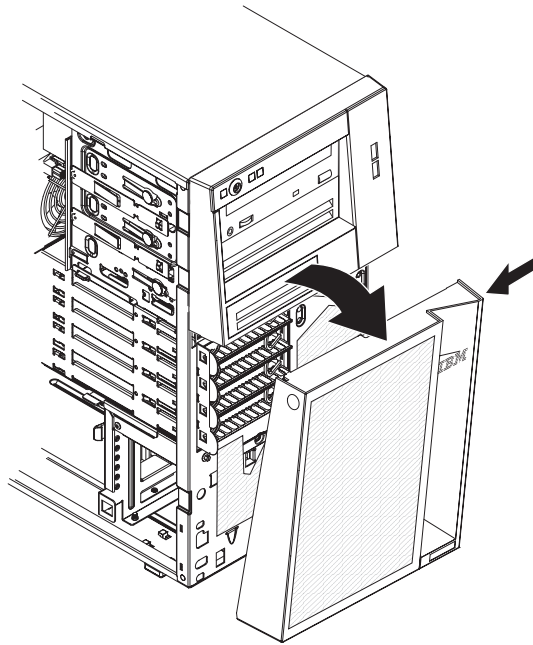
When you work with some devices, such as drives in bays 1 through 7 (or bays 1 through 11 if you have the 2.5-inch eight-drive model, see page Table 6 on page 19), you must first remove the two-piece bezel to access the devices.

### Notes:

- Before you remove the upper bezel, you must unlock and remove the side cover and remove the lower bezel.
- If you are removing only the lower bezel, you do not have to remove the side cover. However, the side cover must be unlocked.

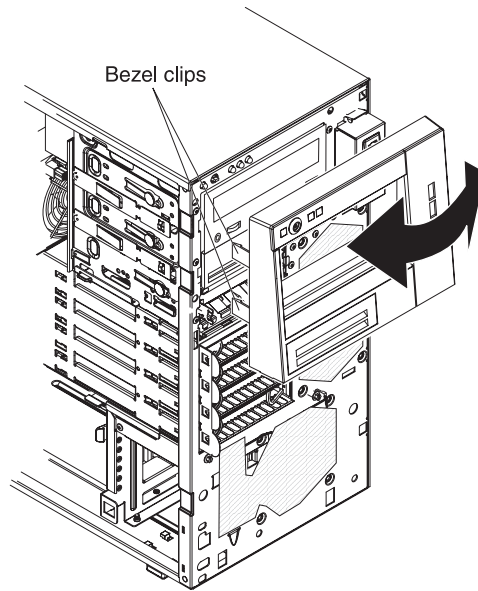
To remove the two-piece bezel, complete the following steps:

1. Unlock the side cover.
2. Remove the side cover (see “Removing the side cover” on page 12).
3. Press the round blue release button on the right side of the lower bezel and tilt the lower bezel forward to disengage it from the chassis.



4. Lift the lower bezel to disengage the two bottom tabs from the chassis. Set the lower bezel aside.

5. Carefully pull the two bezel clips on the left side of the upper bezel away from the chassis; then, rotate the upper bezel to the right side of the server to disengage the two right-side tabs from the chassis. Set the upper bezel aside.



For instructions for reinstalling the two-piece bezel, see “Reinstalling the two-piece bezel” on page 32.

## 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 you install DIMMs:

- The server supports only industry-standard, 1.8 V, 240-pin, double-data-rate 2 (DDR2), 667 or 800 MHz, PC2-5300 or PC2-6400, unbuffered, synchronous dynamic random-access memory (SDRAM) dual inline memory modules (DIMMs) with error correcting code (ECC). These DIMMs must be compatible with the latest DDR2 667 or 800 MHz SDRAM unbuffered DIMM specification. For a list of supported optional devices for the server, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.
- The optional DIMM that are available for the server are 512 MB, 1 GB, and 2 GB. The server supports a minimum of 512 MB and a maximum of 8 GB of system memory.
- Some servers come with one 512 MB DIMM, two 512 MB DIMMs, or two 1 GB DIMMs installed.

Depending on the DIMM sizes installed in your server, the server can support one, two, or four DIMMs. The 512 MB DIMM option kit contains one DIMM; however, the 1 GB DIMM and 2 GB option kits each contain two DIMMs.

- The system board contains four DIMM connectors and supports two-way memory interleaving. For two-way memory interleaving, DIMMs must be installed in matched pairs.

If one DIMM is installed in the DIMM 1 connector, 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 use compatible DIMMs from various manufacturers.

If you install a second pair of DIMMs in the DIMM 2 and DIMM 4 connectors, they do not have to be the same size, speed, type, and technology as the DIMMs in the DIMM 1 and DIMM 3 connectors. However, the size, speed, type, and technology of the DIMMs that you install in the DIMM 2 and DIMM 4 connectors must match each other.

- The maximum operating speed of the server is determined by the slowest DIMM in the server.
- The server can operate in single-channel mode or dual-channel mode.
- DIMM population is based on single-rank, double-rank, or combined single-rank and double-rank DIMMs. DIMMs must be installed in order, starting with the DIMM connector that is farthest from the memory controller hub. Double-rank DIMMs must be installed in the DIMM connector that is farthest from the memory controller hub when you install a combination of single-rank and double-rank DIMMs. The following tables show examples of populating the server with different combinations of single-rank and double-rank DIMMs and different operating modes.

Table 2. Single-channel mode with single-rank and double-rank DIMMs

Channel 0		Channel 1	
DIMM 1	DIMM 2	DIMM 3	DIMM 4
Single-rank			
Double-rank			
Single-rank	Single-rank		

Table 3. Dual-channel mode with single-rank and double-rank DIMMs

First pair		Second pair		Remarks
DIMM 1	DIMM 2	DIMM 3	DIMM 4	
Single-rank	Single-rank	Single-rank	Single-rank	
Single-rank	Single-rank	Double-rank	Double-rank	This configuration is the second-best choice.
Double-rank	Double-rank	Single-rank	Single-rank	This configuration is the best choice.
Double-rank	Double-rank	Double-rank	Double-rank	

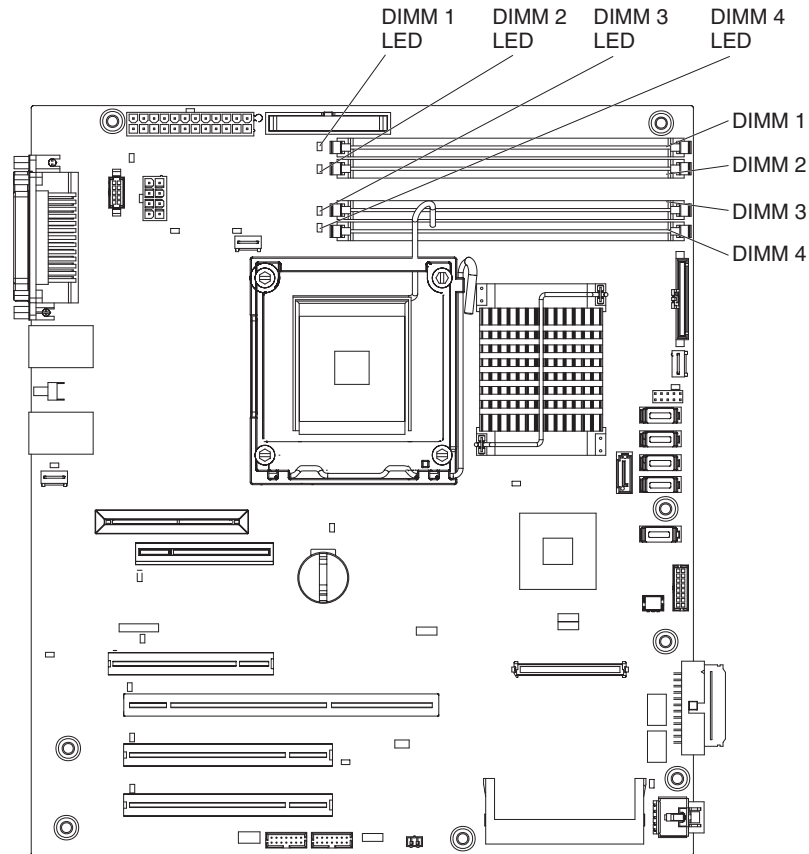
The following table shows the sequence in which DIMMs must be installed in the server.

Table 4. DIMM installation sequence

Number of DIMMs	Installation sequence (connectors)
1	1
2 (interleaved configuration)	1, 3
3	The use of three DIMMs is not supported
4 (interleaved configuration)	1, 3, 2, 4

- The amount of usable memory will be reduced depending on the system configuration. A certain amount of memory must be reserved for system resources. To view the total amount of installed memory and the amount of configured memory, run the Configuration/Setup Utility program and select **System Summary** from the menu. For additional information, see the *User's Guide* on the IBM System x Documentation CD.
- When you restart the server after you add or remove a DIMM, the server displays a message that the memory configuration has changed.

The following illustration shows the dual inline memory module (DIMM) connectors and corresponding LEDs on the system board.



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

To install a DIMM, complete the following steps:

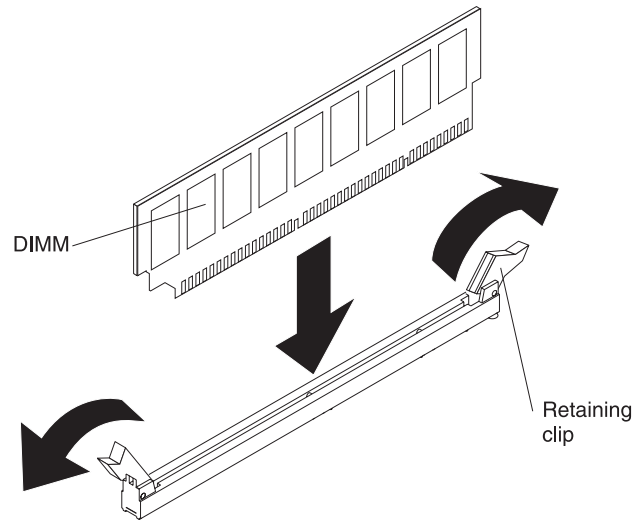
1. Read the safety information that begins on page v and “Installation guidelines” on page 9.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables.
3. Remove the side cover (see “Removing the side cover” on page 12).
4. Locate the DIMM connectors on the system board. Determine the connectors into which you will install the DIMMs. Install the DIMMs in the sequence shown in the following table.

Table 5. DIMM installation sequence

Number of DIMMs	Installation sequence (connectors)
1	1
2 (interleaved configuration)	1, 3
3	The use of three DIMMs is not supported
4 (interleaved configuration)	1, 3, 2, 4

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

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



6. 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.
7. Turn the DIMM so that the DIMM keys align correctly with the slot.
8. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector. 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 devices to install or remove, do so now; otherwise, go to “Completing the installation” on page 32.

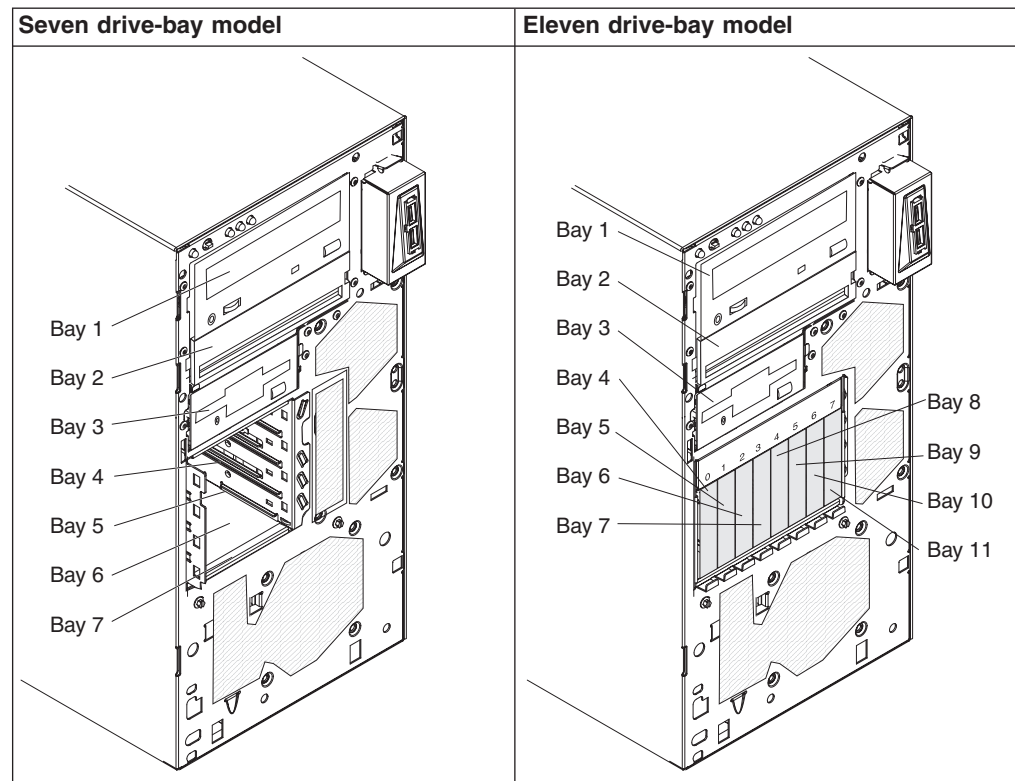


## Installing a drive

Depending on the server model, a DVD-ROM or multiburner drive might be installed in the server. The server supports 2.5-inch and 3.5-inch hot-swap SAS or hot-swap SATA hard disk drives and 3.5-inch simple-swap SATA hard disk drives (depending on the model).

The following illustrations show the locations of the drive bays. Some models come with 7 drive bays, and some models have 11 drive bays.

Table 6. Drive bays on the server models



The following notes describe the types of drives that the server supports and other information that you must consider when you install a drive:

- Make sure that you have all the cables and other equipment specified that are in the documentation that comes with the drive.
- Select the bay in which you want to install the drive.
- Check the instructions that come with the drive to determine whether you have to set any switches or jumpers on the drive. If you are installing a SAS or SATA device, be sure to set the SAS or SATA ID for that device.
- Optional internal or external USB diskette drives, tape drives, DVD-ROM, and multiburner drives are examples of removable-media drives. You can install removable-media drives in bays 1, 2, and 3 only.
- The SATA removable-media drives that you install in bay 1 connects to the SATA 4 connector on the system board and the drive in bay 2 connects to the SATA 5 connector on the system board.
- To install a 3.5-inch drive in a 5.25-inch bay, you must use the 5.25-inch conversion kit.

- The electromagnetic interference (EMI) integrity and cooling of the server are protected by having all bays, and PCI and PCI Express slots covered or occupied. When you install a drive, PCI, or PCI Express adapter, save the EMC shield and filler panel from the bay or the PCI or PCI Express adapter slot cover in the event that you later remove the device.
- For a complete list of supported optional devices for the server, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

## Installing a CD or DVD drive

To install a CD or DVD drive, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 9.
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 12).
4. Remove the two-piece bezel (see “Removing the two-piece bezel” on page 13).
5. Use a screwdriver to pry the filler panel and EMC shield away from the server.

**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.

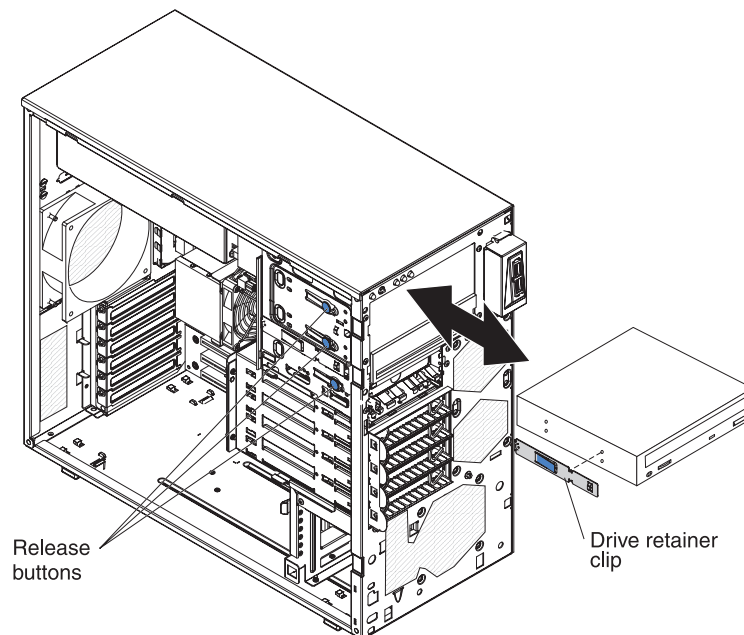


Class 1 Laser Product  
Laser Klasse 1  
Laser Class 1  
Luokan 1 Laserlaite  
Appareil À Laser de Classe 1

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.

**Note:** You might find it easier to install the new drive from the front and then attach the cables.

8. Remove the drive retainer clip from the side of the drive cage of bays 1 or 2. Slide the drive retainer clip to the right to remove it from the drive cage; then, snap the drive retainer clip into the screw holes on the side of the drive.



9. If you are installing a 5.25-inch drive in bay 2, slide the drive into the bay. If you are installing a 3.5-inch drive in bay 2, you must attach the 5.25-inch conversion kit to the 3.5-inch drive.

**Note:** An optional external diskette drive can only be installed in bay 3.

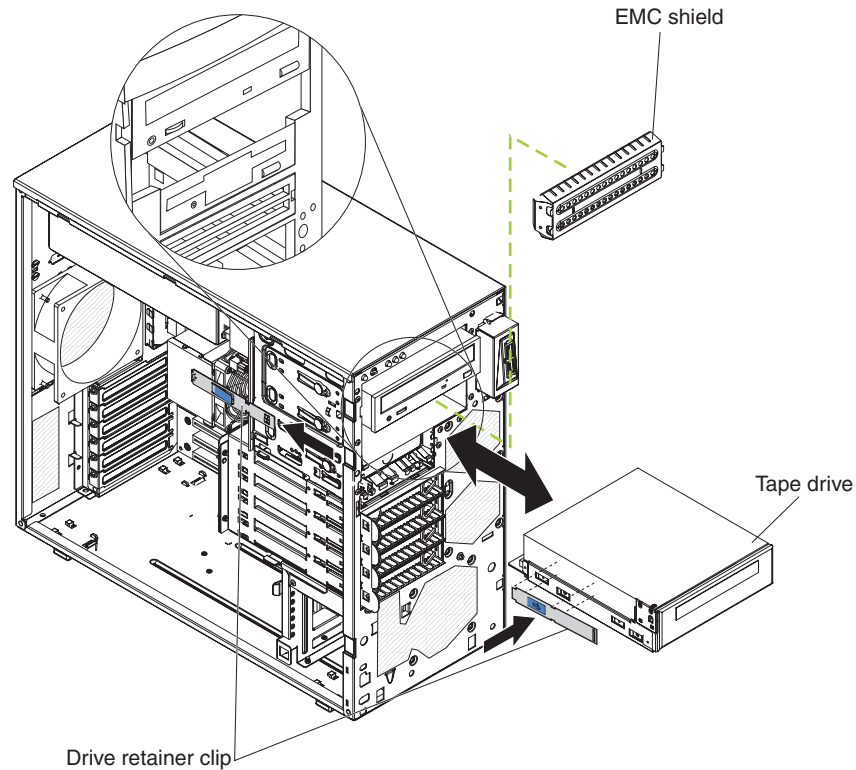
10. Connect one end of the applicable signal cable into the rear of the drive and make sure that the other end of this cable is connected into the applicable SATA connector on the system board.
11. Route the signal cable so that it does not block the airflow to the rear of the drives or over the microprocessor and dual inline memory modules (DIMMs).
12. If you have another drive to install or remove, do so now.
13. Connect the power cable to the rear of the drive. The connectors are keyed and can be inserted only one way.

If you have other devices to install or remove, do so now; otherwise, go to “Completing the installation” on page 32.

## Installing a tape drive

To install a tape drive, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 9.
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 12).
4. Remove the two-piece bezel (see “Removing the two-piece bezel” on page 13).
5. Use a screwdriver to pry the filler panel and EMC shield away from the server.
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 from the side of the drive cage of bays 1 or 2. Slide the drive retainer clip to the right to remove it from the drive cage; then, snap the drive retainer clip into the screw holes on the side of the drive.



9. Slide the drive into the bay.

**Note:** A tape drive can be installed in bay 1 or 2.

10. Connect one end of the applicable signal cable into the rear of the drive and make sure that the other end of this cable is connected into the applicable 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 dual inline memory modules (DIMMs).
12. If you have another drive to install or remove, do so now.
13. Connect the power cable to the rear of the drive. The connectors are keyed and can be inserted only one way.

If you have other devices to install or remove, do so now; otherwise, go to “Completing the installation” on page 32.

## Installing a hot-swap SAS or hot-swap SATA hard disk drive

Some hot-swap SAS models support 2.5-inch or 3.5-inch hot-swap SAS hard disk drives. The hot-swap SATA models support 3.5-inch hot-swap SATA hard disk drives. Before you install a hot-swap hard disk drive, read the following information:

- Depending on your model, the server supports the following number of hot-swap drives:
  - Four 3.5-inch hot-swap SAS
  - Four 3.5-inch hot-swap SATA
  - Four 2.5-inch hot-swap SAS
  - Eight 2.5-inch hot-swap SAS
- You must install either all SAS hot-swap hard disk drives or all SATA hot-swap hard disk drives in the server. Do not use both SAS and SATA drives in the same server.

- Install drives in the following sequence:
  - For server models that support four hard disk drives, install the drives starting from the top bay to the bottom bay (bay 4, 5, 6, and then 7).
  - For server models that support eight hard disk drives, install the drives starting from left to right (bay 4, 5, 6, 7, 8, 9, 10, and then 11).
- Inspect the drive tray for signs of damage.
- Make sure that the drive is correctly installed in the tray.
- You do not have to turn off the server to install hot-swap drives in the hot-swap drive bays.

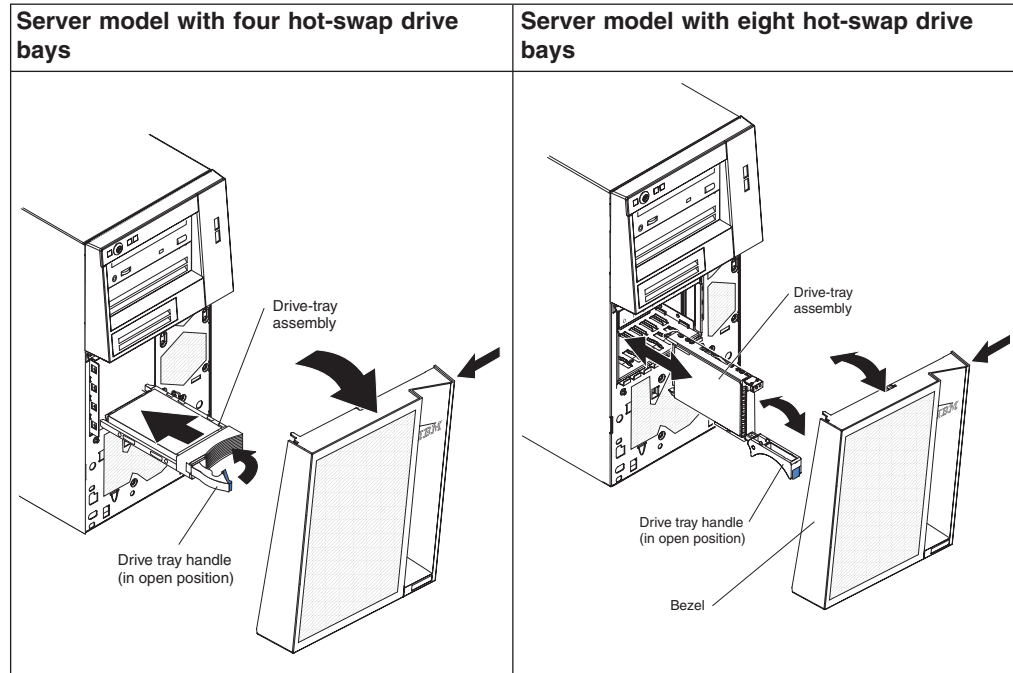
The server hot-swap bays are connected to a SAS/SATA hard disk drive backplane. This backplane, also known as the hot-swap-drive backplane, is the printed circuit board behind these bays.

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

To install a hot-swap SAS or hot-swap SATA hard disk drive, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 9.
2. Unlock the side cover.
3. Remove the lower bezel (see “Removing the two-piece bezel” on page 13).
4. 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.
5. Install the hard disk drive in the hot-swap bay:
  - a. Make sure that the drive tray handle is open.
  - b. Align the drive assembly with the guide rails in the bay.

Table 7. Illustrations of the server models with four and eight drive bays



- c. Gently push the drive assembly into the bay until the drive stops.
- d. Rotate the drive tray handle to the closed (locked) position.
- e. Check the hard disk drive status indicator to make sure that the hard disk drive is operating correctly. (You might have to restart the server before the drive is recognized.) If the amber hard disk drive status LED for a drive is lit continuously, it indicates that the drive is faulty and must be replaced. If the green hard disk drive activity LED is flashing, it indicates that the drive is being accessed.

**Note:** If the server is configured for RAID operation using an optional ServeRAID adapter, you might have to reconfigure your disk arrays after you install hard disk drives. See the ServeRAID documentation on the *IBM ServeRAID Support CD* for additional information about RAID operation and complete instructions for using ServeRAID Manager.

6. If you are installing additional hot-swap hard disk drives, do so now.

If you have other devices to install or remove, do so now; otherwise go to “Completing the installation” on page 32.

## IDs for hot-swap hard disk drives

On some models, the hot-swap-drive backplane controls the IDs of the internal hot-swap drive bays. The following table lists the IDs of the hard disk drives and backplane that are connected to one channel in the hot-swap models. In the typical configuration, the standard hard disk drives and backplane are connected to channel A. This table applies only to server models that support four hot-swap hard disk drives.

Table 8. Drive bay IDs for hot-swap SAS/SATA models with four drive bays

Drive bay	ID
4	0

Table 8. Drive bay IDs for hot-swap SAS/SATA models with four drive bays (continued)

Drive bay	ID
5	1
6	2
7	3

If your server is the eight-bay, 2.5 inch hot-swap SAS model, the IDs of the hard disk drives are shown in the following table.

Table 9. Drive bay IDs for the hot-swap 2.5-inch SAS models with eight bays

Drive bay	ID
4	0
5	1
6	2
7	3
8	4
9	5
10	6
11	7

## Installing a simple-swap SATA hard disk drive

Some server models support four 3.5-inch simple-swap SATA hard disk drives, which are accessible from the front of the server. You must disconnect all power from the server before you remove or install simple-swap drives in the server. Before you install a simple-swap SATA hard disk drive, read the following information:

- You can install four simple-swap SATA hard disk drives in the simple-swap models.
- Install the drives starting from the top bay to the bottom bay (bay 4, 5, 6, and then 7).
- The four simple-swap SATA hard disk drive connects to the SATA 0 through SATA 3 connectors on the system board as follows:
  - The drive in bay 4 connects to the SATA 0 connector on the system board.
  - The drive in bay 5 connects to the SATA 1 connector on the system board.
  - The drive in bay 6 connects to the SATA 2 connector on the system board.
  - The drive in bay 7 connects to the SATA 3 connector on the system board.
  -
- 

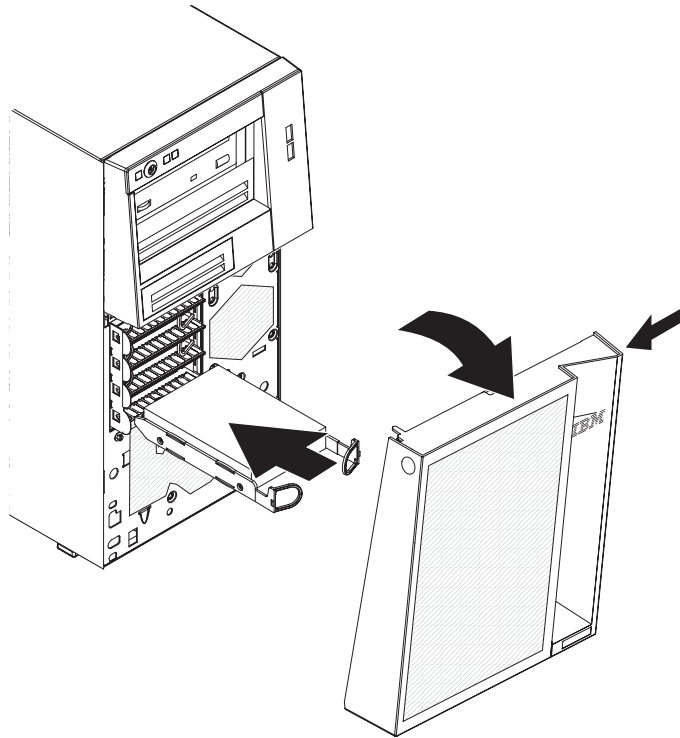
**Attention:** Simple-swap hard disk drives are not hot-swappable. Disconnect all power from the server before you remove or install a simple-swap hard disk drive.

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

1. Read the safety information that begins on page v and “Installation guidelines” on page 9.
2. Turn off the server and peripheral devices and disconnect all external cables and power cords.



3. Unlock the side cover (the bezel will not disengage from the server if the cover is locked).
4. Remove the lower bezel (see “Removing the two-piece bezel” on page 13).
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.
6. Align the drive assembly with the guide rails in the bay (the connector end of the drive goes in first).



7. Pull the loops of the drive assembly toward each other; then, carefully slide the drive assembly into the drive bay until it stops, and release the loops.

**Note:** Do not release the loops on the drive assembly until it is completely seated.

If you have other devices to install or remove, do so now; otherwise, go to “Completing the installation” on page 32.

The simple-swap-drive backplate controls the IDs of the internal simple-swap drive bays. The following table lists the IDs of the hard disk drives and backplate in simple-swap models. This table applies only to server models that support four hard disk drives.

*Table 10. Drive bay IDs for simple-swap models*

Drive bay	ID
4	0
5	1
6	2
7	3

## Power and signal cables for internal drives

The server uses cables to connect SATA-attached, simple-swap SATA, hot-swap SAS, and hot-swap SATA devices to the power supply and to the system board. (For the locations of the system-board connectors, see the *User's Guide* on the IBM *System x Documentation* CD.) Review the following information before you connect 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 connectors is connected to the drive and that the connector at the other end of the signal cable is connected to the system board.

The following cables are provided:

- **Power cables:** Four-wire power cables connect the drives to the power supply. At the ends 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 SATA power cable with SATA 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 SATA attached, SATA, SAS, and diskette drives to the system board. Two or three types of signal cables come with the server:
    - **SATA attached (for optical drives):** The flat SATA-attached signal cable has two connectors. One of these connectors is attached to the optical drive, and one is attached to one of the connectors on the system board.
    - **(Optional) USB diskette drive:** The narrower signal cable has two connectors. One is attached to the diskette drive, and the other is connected to the floppy drive connector (J11) on the system board.
    - **Simple-swap SATA:** Simple-swap SATA models come with four SATA cables that are already connected to the system board and the backplate at the rear of the simple-swap drive cage.
    - **Hot-swap SAS/SATA:** Hot-swap SAS/SATA models come with a single data cable that connects the SAS/SATA controller to the hot-swap backplane. This cable provides inherent connectivity for the four SAS or SATA drives that the server supports. Therefore, additional cabling is not required for these drives.
- For more information about the requirements for SAS/SATA cable and connecting SAS/SATA devices, see the documentation that comes with these devices.

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

---

## Installing an adapter

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

- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this section. If you have 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 your operating system.
- The server comes with the following adapter connectors or slots:
  - Slot 1, PCI Express x8

- Slot 2, PCI Express x4 (x1)

**Important:** The x4 designation in parentheses for slot 2 identifies an x4 slot that is designed to support x4 and x1 adapters that can downshift to operate at the x1 bandwidth. For example, if you install an x4 adapter in slot 2 that can downshift to x1 bandwidth, it will run at the x1 bandwidth. The x4 connector (slot 2) can be used for x1 and x4 adapters. Check the information that comes with your adapter for compatibility information.

- Slot 3, PCI-X 64-bit/133 MHz

**Note:** PCI-X slot 3 is enabled when the optional mini-PCI-X enablement card is installed in the mini-PCI slot on the system board. When no mini-PCI-X enablement card is installed, PCI-X slot 3 has no function.

- Slot 4, PCI 32-bit/33 MHz

- Slot 5, PCI 32-bit/33 MHz

- Some server models come with a mini-SAS/SATA RAID controller installed. The SAS/SATA RAID controller enables integrated RAID level-0 and level-1. Some models also come with a ServeRAID-MR10i SAS/SATA controller that enables integrated RAID level-5 capability.
- The ServeRAID-MR10i SAS/SATA controller must be installed in slot 1, PCI Express x8.
- You can install the mini-PCI-X enablement card or the mini-SAS/SATA RAID controller in the mini-PCI slot on the system board.
- When the optional mini-PCI-X enablement card is installed in the mini-PCI slot, it passes PCI-X signals from the mini-PCI-X Enablement Card to PCI-X slot 3.
- When the optional mini-PCI-X enablement card is installed in the server, the server cannot support RAID level-0 and level-1.
- You can install full-length adapters that are included in the ServerProven list in slots 1 through 5 (depending on your model).
- The 64-bit slot 3 supports 3.3 V PCI-X adapters.
- The 32-bit slots 4 and 5 support 5.0 V keyed PCI adapters; they do not support 3.3 V keyed adapters. Universal adapters are supported in slots 4 and 5 if they are universally keyed.
- An optional IBM Remote Supervisor Adapter II SlimLine can be installed only in the dedicated connector on the system board. For additional information, see the documentation that comes with this adapter.
- When you start the server for the first time after you install a Remote Supervisor Adapter II SlimLine, the startup process will take several minutes longer than a typical startup.
- The server scans PCI Express x8 slot 1, PCI Express x4 slot 2, PCI-X slot 3, and PCI slots 4 and 5 to assign system resources. Then, the server starts the PCI devices in the following order, if you have not changed the default startup sequence: PCI Express x8 slot 1, PCI Express x4 slot 2, PCI-X slot 3, PCI slot 4, and PCI slot 5.
- For a list of supported optional devices for the server, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

For the locations of the expansion slots on the system board, see the *User's Guide* on the IBM *System x Documentation CD*.

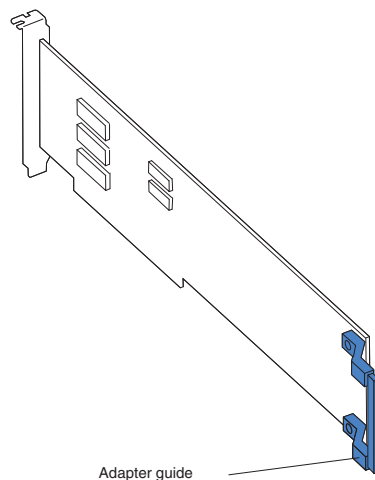
**Attention:** Static electricity that is released to internal server components when the server is powered-on might cause the server to stop, which might result in the loss of data. To avoid this potential problem, always use an electrostatic-discharge wrist strap or other grounding system when you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

To install an adapter, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 9.
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 12.
3. Follow the cabling instructions, if any, that come with the adapter. Route the adapter cables before you install the adapter.
4. Follow the instructions that come with the adapter to set jumpers or switches, if any.
5. Rotate the rear adapter-retention bracket to the open (unlocked) position and remove it from the server.
6. Remove the screw that secures the expansion-slot cover to the chassis. Store the expansion-slot cover and screw in a safe place for future use.

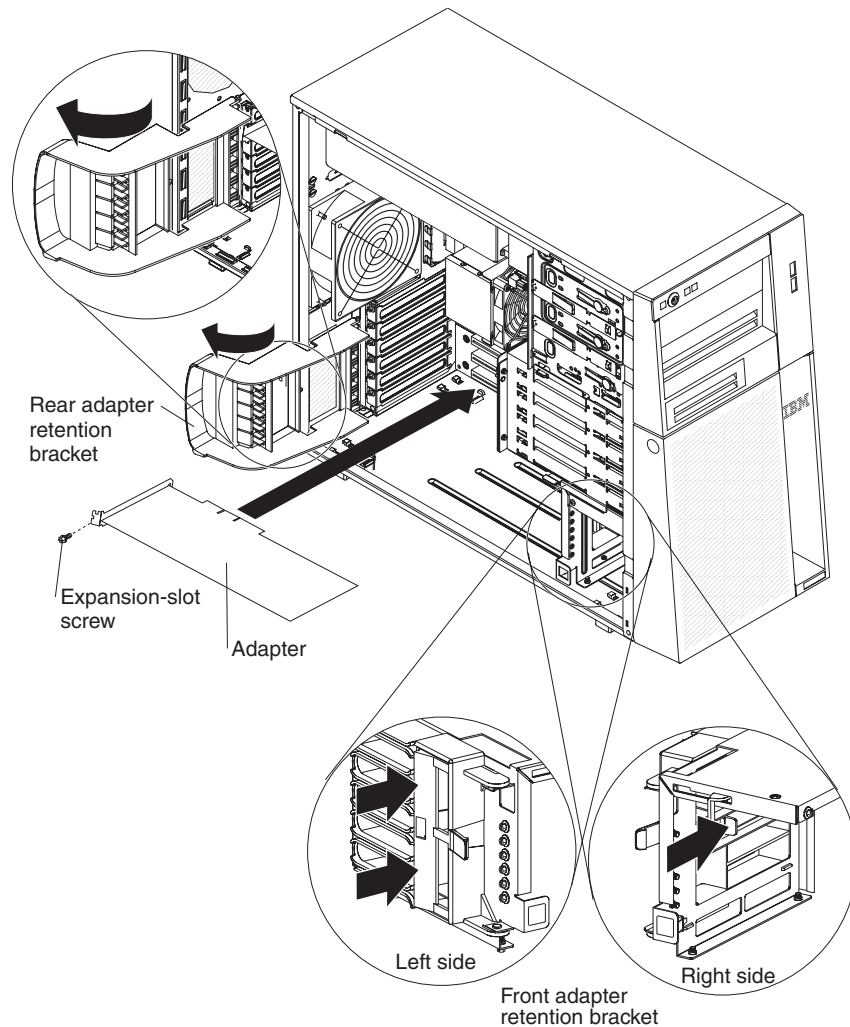
**Note:** Expansion-slot covers must be installed on all vacant slots. This maintains the electronic emissions standards of the server and ensures proper ventilation of server components.

7. 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.
8. If you are installing a full-length adapter, remove the blue adapter guide (if any) from the end of the adapter.



9. 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.



10. Install an expansion-slot screw at the rear of the adapter.
11. If you are installing a full-length adapter, press on the release lever on the right side of the front adapter-retention bracket to release the retaining tab on the left side of the bracket.
12. Connect required cables to the adapter. Route cables so that they do not block the flow of air from the fans.
13. Reinstall the rear adapter-retention bracket; then, rotate the bracket to the closed position.

**Note:** If any adapters in the server are large or have heavy cables attached to them, you can remove the rear adapter-retention bracket and secure all of the adapters with expansion-slot screws.

If you have other devices to install or remove, do so now; otherwise, go to “Completing the installation” on page 32.

---

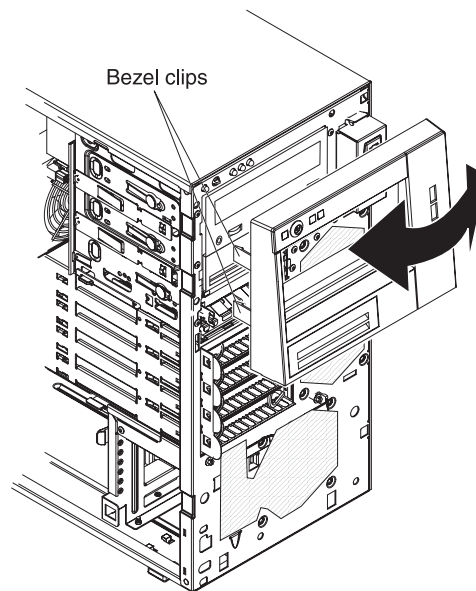
## Completing the installation

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

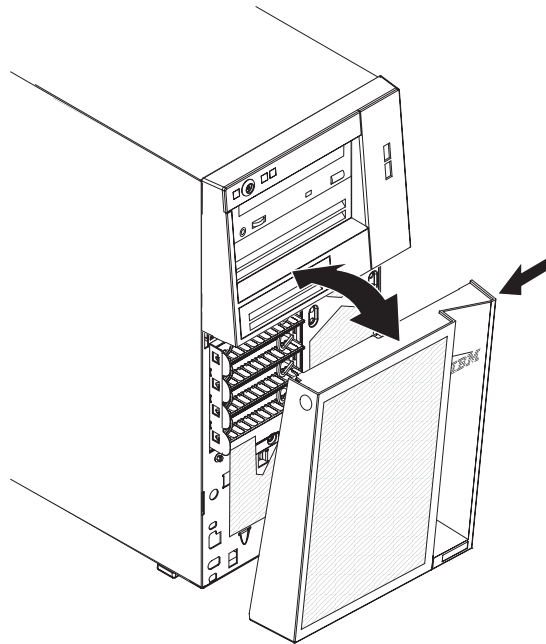
### Reinstalling the two-piece bezel

To reinstall the two-piece bezel, complete the following steps:

1. Install the upper bezel:
  - a. Insert the two right-side tabs on the upper bezel into the matching holes on the right side of the chassis.
  - b. Rotate the upper bezel to the left side of the chassis and press the bezel clips into the matching indentations on the left side of the chassis until the bezel clips snap into place.



2. Install the lower bezel:



- a. Insert the two bottom tabs on the lower bezel into the matching holes in the front of the chassis.
- b. Rotate the top of the lower bezel up to the chassis; then, press the blue release tab on the right side of the lower bezel and completely close the lower bezel until it locks securely into place.

## Reinstalling the side cover

If you removed the bezel, reinstall it before you reinstall the side cover. See “Reinstalling the two-piece bezel” on page 32.

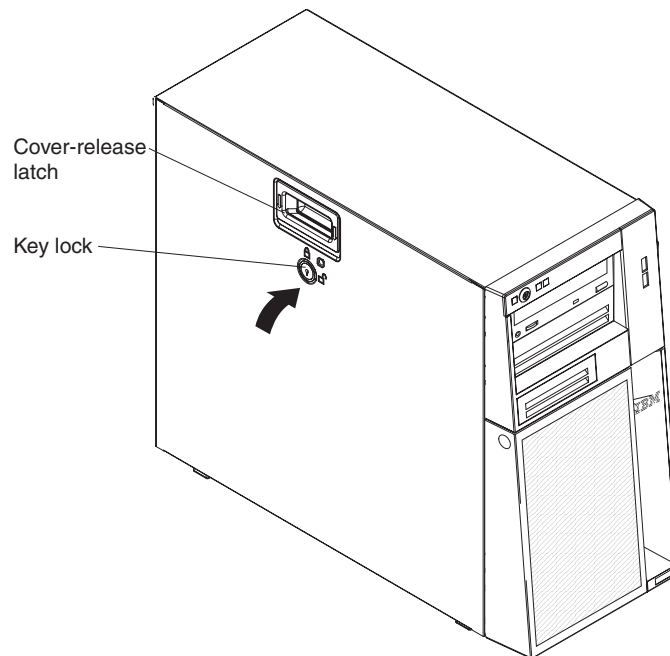
**Note:** The rear adapter-retention bracket rests against the server side cover. You might find it easier to lay the server on its side to reinstall the side cover.

To reinstall the side cover, complete the following steps:

1. Before you install the side cover, make sure that all cables, adapters, and other components are installed and seated correctly and that you have not left loose tools or parts inside the server. Also, make sure that all internal cables are correctly routed.

**Note:** The cover-release latch must be in the unlocked (opened) position before you install the side cover.

2. Position the lip on the bottom edge of the side cover on the ledge on the bottom of the chassis; then, rotate the cover up to the chassis, and then press down on the cover release latch and push the cover completely closed until it latches securely into place.



3. Close the cover-release latch to secure the side cover in place.
4. Lock the side cover.



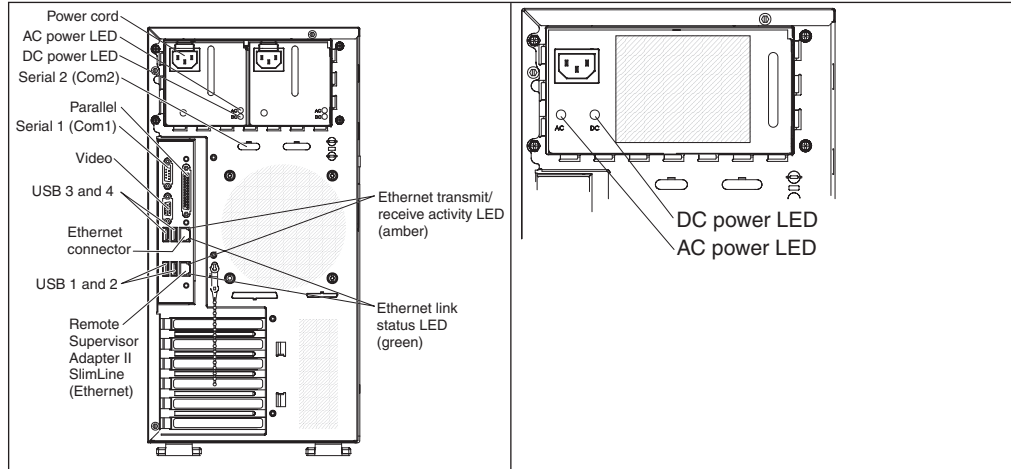
## Connecting the cables

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

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

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

Table 11. 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 or external device, you might receive a message that the configuration has changed. The Configuration/Setup Utility program starts automatically so that you can save the new configuration settings. For more information, see the section about configuring the server in the *User's Guide* on the *IBM System x Documentation CD*.

Some optional devices have device drivers that you must install. For information about installing device drivers, see the documentation that comes with each device.

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

If you have installed a Remote Supervisor Adapter II SlimLine to manage the server remotely, see the Remote Supervisor Adapter II documentation for information about setting up, configuring, and using the adapter.

---

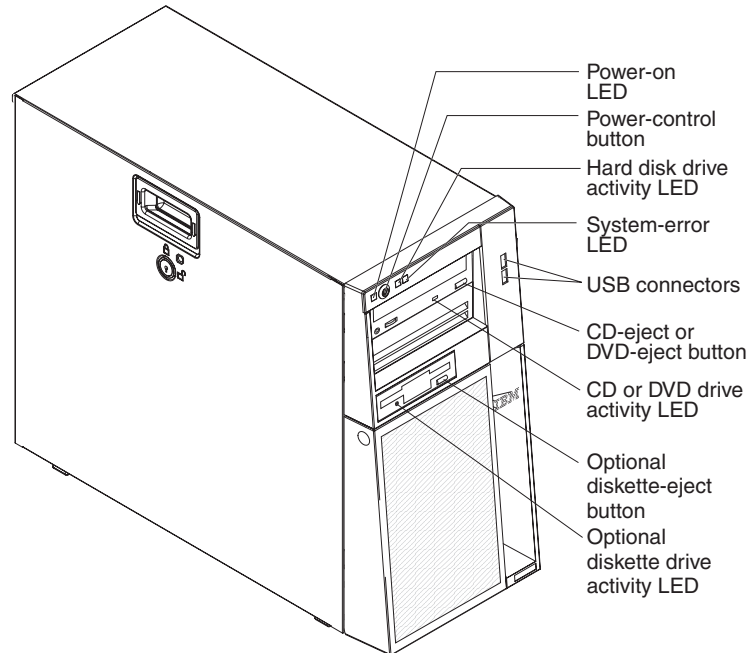
## Chapter 3. Server controls, LEDs, and power

This section 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.



#### Power-on LED

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

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

#### Power-control button

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

#### Hard disk drive activity LED

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

#### System-error LED

When this amber LED is lit, it indicates that a system error has occurred. An LED on the system board might also be lit to help isolate the error. See Chapter 5, "Solving problems," on page 47 for additional information.

Detailed troubleshooting information is in the *Problem Determination and Service Guide* on the IBM System x Documentation CD.

**Note:** When a PCI Express error LED and the system-error LED is lit, it indicates that a PCI Express error has occurred. The system-error LED will turn off when you reboot the server. When a DIMM error LED and the system-error LED is lit, it indicates that a DIMM error has occurred. After you correct the DIMM error, the DIMM error LED and the system-error LED will turn off.

#### **USB connectors**

Connect USB devices to these connectors.

#### **CD-eject or DVD-eject button**

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

#### **CD or DVD drive activity LED**

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

#### **(Optional) diskette-eject button**

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

#### **(Optional) diskette drive activity LED**

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

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

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

When the drive is removed, this LED also is visible on the hard disk drive backplane, next to the drive connector. The backplane is the printed circuit board behind drive bays 4 through 7 (or bays 4 through 11 on some 2.5-inch hard disk drive SAS models).

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

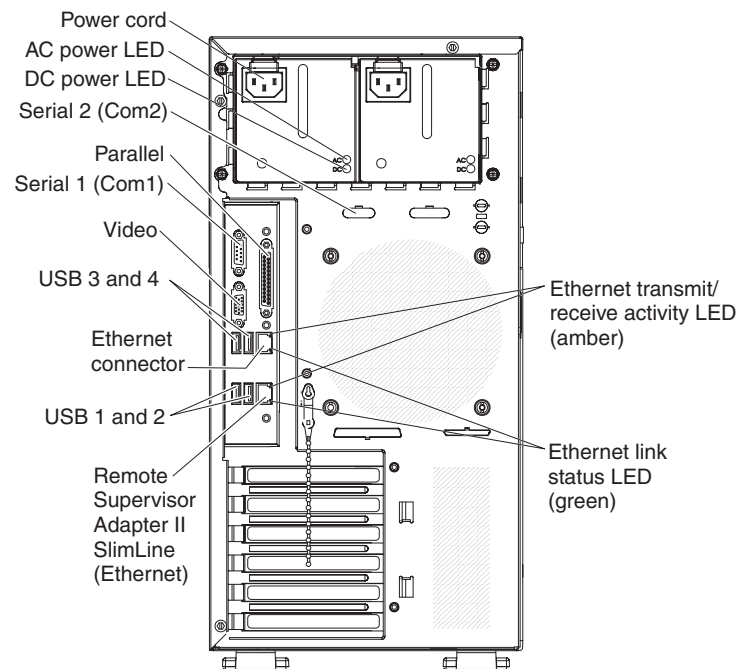
On some server models, each hot-swap hard disk drive has an amber status LED. If this amber status LED for a drive is lit, it indicates that the associated hard disk drive has failed.

If an optional IBM ServeRAID controller is installed in the server and the LED flashes slowly (one flash per second), it indicates that the drive is being rebuilt. When the LED is flashing rapidly (three flashes per second), it indicates that the controller is identifying the drive.

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

## Rear view

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



### Power-cord connector

Connect the power cord to this connector.

### AC power LED

On some server models, each hot-swap power supply has an ac power LED and a dc power LED. During typical operation, both the ac and dc power LEDs are lit.

### DC power LED

On some server models, each hot-swap power supply has a dc power LED and an ac power LED. During typical operation, both the ac and dc power LEDs are lit.

### Serial 2 connector

Connect a 9-pin serial device to this connector.

### Parallel connector

Connect a parallel device to this connector.

### Serial 1 connector

Connect a 9-pin serial device to this connector.

### Video connector

Connect a monitor to this connector.

### USB connectors

Connect USB devices to these connectors.

### Ethernet connector

Use this connector to connect the server to a network.

**Ethernet transmit/receive activity LED**

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

**Ethernet link status LED**

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

**Remote Supervisor Adapter II SlimLine/Ethernet connector**

Use this connector to connect the Remote Supervisor Adapter II SlimLine to a 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 except the service processor is shut down; however, the server can respond to requests from the service processor, such as a remote request to turn on the server. The power-on LED flashes to indicate that the server is connected to ac power but 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 systems-management software for an optional Remote Supervisor Adapter II SlimLine, the systems-management software can turn on the server.
- If your operating system supports the Wake on LAN feature, the Wake on LAN feature can turn on the server.
- If an optional Remote Supervisor Adapter II SlimLine is installed in the server, the server can be turned on from the Remote Supervisor Adapter II SlimLine user interface.

**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 optional devices.

## Turning off the server

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

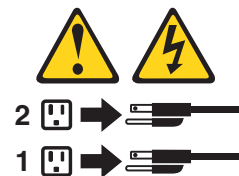
Some operating systems require an orderly shutdown before you turn off the server. See your operating-system documentation for information about shutting down the operating system.

**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 an optional Remote Supervisor Adapter II SlimLine is installed in the server, the server can be turned off from the Remote Supervisor Adapter II SlimLine user interface.
- 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 the server to configure basic hardware features and to simplify the operating-system installation.

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

- Configuration/Setup Utility program
- Mini-baseboard management controller utility programs
- Boot Menu program
- Broadcom NetXtreme Gigabit Ethernet Boot Agent
- Broadcom NetXtreme Gigabit Ethernet controller configuration
- LSI Logic Configuration Utility program

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

---

### Using the ServerGuide Setup and Installation CD

The *ServerGuide Setup and Installation* CD provides programs to detect the server model and installed optional hardware devices, configure the server hardware, provide device drivers, and help you install the operating system. For information about the supported operating-system versions, see the label on the CD. If the *ServerGuide Setup and Installation* CD did not come with the server, to download the latest version, go to <http://www.ibm.com/systems/management/serverguide/sub.html> and click **IBM Service and Support Site**.

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

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 69.
2. Follow the instructions on the screen to:
  - a. Select your language.
  - b. Select your keyboard layout and country.
  - c. View the overview to learn about ServerGuide features.
  - d. View the readme file to review installation tips about your operating system and adapter.
  - e. Start the setup and hardware configuration programs.
  - f. Start the operating-system installation. You will need your operating-system CD.

---

## Using the Configuration/Setup Utility program

Configuration/Setup is a menu-driven utility that is part of the BIOS. You can use it to perform the following tasks:

- Change interrupt request (IRQ) settings
- Change the startup sequence
- Configure serial port assignments
- 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. If the server is already on when you start this procedure, you must shut down the operating system, turn off the server, wait a few seconds until all in-use LEDs are turned off, and restart the server.
2. When the message Press F1 for Configuration/Setup, Press F12 for Boot Menu is displayed, press F1. (This prompt is displayed on the screen for only a few seconds. You must press F1 quickly.) If you have set both a power-on password and an administrator password, you must type the administrator password to access the full Configuration/Setup Utility menu.
3. Follow the instructions on the screen.

---

## 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. Restart the server.
2. Press F12.
3. 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 optional devices occurs 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. From the Configuration/Setup Utility main menu, select **Devices and I/O Ports** and press Enter. Select **Planar Ethernet** and set it to **Enabled**, if it is not already enabled. Press Esc to exit.
- 2.

3. From the **Start Options** menu choice, press Enter and make sure that **Planar Ethernet PXE/DHCP** is set to **Enabled**. Select **Startup Sequence Options** and press Enter; then, set the network-planar device as the first startup device.
4. Press Esc twice to exit.
5. Select **Save Settings** in the Configuration/Setup Utility main menu and press Enter to save your changes.

---

## 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 to enable the operating system to address the controller. For device drivers and information about configuring the Ethernet controller, see the *Broadcom NetXtreme Gigabit Ethernet Software* CD that comes with the server. To find updated information about configuring the controller, complete the following steps.

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

1. Go to <http://www.ibm.com/systems/support/>
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Publications lookup**.
4. From the **Product family** menu, select **System x3200 M2** and click **Continue**.

---

## LSI Configuration Utility program

Use the LSI Configuration Utility program to configure and manage redundant array of independent disks (RAID) arrays. Be sure to use these programs as described in this document.

- Use the LSI Configuration Utility program to:
  - Perform a low-level format on a SAS hard disk drive
  - Create an array of SAS hard disk drives with or without a hot-spare drive
  - Set SAS protocol parameters on SAS hard disk drives

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

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

Consider the following information when you are using the LSI Configuration Utility program to configure and manage arrays:

- The integrated SAS/SATA controller with RAID capabilities supports the following features:
  - Integrated Mirroring (IM) with hot-spare support (also known as RAID 1)  
Use this option to create an integrated array of two disks plus up to two optional hot spare. All data on the primary disk can be migrated.
  - Integrated Mirroring Enhanced (IME) with hot-spare support (also known as RAID 1E)  
Use this option to create an integrated mirror enhanced array of three to eight disks, including up to two optional hot spare. All data on the array disks will be deleted.
  - Integrated Striping (IS) (also known as RAID 0)  
Use this option to create an integrated striping array of two to eight disks. All data on the array disk will be deleted.
- Hard disk drive capacities affect how you create arrays. The drives in an array can have different capacities, but the RAID controller treats them as if they all have the capacity of the smallest hard disk drive.
- If you use an integrated SAS/SATA controller with RAID capabilities to configure a RAID 1 (mirrored) array after you have installed the operating system, you will lose access to any data or applications that were previously stored on the secondary drive of the mirrored pair.
- If you install a different type of RAID controller, see the documentation that comes with the controller for information about viewing and changing SAS settings for attached devices.

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

1. Turn on the server.
2. When the message <<< Press <CTRL-C> to start LSI Configuration Utility >>> is displayed, press Ctrl-C. If an administrator password has been set, you are prompted to type the password.
3. Use the arrow keys to select a controller (channel) from the list of adapters; then, press Enter.
4. To change the settings of the selected items, follow the instructions on the screen. If you select **Raid Properties**, **SAS Topology**, or **Advanced Adapter Properties**, additional screens are displayed.

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

See the *User's Guide* on the IBM *System x Documentation* CD for more information about the LSI Configuration Utility program.

---

## Chapter 5. Solving problems

This chapter 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 a problem by using the information in this chapter, see Appendix A, “Getting help and technical assistance,” on page 73, the *Problem Determination and Service Guide* on the IBM System x Documentation CD, and the “Server Support” flowchart in the front 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 beep 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 are displayed also if POST detects a hardware-configuration problem.

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

- **Troubleshooting tables**

These tables list problem symptoms and actions to correct the problems. See “Troubleshooting tables” on page 58 for more information.

- **Diagnostic programs and error messages**

The Dynamic System Analysis (DSA) Preboot diagnostic programs are the primary method of testing the major components of the server. These programs are on the IBM *Dynamic System Analysis Preboot Diagnostic* CD. If this CD did not come with the server, complete the following steps to download it.

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

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

For additional information about the DSA diagnostic programs, see the *Problem Determination and Service Guide* on the IBM System x Documentation CD.

- **System-board error LEDs**

An LED on the system board might be lit to help isolate an error that is indicated by the system-error LED on the front of the server. See “System-board LEDs” on page 71 for more information.

---

### POST beep codes

POST emits one beep to signal successful completed. 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 System x Documentation CD for more information about the POST beep codes.

**One beep**

POST was completed successfully without detecting any errors.

**Repeating long beeps**

A memory error has occurred. Make sure that all DIMMs are correctly installed.

**Other beep codes**

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

## POST error codes

The following table provides an abbreviated list of the error codes that might appear during POST. See the *Problem Determination and Service Guide* on the IBM System x Documentation CD for more information about the POST error codes. To check for updated technical information, complete the following steps.

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

1. Go to <http://www.ibm.com/systems/support/>.
2. Under **Product support**, click **System x**.
3. Under **Popular links**, click **Publications lookup**.
4. From the **Product family** menu, select **System x3200 M2** and click **Continue**.

Table 12. Abbreviated list of POST error codes

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>		
Error code	Description	Action
062	Three consecutive boot failures using the default configuration.	<ol style="list-style-type: none"> <li>1. Update the system firmware to the latest level (see the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).</li> <li>2. (Trained service technician only) Replace the system board.</li> </ol>
101	Tick timer internal interrupt failure.	(Trained service technician only) Replace the system board.
102	Internal timer channel 2 test failure.	(Trained service technician only) Replace the system board.

Table 12. Abbreviated list of POST error codes (continued)

Error code	Description	Action
106	Diskette controller error.	<ol style="list-style-type: none"> <li>1. Make sure that the Configuration/Setup Utility program correctly reflects the diskette drive information.</li> <li>2. Reseat the diskette drive cable.</li> <li>3. Reseat the diskette drive.</li> <li>4. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. Diskette drive cable</li> <li>b. Diskette drive</li> <li>c. (Trained service technician only) System board</li> </ol> </li> </ol>
151	Real-time clock error.	<ol style="list-style-type: none"> <li>1. Reseat the battery.</li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
162	Invalid configuration information or CMOS random-access memory (RAM) checksum failure.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program, select <b>Load Default Settings</b>, and save the settings.</li> <li>2. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. Failing device (if the device is a FRU, the device must be reseated by a trained service technician only)</li> </ol> </li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. Failing device (if the device is a FRU, the device must be replaced by a trained service technician only)</li> <li>c. (Trained service technician only) System board</li> </ol> </li> </ol>

Table 12. Abbreviated list of POST error codes (continued)

Error code	Description	Action
163	Time of day not set.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program, select <b>Load Default Settings</b>, make sure that the date and time are correct, and save the settings.</li> <li>2. Reseat the battery.</li> <li>3. Clear CMOS. See the <i>Problem Determination and Service Guide</i> for information about how to clear CMOS.</li> <li>4. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
164	Memory size has changed.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program, select <b>Load Default Settings</b>.</li> <li>2. Reseat the DIMM.</li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. DIMM</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
175	Service processor flash code damaged or not loaded. <b>Note:</b> In this case, the service processor is the optional Remote Supervisor Adapter II SlimLine.	<ol style="list-style-type: none"> <li>1. Update the Remote Supervisor Adapter II SlimLine firmware (see the <i>Problem Determination and Service Guide</i> on the IBM <i>System x Documentation</i> CD).</li> <li>2. Replace the Remote Supervisor Adapter II SlimLine.</li> </ol>
178	Security hardware error.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program, select <b>Load Default Settings</b>, and save the settings.</li> <li>2. (Trained service technician only) Replace the system board.</li> </ol>



Table 12. Abbreviated list of POST error codes (continued)

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>		
Error code	Description	Action
184	Power-on password damaged.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program, select <b>Load Default Settings</b>, and save the settings.</li> <li>2. Reseat the battery.</li> <li>3. Clear CMOS. See the <i>Problem Determination and Service Guide</i> for information about how to clear CMOS.</li> <li>4. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. Battery</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
187	VPD serial number not set.	<ol style="list-style-type: none"> <li>1. Set the serial number by updating the BIOS code level (see “Updating the firmware” in the <i>Problem Determination and Service Guide</i>).</li> <li>2. (Trained service technician only) Replace the system board.</li> </ol>
188	Service processor firmware corrupted or not installed.	<ol style="list-style-type: none"> <li>1. Restart the server.</li> <li>2. Run the Configuration/Setup Utility program, select <b>Load Default Settings</b>, and save the settings.</li> <li>3. Update the Remote Supervisor Adapter II SlimLine firmware (see “Updating the firmware” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).</li> <li>4. (Trained service technician only) Replace the system board.</li> </ol>
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 system.	<ol style="list-style-type: none"> <li>1. Make sure that the DIMM is installed correctly (see “Installing a memory module” on page 15).</li> <li>2. Replace the DIMM.</li> <li>3. (Trained service technician only) Replace the system board.</li> </ol>
602	Invalid diskette boot record	<ol style="list-style-type: none"> <li>1. Replace the diskette.</li> <li>2. Reseat the diskette drive cables.</li> <li>3. Replace the diskette drive.</li> </ol>

Table 12. Abbreviated list of POST error codes (continued)

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>		
Error code	Description	Action
604	Internal diskette drive error	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program, select <b>Load Default Settings</b>, and save the settings.</li> <li>2. Reseat the diskette drive signal cables.</li> <li>3. Replace the diskette drive.</li> </ol>
962	Parallel port configuration error	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program and make sure that the parallel port setting is correct.</li> <li>2. (Trained service technician only) Replace the system board.</li> </ol>
1162	Serial port error	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program and make sure that the serial port settings are correct.</li> <li>2. (Trained service technician only) Replace the system board.</li> </ol>
1600	The service processor is not functioning.	(Trained service technician only) Replace the system board.
1601	System-management adapter communication error.	<ol style="list-style-type: none"> <li>1. Update the BMC firmware (see “Updating the Firmware” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).</li> <li>2. (Trained service technician only) Replace the system board.</li> </ol>
1603	System-management adapter communication error.	<ol style="list-style-type: none"> <li>1. Make sure that the Remote Supervisor Adapter II SlimLine is installed correctly.</li> <li>2. Update the Remote Supervisor Adapter II SlimLine firmware (see “Updating the firmware” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).</li> <li>3. Reseat the following components: <ol style="list-style-type: none"> <li>a. Adapter</li> <li>b. (Trained service technician only) System board</li> </ol> </li> <li>4. Replace the following components one at a time, in the order shown, restarting the server each time: <ol style="list-style-type: none"> <li>a. Remote Supervisor Adapter II SlimLine</li> <li>b. (Trained service technician only) Replace the system board.</li> </ol> </li> </ol>

Table 12. Abbreviated list of POST error codes (continued)

Error code	Description	Action
1762	Hard disk drive configuration error.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program and load the default settings.</li> <li>2. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Hard disk drive cables</li> <li>b. Hard disk drive</li> <li>c. (Trained service technician only) System board</li> </ol> </li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time.               <ol style="list-style-type: none"> <li>a. Hard disk drive cables</li> <li>b. Hard disk drive</li> <li>c. (Trained service technician only) System board</li> </ol> </li> </ol>
178x	Fixed disk error. <b>Note:</b> x is the drive that has the error.	<ol style="list-style-type: none"> <li>1. Run the hard disk drive diagnostic tests on drive x (see "Running the diagnostic programs" in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).</li> <li>2. Reseat the following components, depending on the server model:               <ul style="list-style-type: none"> <li>• Hot-swap models: Hard disk drive</li> <li>• Simple-swap models:                   <ol style="list-style-type: none"> <li>a. Hard disk drive x</li> <li>b. Hard disk drive x cable</li> </ol> </li> </ul> </li> <li>3. Replace the following components one at a time, depending on the server model, in the order shown, restarting the server each time:               <ul style="list-style-type: none"> <li>• Hot-swap models:                   <ol style="list-style-type: none"> <li>a. Hard disk drive x</li> <li>b. Hard disk drive backplane</li> </ol> </li> <li>• Simple-swap models:                   <ol style="list-style-type: none"> <li>a. Hard disk drive x</li> <li>b. Hard disk drive x cable</li> </ol> </li> </ul> </li> <li>4. (Trained service technician only) Replace the system board.</li> </ol>
1800	Unavailable PCI hardware interrupt.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program and adjust the adapter settings.</li> <li>2. Remove each adapter one at a time, restarting the server each time, until the failing adapter is isolated.</li> </ol>

Table 12. Abbreviated list of POST error codes (continued)

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>		
Error code	Description	Action
1801	A PCI or PCI Express adapter has requested memory resources that are not available.	<ol style="list-style-type: none"> <li>1. Make sure that no devices have been disabled in the Configuration/Setup Utility program.</li> <li>2. Change the order of the adapters in the PCI and PCI Express slots. Make sure that the startup (boot) device is positioned early in the scanning order. (For information about the scanning order, see the <i>User's Guide</i> on the IBM System x Documentation CD).</li> <li>3. Make sure that the settings for the adapter and all other adapters in the Configuration/Setup Utility program are correct. If the memory resource settings are not correct, change them.</li> <li>4. If all memory resources are being used, remove an adapter to make memory available to the adapter. Disabling the BIOS on the adapter should correct the error. See the documentation that comes with the adapter.</li> </ol>
1802	No more I/O space is available for a PCI or PCI Express adapter.	<ol style="list-style-type: none"> <li>1. If the error code indicates a particular PCI or PCI Express slot or device, remove that device.</li> <li>2. Reseat each adapter.</li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. Failing PCI or PCI Express adapter</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
1803	No more memory (above 1 MB for a PCI or PCI Express adapter).	<ol style="list-style-type: none"> <li>1. If the error code indicates a particular PCI or PCI Express slot or device, remove that device.</li> <li>2. Reseat each adapter.</li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. Failing PCI or PCI Express adapter</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>

Table 12. Abbreviated list of POST error codes (continued)

Error code	Description	Action
1804	No more memory (below 1 MB for a PCI or PCI Express adapter).	<ol style="list-style-type: none"> <li>1. Remove the failing adapter.</li> <li>2. Reseat each adapter.</li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. Failing PCI or PCI Express adapter</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
1805	PCI option ROM checksum error.	<ol style="list-style-type: none"> <li>1. Remove the failing adapter.</li> <li>2. Reseat each adapter.</li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. Failing PCI or PCI Express adapter</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
1806	PCI or PCI Express built in self-test failure.	<ol style="list-style-type: none"> <li>1. If the error code indicates a particular PCI or PCI Express slot or device, remove that device.</li> <li>2. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Each adapter</li> <li>b. (Trained service technician only, if the specified board is a FRU) The board that is indicated in the error code</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
1807	General PCI error.	<ol style="list-style-type: none"> <li>1. Make sure that no devices have been disabled in the Configuration/Setup Utility program.</li> <li>2. Replace each adapter one at a time, restarting the server each time.</li> </ol>

Table 12. Abbreviated list of POST error codes (continued)

Error code	Description	Action
1962	A drive does not contain a valid boot sector.	<ol style="list-style-type: none"> <li>1. Make sure that a bootable operating system is installed.</li> <li>2. Run the hard disk drive diagnostic tests (see “Running the diagnostic programs” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).</li> <li>3. Reseat the following components, depending on the server model:               <ul style="list-style-type: none"> <li>• Hot-swap models:                   <ol style="list-style-type: none"> <li>a. Hard disk drive</li> <li>b. SAS/SATA controller</li> </ol> </li> <li>• Simple-swap models:                   <ol style="list-style-type: none"> <li>a. Hard disk drive</li> <li>b. Hard disk drive cable</li> </ol> </li> </ul> </li> <li>4. Replace the following components one at a time, depending on the server model, in the order shown, restarting the server each time:               <ul style="list-style-type: none"> <li>• Hot-swap models:                   <ol style="list-style-type: none"> <li>a. Hard disk drive</li> <li>b. Hard disk drive backplane</li> <li>c. SAS/SATA controller</li> </ol> </li> <li>• Simple-swap models:                   <ol style="list-style-type: none"> <li>a. Hard disk drive</li> <li>b. Hard disk drive cable</li> </ol> </li> </ul> </li> <li>5. (Trained service technician only) Replace the system board.</li> </ol>
2462	Video memory configuration error.	<ol style="list-style-type: none"> <li>1. Reseat the following components:               <ol style="list-style-type: none"> <li>a. Video adapter (if one is installed)</li> <li>b. (Trained service technician only) System board</li> </ol> </li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. Video adapter (if one is installed)</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
3001	SMART monitoring failure predicted on hard disk drive	Replace the hard disk drive.
3003	SMART command execution failure on hard disk drive	Replace the hard disk drive.

Table 12. Abbreviated list of POST error codes (continued)

Error code	Description	Action
3005	Current hard disk drive configuration do not support SMART function	Replace the hard disk drive.
5962	DVD drive configuration error.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program and load the default settings (see "Using the Configuration/Setup Utility program" on page 44).</li> <li>2. Reseat the following components:               <ol style="list-style-type: none"> <li>a. DVD drive cable</li> <li>b. DVD drive</li> <li>c. System board</li> </ol> </li> <li>3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>
00012000	Processor machine check error.	<ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the microprocessor.</li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
00019701	Microprocessor failed the built in self-test (BIST).	<ol style="list-style-type: none"> <li>1. (Trained service technician only) Reseat the microprocessor.</li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time:               <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
01298001	No update data for microprocessor.	<ol style="list-style-type: none"> <li>1. Update the BIOS code again (see the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).</li> <li>2. (Trained service technician only) Reseat the microprocessor.</li> <li>3. (Trained service technician only) Replace the microprocessor.</li> </ol>

Table 12. Abbreviated list of POST error codes (continued)

Error code	Description	Action
01298101	Bad update data for processor.	<ol style="list-style-type: none"> <li>1. Update the BIOS code again (see the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).</li> <li>2. (Trained service technician only) Reseat the microprocessor.</li> <li>3. (Trained service technician only) Replace the microprocessor.</li> </ol>
I9990301	Hard disk drive boot sector error.	<ol style="list-style-type: none"> <li>1. Reseat the following components, depending on the server model:               <ul style="list-style-type: none"> <li>• Hot-swap models:                   <ol style="list-style-type: none"> <li>a. Hard disk drive</li> <li>b. SAS/SATA controller</li> </ol> </li> <li>• Simple-swap models:                   <ol style="list-style-type: none"> <li>a. Hard disk drive</li> <li>b. Hard disk drive cable</li> </ol> </li> </ul> </li> <li>2. Replace the following components one at a time, depending on the server model, in the order shown, restarting the server each time:               <ul style="list-style-type: none"> <li>• Hot-swap models:                   <ol style="list-style-type: none"> <li>a. Hard disk drive</li> <li>b. Hard disk drive backplane</li> <li>c. SAS/SATA controller</li> </ol> </li> <li>• Simple-swap models:                   <ol style="list-style-type: none"> <li>a. Hard disk drive</li> <li>b. Hard disk drive cable</li> </ol> </li> </ul> </li> <li>3. (Trained service technician only) Replace the system board.</li> </ol>
I9990650	AC power has been restored.	<ol style="list-style-type: none"> <li>1. Reseat the power cords.</li> <li>2. Check for interruption of the external power.</li> <li>3. Replace the power cords.</li> </ol>

## 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 System x Documentation CD for more detailed troubleshooting information. If you cannot find a 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 you use the troubleshooting tables:

1. Check the system-board LEDs or the LEDs on the front panel (see “System-board LEDs” on page 71).
2. Remove the software or device that you just added.
3. Run the diagnostic tests to determine whether the server is running correctly.
4. Reinstall the new software or new device.

## CD or DVD drive problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
The CD or DVD drive is not recognized.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The SATA channel to which the CD or DVD drive is attached (primary or secondary) is enabled in the Configuration/Setup Utility program.</li> <li>• All cables and jumpers are installed correctly.</li> <li>• The correct device driver is installed for the CD or DVD drive.</li> </ul> </li> <li>2. Run the CD or DVD drive diagnostic programs.</li> <li>3. Reseat the CD or DVD drive cable.</li> <li>4. Replace the following components one at a time, in the order shown, restarting the server each time: <ol style="list-style-type: none"> <li>a. CD or DVD drive cable</li> <li>b. CD or DVD drive</li> <li>c. (Trained service technician only) System board</li> </ol> </li> <li>5. Replace the components listed in step 4 one at a time, in the order shown, restarting the server each time.</li> </ol>
A CD or DVD is not working correctly.	<ol style="list-style-type: none"> <li>1. Clean the CD or DVD.</li> <li>2. Run the CD or DVD drive diagnostic programs.</li> <li>3. Reseat the CD or DVD drive cable.</li> <li>4. Replace the following components one at a time, in the order shown, restarting the server each time: <ol style="list-style-type: none"> <li>a. CD or DVD drive cable</li> <li>b. CD or DVD drive</li> </ol> </li> </ol>
The CD or DVD drive tray is not working.	<ol style="list-style-type: none"> <li>1. Make sure that the server is turned on.</li> <li>2. Insert the end of a straightened paper clip into the manual tray-release opening.</li> <li>3. Reseat the CD or DVD drive cable.</li> <li>4. Replace the following components one at a time, in the order shown, restarting the server each time: <ol style="list-style-type: none"> <li>a. CD or DVD drive cable</li> <li>b. CD or DVD drive</li> </ol> </li> </ol>

## Diskette drive problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
The diskette drive activity LED stays lit, or the server bypasses the diskette drive.	<ul style="list-style-type: none"> <li>• If there is a diskette in the drive, make sure that:             <ul style="list-style-type: none"> <li>– The diskette drive cables are correctly and securely connected.</li> <li>– The diskette drive is enabled in the Configuration/Setup Utility program.</li> <li>– The diskette is good and not damaged. (Try another diskette if you have one.)</li> <li>– The diskette is inserted correctly in the drive.</li> <li>– The diskette contains the necessary files to start the server.</li> <li>– Your software program is working properly.</li> </ul> </li> <li>• To prevent diskette drive read/write errors, make sure that the distance between monitors and diskette drives is at least 76 mm (3 in.).</li> <li>• Replace the diskette drive.</li> </ul>

## General problems

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

## Hard disk drive problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
Not all drives are recognized by the hard disk drive diagnostic test (the Fixed Disk Test or the SCSI Attached 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 server stops responding during the hard disk drive diagnostic test.	Remove the hard disk drive that was being tested when the server stopped responding, and run the diagnostic test again. If the hard disk drive diagnostic test runs successfully, replace the drive that you removed with a new one.

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
A 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 DiskDriveDiagnosticTest but the problem remains.	Run the diagnostic DiskDriveDiagnosticTest (see “Running the diagnostic programs” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).

## Intermittent problems

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

## Keyboard, mouse, or pointing-device problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See the parts listing in the *Problem Determination and Service Guide* 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"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The keyboard is compatible with the server. See <a href="http://www.ibm.com/servers/eserver/serverproven/compat/us/">http://www.ibm.com/servers/eserver/serverproven/compat/us/</a>.</li> <li>• The keyboard cable is securely connected.</li> <li>• The server and the monitor are turned on.</li> </ul> </li> <li>2. If you are using a USB keyboard, run the Configuration/Setup Utility program and enable keyboardless operation to prevent a POST error message from being displayed during startup.</li> <li>3. If you are using a USB keyboard and it is connected to a USB hub, disconnect the USB keyboard from the hub and connect it directly to the server.</li> <li>4. Replace the following components one at a time, in the order shown, restarting the server each time: <ol style="list-style-type: none"> <li>a. Keyboard</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
The mouse or pointing device does not work.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The mouse is compatible with the server. See <a href="http://www.ibm.com/servers/eserver/serverproven/compat/us/">http://www.ibm.com/servers/eserver/serverproven/compat/us/</a>.</li> <li>• The mouse or pointing-device cable is securely connected to the server.</li> <li>• The mouse or pointing-device drivers are installed correctly.</li> <li>• The server and the monitor are turned on.</li> <li>• The mouse option is enabled in the Configuration/Setup Utility program.</li> </ul> </li> <li>2. If you are using a USB mouse or pointing device and it is connected to a USB hub, disconnect the mouse or pointing device from the hub and connect it directly to the server.</li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time: <ol style="list-style-type: none"> <li>a. Mouse or pointing device</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>

## Memory problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See 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.

Symptom	Action
The amount of system memory that is displayed is less than the amount of installed physical memory.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• No error LEDs are lit on the front-panel assembly or on the system board.</li> <li>• The memory modules are seated correctly.</li> <li>• You have installed the correct type of memory.</li> <li>• If you changed the memory, you updated the memory configuration in the Configuration/Setup Utility program.</li> <li>• All DIMMs are enabled. The server might have automatically disabled a DIMM when it detected a problem.</li> <li>• If a DIMM was disabled by a system-management interrupt (SMI), replace the DIMM.</li> </ul> </li> <li>2. Check the POST error log for error message 289. If POST error message 289 is in the error log, perform the actions listed in the POST error codes table (see “POST error codes” on page 48). Otherwise, continue to step 3.</li> <li>3. Run memory diagnostics (see “Running the diagnostic programs” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).</li> <li>4. Make sure that there is no memory mismatch when the server is over the minimum memory configuration (one 512 MB DIMM) and that you have installed the correct number of DIMMs (see the <i>User’s Guide</i> on the IBM System x Documentation CD for information about the supported DIMM configurations).</li> <li>5. Reseat the DIMMs.</li> <li>6. Replace the following components one at a time, in the order shown, restarting the server each time: <ol style="list-style-type: none"> <li>a. DIMMs</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>

## Microprocessor problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
The server emits a continuous beep during POST, indicating that the startup (boot) microprocessor is not working correctly.	<ol style="list-style-type: none"> <li>1. Make sure that the microprocessor is supported on this server.</li> <li>2. (Trained service technician only) Make sure that the microprocessor is seated correctly.</li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time:             <ol style="list-style-type: none"> <li>a. (Trained service technician only) Microprocessor</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>

## Monitor problems

Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, see the information that comes with the monitor for instructions for testing and adjusting the monitor.

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
Testing the monitor	<ol style="list-style-type: none"> <li>1. Make sure that the monitor cables are firmly connected.</li> <li>2. Try using a different monitor on the server, or try using the monitor that is being tested on a different server.</li> <li>3. Run the diagnostic programs. If the monitor passes the diagnostic programs, the problem might be a video device driver.</li> <li>4. Reseat the Remote Supervisor Adapter II SlimLine (if one is installed).</li> <li>5. Replace the Remote Supervisor Adapter II SlimLine (if one is installed).</li> <li>6. (Trained service technician only) Replace the system board.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See 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.

Symptom	Action
The screen is blank.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The server is turned on. If there is no power to the server, see “Power problems” on page 68.</li> <li>• The monitor cables are connected correctly.</li> <li>• The monitor is turned on and the brightness and contrast controls are adjusted correctly.</li> <li>• A single beep sounds when the server is turned on, indicating the successful completion of POST..</li> </ul> </li> <li>2. Make sure that the correct server is controlling the monitor, if applicable.</li> <li>3. Make sure that damaged BIOS code is not affecting the video; see “Recovering from a BIOS update failure” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD.</li> <li>4. See “Solving undetermined problems” in the <i>Problem Determination and Service Guide</i>.</li> </ol>
The monitor works when you turn on the server, but the screen goes blank when you start some application programs.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The application program is not setting a display mode that is higher than the capability of the monitor.</li> <li>• You installed the necessary device drivers for the application.</li> </ul> </li> <li>2. Run video diagnostics (see “Running the diagnostic programs” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD). <ul style="list-style-type: none"> <li>• If the server passes the video diagnostics, the video is good; see “Solving undetermined problems” in the <i>Problem Determination and Service Guide</i>.</li> <li>• (Trained service technician only) If the server fails the video diagnostics, replace the system board.</li> </ul> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See 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.

Symptom	Action
<p>The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.</p>	<ol style="list-style-type: none"> <li>1. If the monitor self-tests show that the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. <b>Attention:</b> Moving a color monitor while it is turned on might cause screen discoloration. Move the device and the monitor at least 305 mm (12 in.) apart, and turn on the monitor. <b>Notes:</b> <ol style="list-style-type: none"> <li>a. To prevent diskette drive read/write errors, make sure that the distance between the monitor and any external diskette drive is at least 76 mm (3 in.).</li> <li>b. Non-IBM monitor cables might cause unpredictable problems.</li> </ol> </li> <li>2. Reseat the monitor cable.</li> <li>3. Reseat the Remote Supervisor Adapter II SlimLine</li> <li>4. Replace the following components one at a time, in the order shown, restarting the server each time:           <ol style="list-style-type: none"> <li>a. Monitor</li> <li>b. Remote Supervisor Adapter II SlimLine</li> <li>c. (Trained service technician only) System board</li> </ol> </li> </ol>
<p>Wrong characters appear on the screen.</p>	<ol style="list-style-type: none"> <li>1. If the wrong language is displayed, update the BIOS code with the correct language (see “Updating the firmware” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).</li> <li>2. Reseat the monitor cable.</li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time:           <ol style="list-style-type: none"> <li>a. Monitor</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>



## Optional-device problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
An IBM optional device that was just installed does not work.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The device is designed for the server (see <a href="http://www.ibm.com/servers/eserver/serverproven/compat/us/">http://www.ibm.com/servers/eserver/serverproven/compat/us/</a>).</li> <li>• You followed the installation instructions that came with the device and the device is installed correctly.</li> <li>• You have not loosened any other installed devices or cables.</li> <li>• You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or any other device is changed, you must update the configuration.</li> </ul> </li> <li>2. Reseat the device that you just installed.</li> <li>3. Replace the device that you just installed.</li> </ol>
An IBM optional device that used to work does not work now.	<ol style="list-style-type: none"> <li>1. Make sure that all of the cable connections for the device are secure.</li> <li>2. If the device comes with test instructions, use those instructions to test the device.</li> <li>3. Reseat the failing device.</li> <li>4. Replace the failing device.</li> </ol>

## Power problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
<p>The power-control button does not work (the server does not start).</p> <p><b>Note:</b> The power-control button will not function until 20 seconds after the server has been connected to ac power.</p>	<ol style="list-style-type: none"> <li>1. Make sure that the front-panel assembly power-control button is working correctly:             <ol style="list-style-type: none"> <li>a. Disconnect the server power cords.</li> <li>b. Reconnect the power cords.</li> <li>c. Press the power-control button.</li> </ol> </li> <li>2. Make sure that:             <ul style="list-style-type: none"> <li>• The power cords are correctly connected to the server and to a working electrical outlet.</li> <li>• The server contains the correct type of DIMMs.</li> <li>• The DIMMs are correctly seated.</li> <li>• The LEDs on the power supply do not indicate a problem.</li> <li>• The microprocessor is correctly installed.</li> </ul> </li> <li>3. Reseat the following components:             <ol style="list-style-type: none"> <li>a. DIMMs</li> <li>b. Power supply cables to all internal components</li> <li>c. Power supplies (hot-swap models)</li> </ol> </li> <li>4. Replace the following components one at a time, in the order shown, restarting the server each time:             <ol style="list-style-type: none"> <li>a. DIMMs</li> <li>b. Power supplies (hot-swap models)</li> <li>c. (Trained service technician only) Power supply (non-hot swap models)</li> </ol> </li> <li>5. If you just installed an optional device, remove it, and restart the server. If the server now starts, you might have installed more devices than the power supply supports.</li> <li>6. See “Power-supply LEDs” and “Solving undetermined problems” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD.</li> </ol>
The server does not turn off.	<ol style="list-style-type: none"> <li>1. Determine whether you are using an Advanced Configuration and Power Management (ACPI) or a non-ACPI operating system. If you are using a non-ACPI operating system, complete the following steps:             <ol style="list-style-type: none"> <li>a. Press Ctrl+Alt+Delete.</li> <li>b. Turn off the server by holding the power-control button for 5 seconds.</li> <li>c. Restart the server.</li> <li>d. If the server fails POST and the power-control button does not work, disconnect the ac power cord for 20 seconds; then, reconnect the ac power cord and restart the server.</li> </ol> </li> <li>2. (Trained service technician only) If the problem remains or if you are using an ACPI-aware operating system, suspect the system board.</li> </ol>
The server unexpectedly shuts down, and the LEDs on the front-panel assembly are not lit.	See “Solving undetermined problems” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD.

## Serial-device problems

For more information about the serial port, see the *Problem Determination and Service Guide* on the IBM System x Documentation CD.

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
The number of serial ports that are identified by the operating system is less than the number of installed serial ports.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• Each port is assigned a unique address in the Configuration/Setup Utility program and none of the serial ports is disabled.</li> <li>• The serial-port adapter (if one is installed) is seated correctly.</li> </ul> </li> <li>2. Reseat the serial-port adapter.</li> <li>3. Replace the serial-port adapter.</li> <li>4. (Trained service technician only) System board</li> </ol>
A serial device does not work.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The device is compatible with the server.</li> <li>• The serial port is enabled and is assigned a unique address.</li> <li>• The device is connected to the correct connector. (For connector locations, see “Internal connectors, LEDs, and jumpers” in the <i>User’s Guide</i> on the IBM System x Documentation CD.)</li> </ul> </li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Failing serial device</li> <li>b. Serial cable</li> <li>c. Remote Supervisor Adapter II SlimLine (if one is present)</li> </ol> </li> <li>3. Replace the following components one at a time, in the order shown, restarting the server each time: <ol style="list-style-type: none"> <li>a. Failing serial device</li> <li>b. Serial cable</li> <li>c. Remote Supervisor Adapter II SlimLine (if one is present)</li> <li>d. (Trained service technician only) System board</li> </ol> </li> </ol>

## ServerGuide problems

Table 13. ServerGuide Setup and Installation CD

Symptom	Action
The <i>ServerGuide Setup and Installation</i> CD will not start.	<ul style="list-style-type: none"> <li>• Make sure that the server supports the ServerGuide program and has a startable (bootable) CD or DVD drive.</li> <li>• If the startup (boot) sequence settings have been changed, make sure that the CD or DVD drive is first in the startup sequence.</li> <li>• If more than one CD or DVD drive is installed, make sure that only one drive is set as the primary drive. Start the CD from the primary drive.</li> </ul>
The ServeRAID Manager program cannot view all installed drives, or the operating system cannot be installed.	<ul style="list-style-type: none"> <li>• Make sure that the hard disk drive is connected correctly.</li> <li>• Make sure that the SAS hard disk drive cables are securely connected.</li> </ul>

Table 13. ServerGuide Setup and Installation CD (continued)

Symptom	Action
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 CD</i> label for a list of supported operating-system versions.
The operating system cannot be installed; the option is not available.	Make sure that the server supports the operating-system. If it does, either no logical drive is defined (RAID servers), or the ServerGuide System Partition is not present. Run the ServerGuide program and make sure that setup is complete.

## Software problems

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

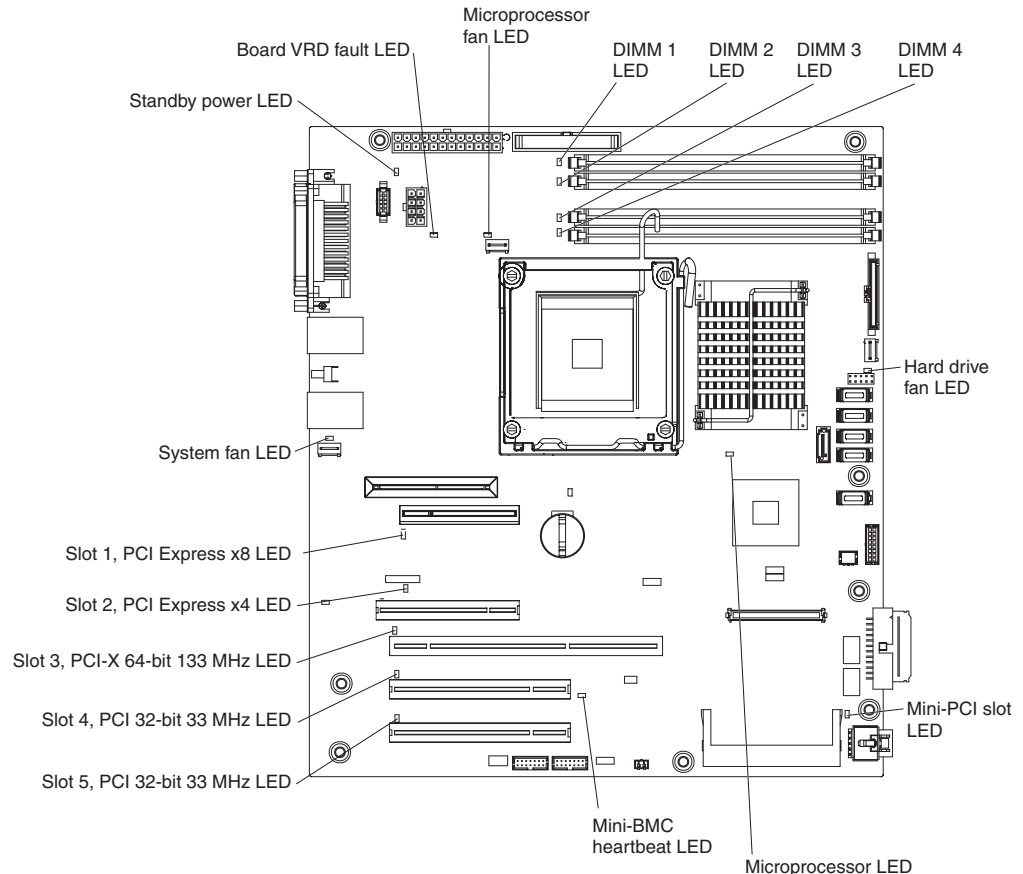
## Universal Serial Bus (USB) device problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See 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.

Symptom	Action
A USB device does not work.	<ol style="list-style-type: none"> <li>1. Run USB diagnostics (see “Running the diagnostic programs” in the <i>Problem Determination and Service Guide</i> on the IBM System x Documentation CD).</li> <li>2. Make sure that: <ul style="list-style-type: none"> <li>• The correct USB device driver is installed.</li> <li>• The operating system supports USB devices.</li> </ul> </li> <li>3. Make sure that the USB configuration options are set correctly in the Configuration/Setup Utility program. (For more information, see the <i>User’s Guide</i> on the IBM System x Documentation CD.)</li> <li>4. If you are using a USB hub, disconnect the USB device from the hub and connect it directly to the server.</li> </ol>

## System-board LEDs

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



Use the system-board LEDs to diagnose system errors. An 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 that the server is restarted; if the problem remains, the LED will be lit again. For additional information, see the *Problem Determination and Service Guide* on the IBM System x Documentation CD.

---

## Appendix A. Getting help and technical assistance

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

---

### Before you call

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the *IBM Documentation CD* that comes with your system.
- Go to the IBM support Web site at <http://www.ibm.com/systems/support/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

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

---

### Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/systems/support/> and follow the instructions. Also, some documents are available through the IBM Publications Center at <http://www.ibm.com/shop/publications/order/>.

---

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

On the World Wide Web, the IBM Web site has up-to-date information about IBM systems, optional devices, services, and support. The address for IBM System x and xSeries® information is <http://www.ibm.com/systems/x/>. The address for IBM BladeCenter® information is <http://www.ibm.com/systems/bladecenter/>. The address for IBM IntelliStation® information is <http://www.ibm.com/intellistation/>.

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

---

## Software service and support

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

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

---

## Hardware service and support

You can receive hardware service through your IBM reseller or IBM Services. To locate a reseller authorized by IBM to provide warranty service, go to <http://www.ibm.com/partnerworld/> and click **Find a Business Partner** on the right side of the page. For IBM support telephone numbers, see <http://www.ibm.com/planetwide/>. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

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

---

## IBM Taiwan product service

台灣 IBM 產品服務聯絡方式：  
台灣國際商業機器股份有限公司  
台北市松仁路7號3樓  
電話：0800-016-888

IBM Taiwan product service contact information:  
IBM Taiwan Corporation  
3F, No 7, Song Ren Rd.  
Taipei, Taiwan  
Telephone: 0800-016-888



---

## Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

*IBM Director of Licensing  
IBM Corporation  
North Castle Drive  
Armonk, NY 10504-1785  
U.S.A.*

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product, and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

---

## Trademarks

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

Active Memory	IBM	TechConnect
Active PCI	IBM (logo)	Tivoli
Active PCI-X	IntelliStation	Tivoli Enterprise
AIX	NetBAY	Update Connector
Alert on LAN	Netfinity	Wake on LAN

BladeCenter	Predictive Failure Analysis	XA-32
Chipkill	ServeRAID	XA-64
e-business logo	ServerGuide	X-Architecture
@server	ServerProven	XpandOnDemand
FlashCopy	System x	xSeries
i5/OS		

Intel, Intel Xeon, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation in the United States, other countries, or both.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States, other countries, or both.

Adobe and PostScript are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Adaptec and HostRAID are trademarks of Adaptec, Inc., in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Red Hat, the Red Hat "Shadow Man" logo, and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc., in the United States and other countries.

Other company, product, or service names may be trademarks or service marks of others.

---

## Important notes

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

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

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

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

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

IBM makes no representation or warranties regarding non-IBM products and services that are ServerProven<sup>®</sup>, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

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

---

## Particulate contamination

**Attention:** Airborne particulates (including metal flakes or particles) and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server that is described in this document. Risks that are posed by the presence of excessive particulate levels or concentrations of harmful gases include damage that might cause the server to malfunction or cease functioning altogether. This specification sets forth limits for particulates and gases that are intended to avoid such damage. The limits must not be viewed or used as definitive limits, because numerous other factors, such as temperature or moisture content of the air, can influence the impact of particulates or environmental corrosives and gaseous contaminant transfer. In the absence of specific limits that are set forth in this document, you must implement practices that maintain particulate and gas levels that are consistent with the protection of human health and safety. If IBM determines that the levels of particulates or gases in your environment have caused damage to the server, IBM may condition provision of repair or replacement of servers or parts on implementation of appropriate remedial measures to mitigate such environmental contamination. Implementation of such remedial measures is a customer responsibility.

*Table 14. Limits for particulates and gases*

Contaminant	Limits
Particulate	<ul style="list-style-type: none"><li>• The room air must be continuously filtered with 40% atmospheric dust spot efficiency (MERV 9) according to ASHRAE Standard 52.2<sup>1</sup>.</li><li>• Air that enters a data center must be filtered to 99.97% efficiency or greater, using high-efficiency particulate air (HEPA) filters that meet MIL-STD-282.</li><li>• The deliquescent relative humidity of the particulate contamination must be more than 60%<sup>2</sup>.</li><li>• The room must be free of conductive contamination such as zinc whiskers.</li></ul>
Gaseous	<ul style="list-style-type: none"><li>• Copper: Class G1 as per ANSI/ISA 71.04-1985<sup>3</sup></li><li>• Silver: Corrosion rate of less than 300 Å in 30 days</li></ul>

Table 14. Limits for particulates and gases (continued)

Contaminant	Limits
	<sup>1</sup> ASHRAE 52.2-2008 - <i>Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size</i> . Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
	<sup>2</sup> The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.
	<sup>3</sup> ANSI/ISA-71.04-1985. <i>Environmental conditions for process measurement and control systems: Airborne contaminants</i> . Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.

---

## Documentation format

The publications for this product are in Adobe Portable Document Format (PDF) and should be compliant with accessibility standards. If you experience difficulties when you use the PDF files and want to request a Web-based format or accessible PDF document for a publication, direct your mail to the following address:

*Information Development  
IBM Corporation  
205/A015  
3039 E. Cornwallis Road  
P.O. Box 12195  
Research Triangle Park, North Carolina 27709-2195  
U.S.A.*

In the request, be sure to include the publication part number and title.

When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

---

## Electronic emission notices

### Federal Communications Commission (FCC) statement

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

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

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

## **Industry Canada Class A emission compliance statement**

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

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

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

## **Australia and New Zealand Class A statement**

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

## **United Kingdom telecommunications safety requirement**

### **Notice to Customers**

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

## **European Union EMC Directive conformance statement**

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

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

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

European Community contact:

IBM Technical Regulations  
Pascalstr. 100, Stuttgart, Germany 70569  
Telephone: 0049 (0)711 785 1176  
Fax: 0049 (0)711 785 1283  
E-mail: tjahn@de.ibm.com

## Taiwanese Class A warning statement

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

## Germany Electromagnetic Compatibility Directive

### Deutschsprachiger EU Hinweis:

#### Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden: "Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

#### Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

#### Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen. Verantwortlich für die Konformitätserklärung des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.

#### Generelle Informationen:

**Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.**

## People's Republic of China Class A warning statement

### 声 明

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

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

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A

## Korean Class A warning statement

이 기기는 업무용으로 전자파 적합등록을 받은 기기 이오니, 판매자 또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에서 비업무용으로 교환하시기 바랍니다.





# Index

## A

- AC power LED 39
- accessible documentation 78
- acoustical noise emissions 6, 7
- adapter
  - installing 30
  - requirements 28
  - scanning order 29
  - specifications 6
  - support bracket 8
- assistance, getting 73
- attention notices 5

## B

- backplane 24, 25
- battery
  - safety viii
- bay identification 19
- bays 2 and 3, removable-media drives 20
- bays 4-7
  - hot-swap drives 24
- bays, filler panel 20, 22
- beep codes 47
- bezel
  - installing 32
  - removing 13
- Boot Menu
  - using 44
- Broadcom NetXtreme Gigabit Ethernet Boot Agent
  - enabling 44

## C

- cables
  - internal drives 28
  - power 28
  - rear connectors 35
  - signal 28
- caution statements 5
- CD drive
  - activity LED 38
  - eject button 38
  - installing 19
  - problems 59
  - specifications 6
- CD or DVD drive
  - installing 20
- Class A electronic emission notice 78
- components, major 8
- configuration
  - updating 36
- Configuration/Setup Utility program 44
- configuring
  - the Ethernet controller 45
  - the server 43

- connector
  - cable 35
  - Ethernet 39
  - Ethernet Remote Supervisor Adapter II SlimLine 40
  - external 38, 39
  - parallel 39
  - power cord 39
  - serial 1 39
  - serial 2 39
  - Universal Serial Bus (USB) 38, 39
  - video 39
- contamination, particulate and gaseous 77
- controller
  - Ethernet 45
- controls and indicators 37
- cooling 7, 10
- cover
  - installing 34
  - removing 12

## D

- danger statements 5
- data rate, Ethernet controller 45
- diagnostic tools 47
- diskette drive
  - activity LED 38
  - installing 19, 22
  - problems 60
  - specifications 6
- diskette-eject button 38
- documentation CD 4
- documentation format 78
- drive
  - bay filler panel 20, 22
  - bay identification 19
  - cables 28
  - hot-swap
    - installation 23
    - support 19
  - installing 19
  - removable-media 20, 22
  - simple-swap 26
- drive, hot-swap
  - installation sequence 24
- dual inline memory module (DIMM)
  - connectors 17
  - installing 17
  - retaining clips 18
- DVD drive
  - activity LED 38
  - eject button 38
  - problems 59

## E

- eject button
  - CD 38
  - diskette 38
  - DVD 38
- electrical input 6, 7
- electromagnetic compatibility (EMC) shield 8, 20, 21, 22, 23
- electronic emission Class A notice 78
- enabling
  - Broadcom NetXtreme Gigabit Ethernet Boot Agent 44
- environment 6, 7
- error LED 71
- error messages, POST 48
- error symptoms
  - CD-ROM drive, DVD-ROM drive 59
  - general 60
  - hard disk drive 60
  - intermittent 61
  - keyboard 62
  - keyboard, USB 71
  - memory 63
  - microprocessor 64
  - mouse 62
  - mouse, USB 71
  - optional devices 67
  - pointing device 62
  - pointing device, USB 71
  - power 68
  - serial port 69
  - software 70
  - USB port 62, 71
- Ethernet
  - activity LED 40
  - connector 39
  - high performance modes 45
  - integrated on system board 45
  - link status LED 40
  - modes 45
  - Remote Supervisor Adapter II SlimLine connector 40
  - teaming 45
- Ethernet controller
  - configuring 45
- Ethernet controller, configuring 45
- expansion slots 7, 29, 31
- external connectors 39

## F

- FCC Class A notice 78
- features
  - server 6
- filler panel
  - hard disk drive bay 8
  - removable-media drive bay 8, 21, 23
  - removing 20, 22
  - SAS 8
  - SATA 8

## G

- gaseous contamination 77
- getting help 73

## H

- handling static-sensitive devices 11
- hard disk drive
  - activity LED 37, 38
  - hot-swap 23
  - installing 19
  - order of installation 26
  - problems 60
  - simple-swap 26
  - status LED 38
- hardware service and support 74
- heat output 6, 7
- help, getting 73
- hot-swap drive
  - backplane
    - activity LED 38
    - SAS IDs 25
    - status LED 38
  - installation 23
  - specifications 6

## I

- IBM Support Line 74
- IDs for SAS hot-swap drives 25
- important notices 5
- indicators 37
- installation guidelines 9
- installation order
  - hard disk drives 26
  - memory modules 15, 17
- installing
  - adapters 30
  - CD or DVD drive 20
  - cover 34
  - hot-swap drives 23, 24
  - internal drives 19
  - lower bezel 33
  - memory modules 15
  - optional devices 9
  - removable-media drives 19
  - simple-swap drives 26
  - tape drive 22
  - upper bezel 32
- intermittent problems 61
- internal
  - drives, installing 19

## K

- keyboard problems 62, 71
- keys 3
  - to the server
    - location of 3

## L

### LED

AC power 39

### LEDs

CD drive activity 38

diskette drive activity 38

DVD drive activity 38

error 71

Ethernet link status 40

Ethernet transmit/receive activity 40

hard disk drive activity 37

hot-swap hard disk drive activity 38

hot-swap hard disk drive status 38

power-on 37

system-error 37

### location

of the server keys 3

### lower bezel

installing 33

removing 13

### LSI Configuration

using 46

LSI Configuration program 45

## M

major components 8

### memory

installing 15

problems 63

specifications 6

### memory module

installing 17

order of installation 15, 17

specifications 7

supported 15

### microprocessor

problems 64

specifications 6, 7

modes, Ethernet 45

mouse problems 62, 71

## N

notes 5

notes, important 76

notices 75

electronic emission 78

FCC, Class A 78

notices and statements 5

## O

online publications 1

### optional device

installation guidelines 9

problems 67

static-sensitive 11

### optional devices

adapters 29, 30

### optional devices *(continued)*

connectors 39

drives 19

installing 9

memory modules 15

### order of installation

hard disk drives 26

memory modules 15, 17

## P

parallel connector 39

particulate contamination 77

pointing-device problems 62, 71

### ports

Ethernet 39

parallel 39

serial 1 39

serial 2 39

Universal Serial Bus (USB) 38, 39, 71

video 39

power control-button 37

power problems 68

### power supply

specifications 7

power-cord connector 39

power-on LED 37

power-on self-test (POST)

beep codes 47

error messages 48

### problems

CD-ROM, DVD-ROM drive 59

diskette drive 60

hard disk drive 60

intermittent 61

keyboard 62, 71

memory 63

microprocessor 64

mouse 62, 71

optional devices 67

pointing device 62, 71

power 68

serial port 69

software 70

solving 47

USB port 71

## R

### RAID adapter

slot 29

### redundant array of independent disks (RAID)

adapter 25

reliability, system 10

removable-media drives, installing 19, 20

### removing

cover 12

lower bezel 13

upper bezel 14

retaining clips, dual inline memory module (DIMM) 18

## S

- safety information
  - handling static-sensitive devices 11
  - introduction vi
  - multilingual pointer v
  - statements vii
  - system reliability considerations 10
  - when the server is on 11
- scanning order for adapters 29
- serial 1 connector 39
- serial 2 connector 39
- Serial Advanced Technology Attachment (SATA)
  - hot-swap drives 23, 24
  - simple-swap drives 26
  - status LEDs for hot-swap drives 38
- Serial Attached SCSI (SAS)
  - activity LEDs for hot-swap drives 38
  - backplane
    - activity LEDs for hot-swap drives 38
    - description 24
    - IDs for hot-swap drives 25
    - status LEDs for hot-swap drives 38
  - hot-swap drives 23, 24
  - status LEDs for hot-swap drives 38
- serial port problems 69
- server
  - configuring 43
  - features 6
  - power features 40
  - specifications 6
- server keys
  - location 3
- ServerGuide
  - CDs 1
- simple-swap drives 26
- size 7
- software problems 70
- software service and support 74
- solving problems 47
- specifications 6
- starting
  - Configuration/Setup Utility program 44
- statements and notices 5
- static electricity 11
- static-sensitive devices, handling 11
- status LEDs 37
- support, web site 73
- system board
  - LEDs 71
  - memory connectors 17
- system reliability 10
- system specifications 6
- system-error LED 37

## T

- tape drive, installing 19
- telephone numbers 74
- temperature 6
- trademarks 75

- troubleshooting chart 58
- two-piece bezel 13, 32

## U

- United States electronic emission Class A notice 78
- United States FCC Class A notice 78
- Universal Serial Bus (USB)
  - connectors
    - front 38
    - rear 39
  - problems 62, 71
- upper bezel
  - installing 32
  - removing 14
- using
  - Boot Menu program 44
  - LSI Configuration 46
- utility program
  - Configuration/Setup 44
- Utility program
  - Configuration/Setup 44

## V

- video
  - connector 39
  - controller 7
  - specifications 6

## W

- web site
  - publication ordering 73
  - support 73
  - support line, telephone numbers 74
- Web site
  - compatible optional devices 3, 10, 15
  - IBM eServer and System products 1
  - IBM support 1
  - ServerProven list 3, 10, 15
- weight 6, 7





Part Number: 46M2038

Printed in USA

(1P) P/N: 46M2038

