



IBM System x3105 Type 4347

Problem Determination and Service Guide







IBM System x3105 Type 4347

Problem Determination and Service Guide

**Note:**

Before using this information and the product it supports, read the general information in Appendix B, "Notices," on page 99 and the *Warranty and Support Information* document on the IBM *System x* Documentation CD.

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## Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

在安裝本產品之前，請仔細閱讀 **Safety Information** (安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

---

## Guidelines for trained service technicians

This section contains information for trained service technicians.

### Inspecting for unsafe conditions

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

Consider the following conditions and the safety hazards that they present:

- Electrical hazards, especially primary power. Primary voltage on the frame can cause serious or fatal electrical shock.
- Explosive hazards, such as a damaged CRT face or a bulging capacitor.
- Mechanical hazards, such as loose or missing hardware.

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

1. Make sure that the power is off and the power cord is disconnected.
2. Make sure that the exterior cover is not damaged, loose, or broken, and observe any sharp edges.
3. Check the power cord:
  - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
  - Make sure that the power cord is the correct type, as specified in "Power cords" on page 56.
  - Make sure that the insulation is not frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

### Guidelines for servicing electrical equipment

Observe the following guidelines when servicing electrical equipment:

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

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

---

## Safety statements

### Important:

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

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

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

**Statement 1:**



**DANGER**

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

**To avoid a shock hazard:**

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

**To Connect:**

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

**To Disconnect:**

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

**Statement 2:**



**CAUTION:**

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

*Do not:*

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

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

**Statement 3:**



**CAUTION:**

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

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



**DANGER**

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

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



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

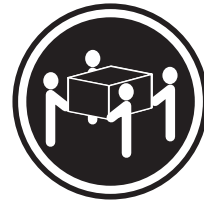
**Statement 4:**



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

**CAUTION:**

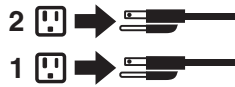
Use safe practices when lifting.

**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.

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

**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.



---

## Chapter 1. Introduction

This *Problem Determination and Service Guide* contains information to help you solve problems that might occur in your IBM® System x3105 Type 4347 server. It describes the diagnostic tools that come with the server, error codes and suggested actions, and instructions for replacing failing components.

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

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

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## Related documentation

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

- *Installation Guide*

This printed document contains instructions for setting up the server and basic instruction for installing some optional devices.

- *User's Guide*

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

- *Rack Installation Instructions*

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

- *Safety Information*

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

- *Warranty and Support Information*

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

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

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

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

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

1. Go to [www.ibm.com/servers/eserve/support/xseries/index.html](http://www.ibm.com/servers/eserve/support/xseries/index.html).
2. From the **Hardware** list, select **System x3105** and click **Go**.
3. Click the **Install and use** tab.
4. Click **Product documentation**.

---

## 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 could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

## Features and specifications

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

Table 1. Features and specifications

<p><b>Microprocessor:</b></p> <ul style="list-style-type: none"> <li>• AMD single-core Athlon processor or dual-core Opteron processor</li> <li>• 512 KB or 2 MB (1 MB per core) level-2 cache</li> <li>• 1000 MHz Hyper-transport (HT) interface</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: Unbuffered PC2-5300, double-data-rate 2 (DDR2) 667 MHz with ECC</li> <li>• Connectors: four dual inline memory module (DIMM) connectors, two-way interleaved</li> </ul> <p><b>Drives:</b> (depending on your model)</p> <ul style="list-style-type: none"> <li>• Diskette: (optional) 1.44 MB</li> <li>• Hard disk drive: SATA</li> <li>• Optional tape drive: SATA</li> <li>• One of the following IDE drives: <ul style="list-style-type: none"> <li>– CD-ROM</li> <li>– CD-RW (optional)</li> <li>– DVD-ROM (optional)</li> <li>– DVD/CD-RW combo (optional)</li> </ul> </li> </ul> <p><b>Drive bays:</b> (depending on your model)</p> <ul style="list-style-type: none"> <li>• Two 5.25 in. bays (one CD or DVD drive installed)</li> <li>• One 3.5 in. removable-media drive bay; optional internal diskette drive</li> <li>• Two 3.5 in. hard disk drive bays (one hard disk drive installed)</li> </ul> <p><b>Expansion slots:</b></p> <ul style="list-style-type: none"> <li>• Two PCI Express x8 slots</li> <li>• Two PCI 33 MHz/32-bit slots</li> </ul> <p><b>Video controller:</b> ATI ES1000 video controller with 16 MB SDRAM video memory on the system board</p> <p><b>Fans:</b> One speed-controlled fan</p>	<p><b>Power supply:</b> One 310 watt (90 - 240 V ac)</p> <p><b>Important:</b> Make sure that the ac power-supply input voltage is set to the correct level (at 115 V ac or 230 V ac) for your geographic location before you turn on the server.</p> <p><b>Size:</b></p> <ul style="list-style-type: none"> <li>• Height: 420 mm (16.54 in.)</li> <li>• Depth: 448 mm (17.64 in.)</li> <li>• Width: 175 mm (6.89 in.)</li> <li>• Weight: 14 kg (31 lb) to 17 kg (37.48 lb) depending upon configuration</li> </ul> <p><b>Integrated functions:</b></p> <ul style="list-style-type: none"> <li>• Broadcom 5721 10/100/1000 Ethernet controller on the system board with RJ-45 Ethernet port</li> <li>• One serial ports</li> <li>• One parallel port</li> <li>• Two-port Serial ATA controller</li> <li>• Six Universal Serial Bus (USB) v2.0 ports (two on front and four on rear)</li> <li>• ATA-100 single-channel IDE controller</li> <li>• ATI ES1000 video <ul style="list-style-type: none"> <li>– Compatible with SVGA and VGA</li> <li>– 16 MB video memory</li> </ul> </li> </ul> <p><b>Diagnostic LEDs:</b></p> <ul style="list-style-type: none"> <li>• Fans</li> <li>• Memory</li> </ul> <p><b>Acoustical noise emissions:</b></p> <ul style="list-style-type: none"> <li>• Sound power, idling: 4.3 bel</li> <li>• Sound power, operating: 4.8 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 m (2998.0 ft)</li> <li>– Server off: 0° to 60°C (-32° to 140°F)</li> <li>Altitude: 0 to 2133 m (7000.0 ft)</li> </ul> </li> <li>• Humidity (operating and storage): 8% to 80%</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: 185 Btu per hour (54 watts)</li> <li>• Maximum configuration: 853 Btu per hour (250 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 manually 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: 0.10 kVA (all models)</li> <li>– Maximum: 0.50 kVA</li> </ul> </li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. Power consumption and heat output vary depending on the number and type of optional features that are installed and the power-management optional features that are in use.</li> <li>2. These levels were measured in controlled acoustical environments according to the procedures that are specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779 and are reported in accordance with ISO 9296. Actual sound-pressure levels in a given location might exceed the average values stated because of room reflections and other nearby noise sources. The declared sound-power levels indicate an upper limit, below which a large number of servers will operate.</li> </ol>
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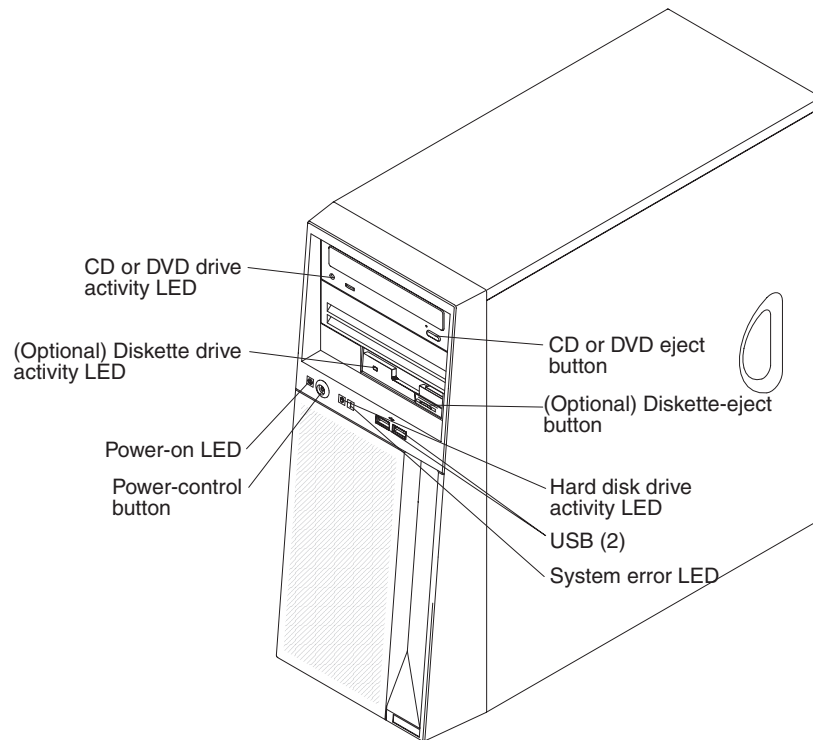
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## Server controls, LEDs, and connectors

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

### Front view

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



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

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

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

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

#### **Hard disk drive activity LED**

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

#### **USB connectors**

Connect a USB device to these connectors.

#### **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.

#### **Power-control button**

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

#### **Power-on LED**

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

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

**(Optional) Diskette drive activity LED**

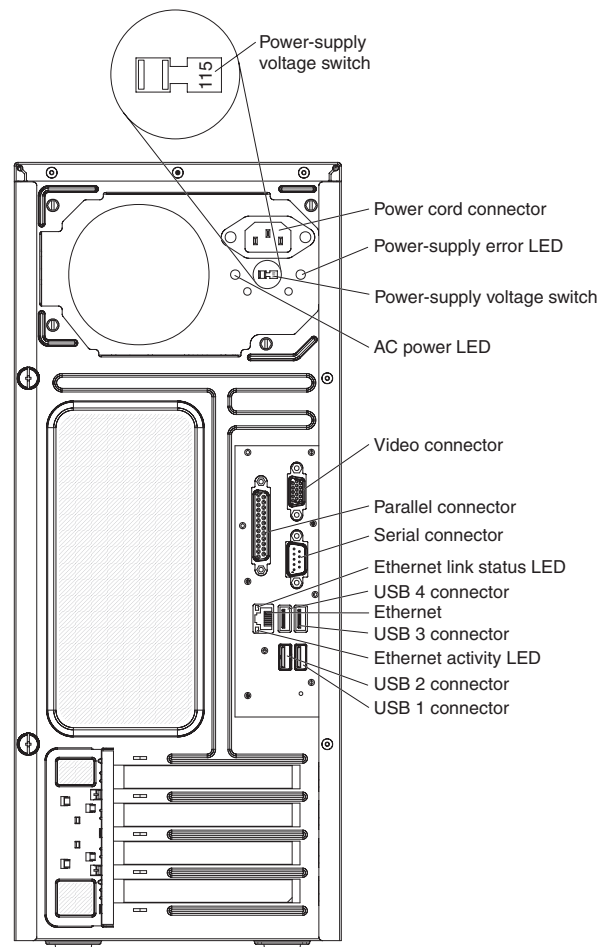
When this LED is lit, it indicates that the diskette drive is in use.

**CD or DVD drive activity LED**

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

## 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.

**Power-supply error LED**

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

**Power supply voltage switch**

Use this switch to change the system ac power-supply input voltage for your geographic location. Set the input voltage to the correct level (115 volts ac or 230 volts ac) based on your power requirements before you turn on the server.

**AC power LED**

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

**Video connector**

Connect a monitor to this connector.

**Parallel connector**

Connect a parallel device to this connector.

**Serial connector**

Connect a 9-pin serial device to this connector.

**Ethernet link status LED**

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

**USB connectors**

Connect USB devices to these connectors.

**Ethernet connector**

Use this connector to connect the server to a network.

**Ethernet activity LED**

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



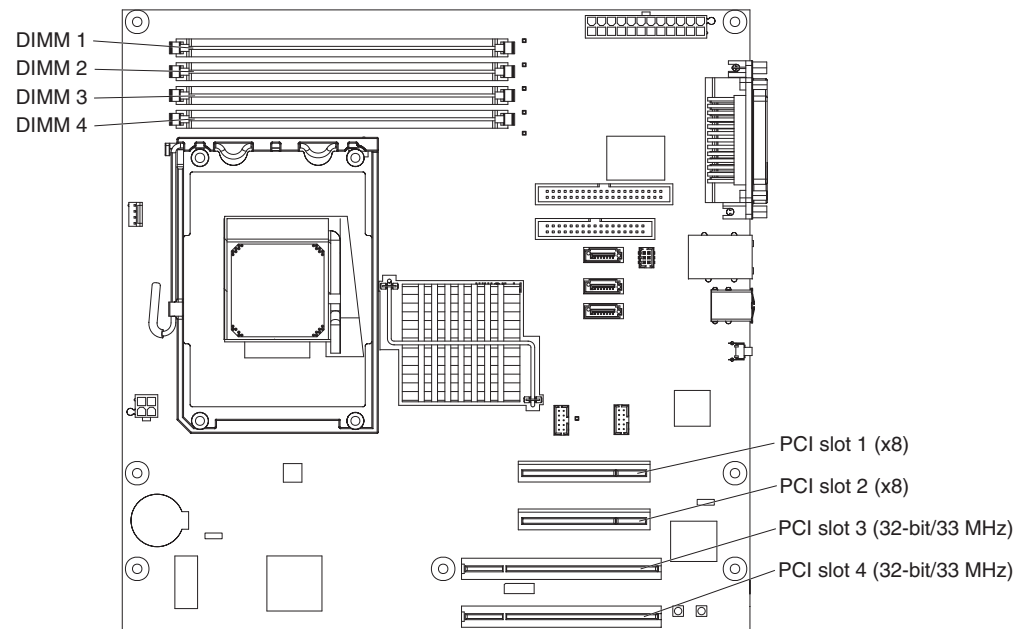
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## Internal LEDs, connectors, and jumpers

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

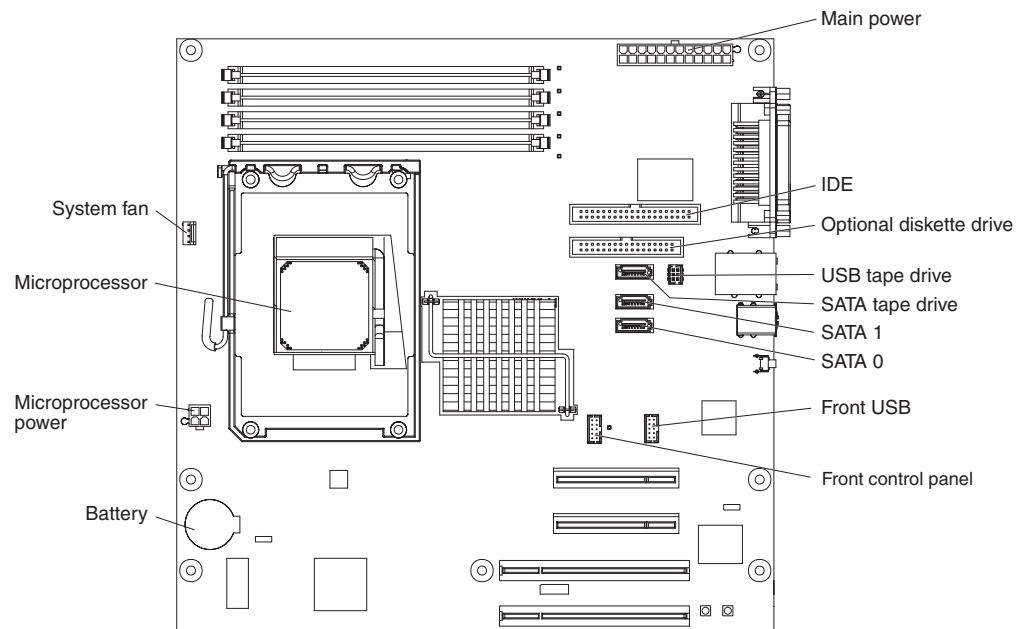
### System-board optional-device connectors

The following illustration shows the optional-device connectors on the system board.



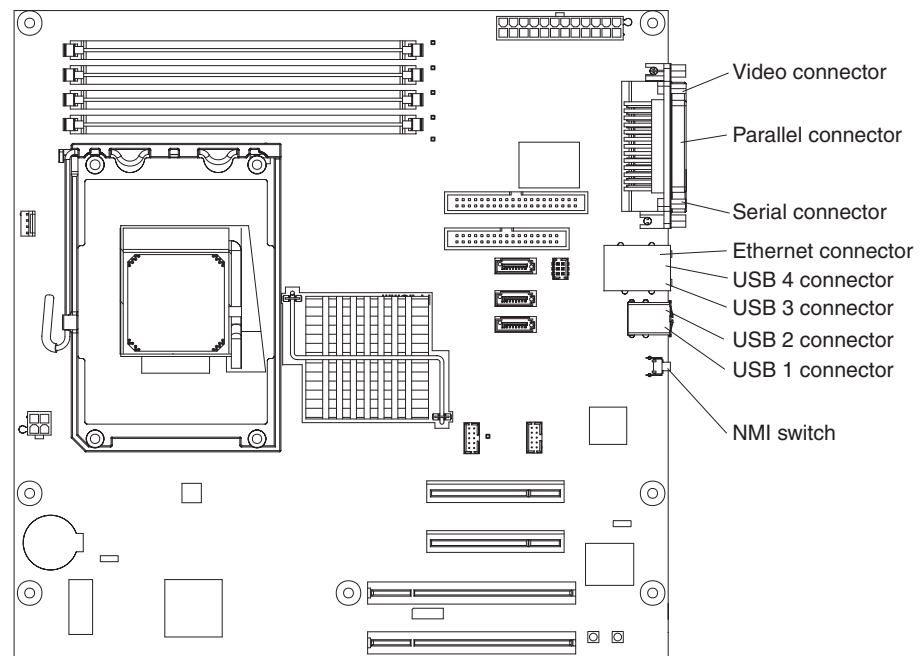
## System-board internal connectors

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



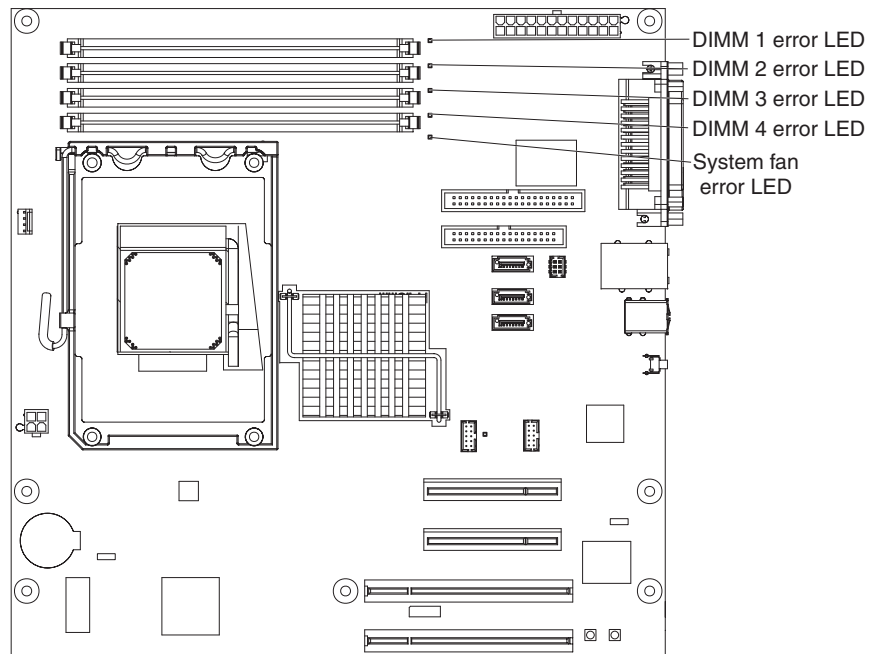
## System-board external connectors

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



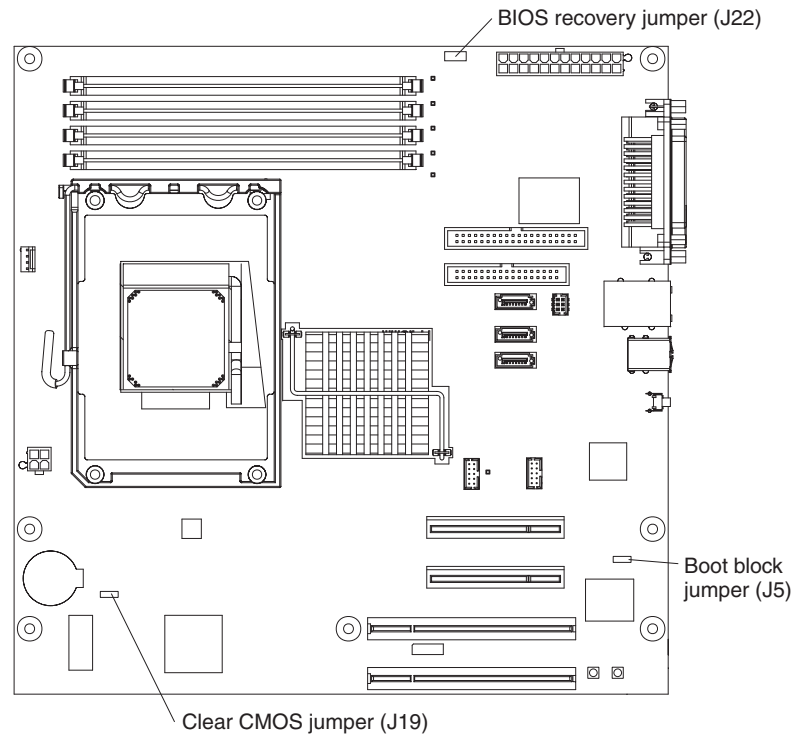
## System-board LEDs

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



## System-board jumpers

The following illustration shows the jumper blocks on the system board.



Any jumper blocks on the system board that are not shown in the illustration are reserved. The following table describes the function of each jumper block.

Table 2. System-board jumper blocks

Jumper name	Description
Boot block (J5)	<ul style="list-style-type: none"><li>• Pins 1 and 2: Normal (default)</li><li>• Pins 2 and 3: Recover BIOS (see “Recovering from a BIOS update failure” on page 46).</li></ul>
Clear CMOS (J19)	<ul style="list-style-type: none"><li>• Pins 1 and 2: Clear the CMOS data, which clears the power-on password and the administration password.</li><li>• Pins 2 and 3: Keep CMOS data (default)</li></ul>
BIOS recovery (J22)	<ul style="list-style-type: none"><li>• Pins 1 and 2: Normal (default)</li><li>• Not installed (removed): BIOS recovery</li></ul>



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## Chapter 2. Diagnostics

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

If you cannot diagnose and correct the problem by using the information in this chapter, see Appendix A, “Getting help and technical assistance,” on page 97 for more information.

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### Diagnostic tools

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

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

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

- **Troubleshooting tables**

These tables list problem symptoms and actions to correct the problems. See “Troubleshooting tables” on page 28.

- **System-board error LEDs**

When the system-error LED on the front of the server is lit, an LED on the system board might also be lit to help isolate an error. See “System-board LEDs” on page 10 for more information.

- **Diagnostic programs, messages, and error messages**

The diagnostic programs are the primary method of testing the major components of the server. The diagnostic programs are on the *IBM Enhanced Diagnostics* CD. See “Diagnostic programs, messages, and error codes” on page 40 for more information.

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### POST

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

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

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

If POST detects a problem, several beeps might sound, or an error message is displayed. See “POST beep codes” and “POST error codes” on page 16 for more information.

### POST beep codes

A beep code is a combination of short or long beeps or series of short beeps that are separated by pauses. For example, a “1-2-3” beep code is one short beep, a pause, two short beeps, and pause, and three short beeps. A beep code indicates that POST has detected a problem. To determine the meaning of a beep code, see “Beep code descriptions” on page 14.

## Beep code descriptions

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

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

**Exception:** If there are multiple error codes that indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See "Microprocessor problems" on page 32 for information about diagnosing 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 Chapter 3, "Parts listing, System x3105 Type 4347," on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li><li>• If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.</li></ul>		
Beep code	Description	Action
1-1-3	CMOS write/read test failed.	<ol style="list-style-type: none"><li>1. Reseat the 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>
1-1-4	BIOS ROM checksum failed.	<ol style="list-style-type: none"><li>1. Recover the BIOS code.</li><li>2. (Trained service technician only) Replace the system board.</li></ol>
1-2-1	Programmable interval timer failed.	(Trained service technician only) Replace the system board.
1-2-2	DMA initialization failed.	(Trained service technician only) Replace the system board.
1-2-3	DMA page register write/read failed.	(Trained service technician only) Replace the system board.
1-2-4	RAM refresh verification failed.	<ol style="list-style-type: none"><li>1. Reseat the DIMMs.</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. DIMMs</li><li>b. (Trained service technician only) System board</li></ol></li></ol>
1-3-1	First 64 K RAM test failed.	<ol style="list-style-type: none"><li>1. Reseat the DIMMs.</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. DIMMs</li><li>b. (Trained service technician only) System board</li></ol></li></ol>



<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>		
Beep code	Description	Action
2-1-1	Secondary DMA register failed.	(Trained service technician only) Replace the system board.
2-1-2	Primary DMA register failed.	(Trained service technician only) Replace the system board.
2-1-3	Primary interrupt mask register failed.	(Trained service technician only) Replace the system board.
2-1-4	Secondary interrupt mask register failed.	(Trained service technician only) Replace the system board.
2-2-2	Keyboard controller failed.	<ol style="list-style-type: none"> <li>1. Reseat the keyboard cable.</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. Keyboard</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
3-3-2	Critical SMBUS error occurred.	<ol style="list-style-type: none"> <li>1. Disconnect the power cord, wait 30 seconds, and retry.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. DIMMs</li> <li>b. (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. DIMMs</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
3-3-3	<p>No operational memory in system.</p> <p><b>Important:</b> In some memory configurations, the 3-3-3 beep code might sound during POST followed by a blank display screen. If this occurs and the <b>Boot Fail Count</b> feature in the <b>Startup Option</b> menu of the Configuration/Setup Utility program is set to <b>Enabled</b> (its default setting), you must restart the server three times to force the system BIOS to reset the memory connector from <b>Disabled</b> to <b>Enabled</b>.</p>	<ol style="list-style-type: none"> <li>1. If you just installed memory, make sure that the new memory is correct for your server and that you have installed the correct number of DIMMs (see the <i>User's Guide</i> for information about installing optional memory modules).</li> <li>2. Reseat the DIMMs.</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. DIMMs</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>

## Error logs

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

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

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

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

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

To view the error logs, complete the following steps:

1. Turn on the server.
2. When the prompt Press F1 for Configuration/Setup is displayed, press F1.
3. Select **Error Logs**.
4. Use one of the following procedures:
  - To view the POST error log, select **POST Error Log**.
  - To view the system-event/error log, select **System Event/Error Log**.

## POST error codes

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

<ul style="list-style-type: none"><li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li><li>• See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 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 “Updating the firmware” on page 93).</li><li>2. (Trained service technician only) Replace the system board.</li></ol>
101, 102	Tick timer internal interrupt, internal timer channel 2.	(Trained service technician only) Replace the system board.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
106	A diskette controller failure occurred.	<ol style="list-style-type: none"> <li>1. Make sure that the Configuration/Setup Utility program correctly reflects the type of diskette drive that is installed.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Diskette drive cable</li> <li>b. Diskette drive</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. Diskette drive cable</li> <li>b. Diskette drive</li> <li>c. (Trained service technician) 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>
161	Real-time clock battery error occurred.	<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	Device configuration error occurred.	<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 replaced 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>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
163	Real-time clock error occurred.	<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. 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 configuration changed.	<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 DIMMs.</li> <li>3. Replace the following components one at a time, in the order shown, restating 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>
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. 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 is not set.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility Program, set the serial number, and save the configuration.</li> <li>2. (Trained service technician only) Replace the system board.</li> </ol>
189	An attempt was made to access the server with an incorrect password.	Restart the server and enter the administrator password; then, run the Configuration/Setup Utility program and change the power-on password.
289	A DIMM has been disabled by the user or by the system.	<ol style="list-style-type: none"> <li>1. If the DIMM was disabled by the user, run the Configuration/Setup Utility program and enable the DIMM.</li> <li>2. Make sure that the DIMM is installed correctly (see “Removing a memory module” on page 67).</li> <li>3. Reseat the DIMM.</li> <li>4. Replace the DIMM.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
301	Keyboard or keyboard controller error occurred.	<ol style="list-style-type: none"> <li>1. If you have installed a USB keyboard, run the Configuration/Setup Utility program and enable keyboardless operation to prevent this error message from being displayed during startup.</li> <li>2. Reseat the keyboard 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. Keyboard</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
303	A keyboard controller error occurred.	<ol style="list-style-type: none"> <li>1. Reseat the keyboard cable.</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. Keyboard</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
602	An invalid diskette boot record error occurred.	<ol style="list-style-type: none"> <li>1. Reseat the diskette drive cable.</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. Diskette drive cable</li> <li>b. Diskette drive</li> <li>c. (Trained service technician only) System board</li> </ol> </li> </ol>
604	An error occurred during a diskette drive test.	<ol style="list-style-type: none"> <li>1. Make sure that the Configuration/Setup Utility program correctly reflects the type of diskette drive that is installed.</li> <li>2. Reseat the diskette drive 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. Diskette drive cable</li> <li>b. Diskette drive</li> <li>c. (Trained service technician only) System board</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
662	A diskette drive configuration error occurred.	<ol style="list-style-type: none"> <li>1. Make sure that the Configuration/Setup Utility program correctly reflects the type of diskette drive that is installed.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Diskette drive cable</li> <li>b. Diskette drive</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. Diskette drive cable</li> <li>b. Diskette drive</li> <li>c. (Trained service technician) System board</li> </ol> </li> </ol>
962	A parallel port configuration error occurred.	<ol style="list-style-type: none"> <li>1. If you changed an optional hardware device, make sure that the parallel port setting is correct in the Configuration/Setup Utility program. If the setting is not correct, change it and save the settings.</li> <li>2. (Trained service technician only) Replace the system board.</li> </ol>
1162	The serial port configuration conflicts with another device in the system.	<ol style="list-style-type: none"> <li>1. Make sure that the interrupt request (IRQ) and I/O port assignments that are needed by the serial port are available.</li> <li>2. If all interrupts are being used by adapters, remove an adapter to make an interrupt available to the serial port, or force other adapters to share an interrupt.</li> <li>3. Make sure that the serial port setting is correct in the Configuration/Setup Utility program. If the setting is not correct, change it and save the settings.</li> <li>4. (Trained service technician only) Replace the system board.</li> </ol>
1762	Fixed disk configuration error occurred.	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program and load the defaults.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. 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 components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
178x	A fixed disk error has occurred.	<ol style="list-style-type: none"> <li>1. Reseat the hard disk drive cable.</li> <li>2. Replace the hard disk drive cable.</li> <li>3. Run the hard disk drive diagnostic tests.</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. Hard disk drive</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
1801	A PCI 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 or PCI Express slots. Make sure that the startup (boot) device is positioned early in the scan order. (For information about the scanning order, see the <i>User's Guide</i> on the <i>IBM System x Documentation CD</i>.)</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 might 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. Make sure that the settings for the adapter and all other adapters in the Configuration/Setup Utility program are correct.</li> <li>2. If the error code indicates a particular PCI or PCI Express slot or device, remove that device.</li> <li>3. Reseat each adapter.</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. Adapter</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
1803	No more memory (above 1 MB for a PCI or PCI Express adapter).	<ol style="list-style-type: none"> <li>1. Make sure that the settings for the adapter and all other adapters in the Configuration/Setup Utility program are correct.</li> <li>2. If the error code indicates a particular PCI or PCI Express slot or device, remove that device.</li> <li>3. Reseat each adapter.</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. Adapter</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
1804	No more memory (below 1 MB for a PCI or PCI Express adapter).	<ol style="list-style-type: none"> <li>1. Make sure that the settings for the adapter and all other adapters in the Configuration/Setup Utility program are correct.</li> <li>2. If the error code indicates a particular PCI or PCI Express slot or device, remove that device.</li> <li>3. Reseat each adapter.</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. 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 adapter</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
1806	PCI built-in self-test (BIST) failure occurred.	<ol style="list-style-type: none"> <li>1. Make sure that the settings for the adapter and all other adapters in the Configuration/Setup Utility program are correct.</li> <li>2. If the error code indicates a particular PCI or PCI Express slot or device, remove that device.</li> <li>3. Reseat each adapter.</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. Adapter</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>



- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
1807, 1808	General PCI error occurred.	<ol style="list-style-type: none"> <li>1. Make sure that no devices have been disabled in the Configuration /Setup Utility program.</li> <li>2. Reseat the failing adapter. <b>Note:</b> If an error LED is lit on an adapter, reseat that adapter first; if no LEDs are lit, reseat each adapter one at a time, restarting the server each time to isolate the failing adapter.</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. Adapter</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
1962	A hard disk drive does not contain a valid boot sector.	<ol style="list-style-type: none"> <li>1. Make sure that a bootable operating system is installed.</li> <li>2. Run the hard disk drive diagnostic tests.</li> <li>3. Reseat the hard disk 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. Hard disk drive cable</li> <li>b. Hard disk drive</li> <li>c. (Trained service technician only) System board</li> </ol> </li> </ol>
5962	IDE, CD, or DVD drive configuration error occurred.	<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 94).</li> <li>2. Reseat the CD or DVD drive 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. CD or DVD drive cable</li> <li>b. CD or DVD drive</li> <li>c. (Trained service technician only) System board</li> </ol> </li> </ol>
8603	A pointing-device error occurred.	<ol style="list-style-type: none"> <li>1. Reseat the pointing device cable.</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. Pointing device</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
00012000	A processor machine check error occurred.	<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	Processor failed 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>
01298101	A bad update data for processor error occurred.	<ol style="list-style-type: none"> <li>1. Update the BIOS code again (see “Updating the firmware” on page 93).</li> <li>2. (Trained service technician only) Reseat the microprocessor.</li> <li>3. (Trained service technician only) Replace the microprocessor.</li> </ol>
I9990301	A hard disk drive boot sector error occurred.	<ol style="list-style-type: none"> <li>1. Reseat the hard disk drive cable.</li> <li>2. Reseat the hard disk drive.</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 cable</li> <li>b. Hard disk drive</li> <li>c. (Trained service technician only) System board</li> </ol> </li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
I9990305	An operating system was not found.	<ol style="list-style-type: none"> <li>1. Make sure that a bootable operating system is installed.</li> <li>2. Run the hard disk drive diagnostic tests.</li> <li>3. Reseat the following components: <ol style="list-style-type: none"> <li>a. Hard disk drive</li> <li>b. CD or DVD drive and cables</li> <li>c. (Trained service technician only) System board</li> </ol> </li> <li>4. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li> </ol>
I9990650	The AC power has been restored.	<ol style="list-style-type: none"> <li>1. Reseat the power cord.</li> <li>2. Check for the interruption of the external power.</li> <li>3. Replace the power cord.</li> </ol>

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## Checkout procedure

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

### About the checkout procedure

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

- Read the safety information that begins on page vii.
- The diagnostic programs provide the primary methods of testing the major components of the server, such as the system board, Ethernet controller, keyboard, mouse (pointing device), serial ports, and hard disk drives. You can also use them to test some external devices. If you are not sure whether a problem is caused by the hardware or by the software, you can use the diagnostic programs to confirm that the hardware is working correctly.
- When you run the diagnostic programs, a single problem might cause more than one error message. When this happens, correct the cause of the first error message. The other error messages usually will not occur the next time you run the diagnostic programs.

**Exception:** If there are multiple error codes that indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 32 for information about diagnosing microprocessor problems.

- Before you run the diagnostic programs, you must determine whether the failing server is part of a shared hard disk drive cluster (two or more servers sharing external storage devices). If it is part of a cluster, you can run all diagnostic programs except the ones that test the storage unit (that is, a hard disk drive in the storage unit) or the storage adapter that is attached to the storage unit. The failing server might be part of a cluster if any of the following conditions is true:
  - You have identified the failing server as part of a cluster (two or more servers sharing external storage devices).
  - One or more external storage units are attached to the failing server and at least one of the attached storage units is also attached to another server or unidentifiable device.
  - One or more servers are located near the failing server.

**Important:** If the server is part of a shared hard disk drive cluster, run one test at a time. Do not run any suite of tests, such as “quick” or “normal” tests, because this might enable the hard disk drive diagnostic tests.

- If the server is halted and a POST error code is displayed, see “Error logs” on page 16. If the server is halted and no error message is displayed, see “Troubleshooting tables” on page 28 and “Solving undetermined problems” on page 50.
- For information about power-supply problems, see “Solving power problems” on page 48.
- For intermittent problems, check the error log; see “Error logs” on page 16 and “Diagnostic programs, messages, and error codes” on page 40.

## Performing the checkout procedure

To perform the checkout procedure, complete the following steps:

1. Is the server part of a cluster?
  - **No:** Go to step 2.
  - **Yes:** Shut down all failing servers that are related to the cluster. Go to step 2.
2. Complete the following steps:
  - a. Turn off the server and all external devices.
  - b. Check all cables and power cords.
  - c. Set all monitor controls to the middle positions.
  - d. Turn on all external devices.
  - e. Turn on the server. If the server does not start, see “Troubleshooting tables” on page 28.
  - f. Check the system-error LED on the front of the server. If it is lit, check the LEDs on the system board (see “System-board LEDs” on page 10).
  - g. Check for the following results:
    - Successful completion of POST, indicated by a single beep
    - Successful completion of startup, indicated by a readable display of the operating-system desktop
3. Did one or more beeps sound, or was a POST error code displayed?
  - **Yes:** Find the beep code or error code in “POST beep codes” on page 13 or “POST error codes” on page 16; if necessary, see “Solving undetermined problems” on page 50.
  - **No:** Find the failure symptom in “Troubleshooting tables” on page 28; if necessary, run the diagnostic programs (see “Running the diagnostic programs” on page 40).
    - If you receive an error, see “Diagnostic error codes” on page 42.
    - If the diagnostic programs were completed successfully and you still suspect a problem, see “Solving undetermined problems” on page 50.

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## Checkpoint codes (trained service technicians only)

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

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

For a list of checkpoint codes for the System x3105 server, see <http://w3.pc.ibm.com/helpcenter/infotips/techinfo/MIGR-58350.html>.

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## Troubleshooting tables

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

If you cannot find a problem in these tables, see “Running the diagnostic programs” on page 40 for information about testing the server.

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

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

## CD or DVD drive problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Symptom	Action
The CD or DVD drive is not recognized.	<ol style="list-style-type: none"><li>1. Make sure that:<ul style="list-style-type: none"><li>• The IDE channel to which the CD or DVD drive is attached (primary or secondary) is enabled in the Configuration/Setup Utility program.</li><li>• All cables and jumpers are installed correctly.</li><li>• The correct device driver is installed for the CD or DVD drive.</li></ul></li><li>2. Run the CD or DVD drive diagnostic programs.</li><li>3. Reseat the following components:<ol style="list-style-type: none"><li>a. CD or DVD drive</li><li>b. CD or DVD drive cable</li><li>c. (Trained service technician only) System board</li></ol></li><li>4. Replace the components listed in step 3 on at a time, in the order shown, restating the server each time.</li></ol>
A CD or DVD is not working correctly.	<ol style="list-style-type: none"><li>1. Clean the CD or DVD.</li><li>2. Run the CD or DVD drive diagnostic programs.</li><li>3. Reseat the CD or DVD drive.</li><li>4. Replace the CD or DVD drive.</li></ol>
The CD or DVD drive tray is not working.	<ol style="list-style-type: none"><li>1. Make sure that the server is turned on.</li><li>2. Insert the end of a straightened paper clip into the manual tray-release opening.</li><li>3. Reseat the CD or DVD drive.</li><li>4. Replace the CD or DVD drive.</li></ol>

## 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 Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 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.	<ol style="list-style-type: none"><li>1. If there is a diskette in the drive, make sure that:<ul style="list-style-type: none"><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>• The software is working correctly.</li><li>• The cable is connected correctly (in the correct orientation).</li></ul></li><li>2. To prevent diskette drive read/write errors, make sure that the distance between monitors and diskette drives is at least 76 mm (3 in.).</li><li>3. Run the diskette drive diagnostic test.</li><li>4. Reseat the following components:<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><li>5. Replace the components listed in step 3 one at a time, in the order shown, restarting the server each time.</li></ol>

## General problems

<ul style="list-style-type: none"><li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li><li>• See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 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 indicator LED is not working, or a similar problem has occurred.	If the part is a CRU, replace it. If the part is a FRU, the part must be replaced by a trained service technician.

## Hard disk drive problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Symptom	Action
Not all drives are recognized by the hard disk drive diagnostic test (the Fixed Disk test).	Remove the drive that is indicated by the diagnostic tests; then, run the hard disk drive diagnostic test again. If the remaining drives are recognized, replace the drive that you removed with a new one.
The server stops responding during the hard disk drive diagnostic test.	Remove the hard disk drive that was being tested when the server stopped responding, and run the diagnostic test again. If the hard disk drive diagnostic test runs successfully, replace the drive that you removed with a new one.
A hard disk drive was not detected while the operating system was being started.	Reseat all hard disk drives and cables; then, run the hard disk drive diagnostic tests again.

## Intermittent problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Symptom	Action
A problem occurs only occasionally and is difficult to diagnose.	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><li>• Make sure the SCSI bus and devices are configured correctly and that the last external device in each SCSI chain is terminated correctly.</li></ul>



## Keyboard, mouse, or pointing-device problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
All or some keys on the keyboard do not work.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The keyboard cable is securely connected.</li> <li>• The server and the monitor are turned on.</li> </ul> </li> <li>2. Run the Configuration/Setup Utility program and enable keyboardless operation to prevent the 301 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 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 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 keyboardless operation and mouse options are 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 Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 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 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 banks of memory are enabled. The server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.</li></ul></li><li>2. Check the POST error log for error message 289:<ul style="list-style-type: none"><li>• If a DIMM was disabled by a system-management interrupt (SMI), replace the DIMM.</li><li>• If a DIMM was disabled by the user or by POST, run the Configuration/Setup Utility program and enable the DIMM.</li></ul></li><li>3. Run the memory diagnostics.</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> for information about installing optional memory modules).</li><li>5. Reseat the following components:<ol style="list-style-type: none"><li>a. DIMMs</li><li>b. (Trained service technician only) System board</li></ol></li><li>6. Replace the components listed in step 5 one at a time, in the order shown, restarting the server each time.</li></ol>

## Microprocessor problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Symptom	Action
The server emits a continuous beep during POST, indicating that the startup (boot) microprocessor is not working correctly.	<ol style="list-style-type: none"><li>1. (Trained service technician only) Reseat the microprocessor.</li><li>2. (Trained service technician only) Replace the microprocessor.</li></ol>

## Monitor or video problems

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

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 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. (Trained service technician only) Replace the system board.</li> </ol>
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 36.</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>• No beep codes sound when the server is turned on.</li> </ul> <p><b>Important:</b> In some memory configurations, the 3-3-3 beep code might sound during POST, followed by a blank monitor screen. If this occurs and the <b>Boot Fail Count</b> option in the <b>Startup Option</b> of the Configuration/Setup Utility program is enabled, you must restart the server three times to reset the configuration settings to the default configuration (the memory connector or bank of connectors enabled).</p> </li> <li>2. Make sure 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” on page 46.</li> <li>4. Observe the checkpoint LEDs on the system board; if the codes are changing, go to the next step. If the codes are not changing, see “Checkpoint codes (trained service technicians only)” on page 27.</li> <li>5. See “Solving undetermined problems” on page 50.</li> </ol>
Only the cursor appears.	See “Solving undetermined problems” on page 50.
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” on page 40). <ul style="list-style-type: none"> <li>• If the server passes the video diagnostics, the video is good; see “Solving undetermined problems” on page 50.</li> <li>• (Trained service technician only) If the server fails the video diagnostics, reseal the system board.</li> <li>• (Trained service technician only) 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 Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Symptom	Action
The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.	<ol style="list-style-type: none"> <li>1. If the monitor self-tests show 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 following components: <ol style="list-style-type: none"> <li>a. Monitor</li> <li>b. Video adapter (if one is installed)</li> <li>c. (Trained service technician only) 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>
Wrong characters appear on the screen.	<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” on page 93).</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. Monitor</li> <li>b. Video adapter (if one is installed)</li> <li>c. (Trained service technician only) 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>

## Optional-device problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Symptom	Action
An IBM optional device that was just installed does not work.	<ol style="list-style-type: none"><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. If the failing device is a SCSI device, make sure that:<ul style="list-style-type: none"><li>• The cables for all external SCSI devices are connected correctly.</li><li>• The last device in each SCSI chain, or the end of the SCSI cable, is terminated correctly.</li><li>• Any external SCSI device is turned on. You must turn on an external SCSI device before turning on the server.</li></ul></li><li>4. Reseat the failing device.</li><li>5. Replace the failing device.</li></ol>

## Power problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Symptom	Action
<p>The power-control button does not work, and the reset 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 ac power-supply voltage switch on the rear of the server is set to the correct voltage for your geography.</li> <li>2. Make sure that the power-control button is working correctly: <ol style="list-style-type: none"> <li>a. Disconnect the server power cords.</li> <li>b. Reconnect the power cords.</li> <li>c. (Trained service technician only) Reseat the operator information panel cables, and then repeat steps 2a and 2b. If the server starts, reseat the operator information panel. If the problem remains, replace the operator information panel.</li> </ol> </li> <li>3. Make sure that the reset button is working correctly: <ol style="list-style-type: none"> <li>a. Disconnect the server power cords.</li> <li>b. Reconnect the server power cords.</li> </ol> </li> <li>4. Make sure that: <ul style="list-style-type: none"> <li>• The power cords are correctly connected the server and to a working electrical outlet.</li> <li>• The type of memory that is installed is correct.</li> <li>• The LEDs on the power supply do not indicate a problem.</li> </ul> </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 “Solving undetermined problems” on page 50.</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. 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 power switch/LED bracket are not lit.	See “Solving undetermined problems” on page 50.

## Serial port problems

<ul style="list-style-type: none"> <li>Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 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>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 present) is seated correctly.</li> </ul> </li> <li>Reseat the serial port adapter.</li> <li>Replace the serial port adapter.</li> </ol>
A serial device does not work.	<ol style="list-style-type: none"> <li>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 (see “System-board external connectors” on page 9).</li> </ul> </li> <li>Reseat the following components: <ol style="list-style-type: none"> <li>Failing serial device</li> <li>Serial cable</li> <li>(Trained service technician only) System board</li> </ol> </li> <li>Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.</li> </ol>

## ServerGuide problems

<ul style="list-style-type: none"> <li>Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
The <i>ServerGuide™ Setup and Installation</i> CD will not start.	<ol 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> </ol>
The ServeRAID™ Manager program cannot view all installed drives, or the operating system cannot be installed.	<ol 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> </ol>
The operating-system installation program continuously loops.	Make more space available on the hard disk.

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 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 ServerGuide program will not start the operating-system CD.	Make sure that the operating-system CD is supported by the ServerGuide program. See the <i>ServerGuide Setup and Installation</i> CD label for a list of supported operating-system versions.
The operating system cannot be installed; the option is not available.	Make sure that the server supports the operating system. If it does, either no logical drive is defined (SCSI RAID 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 Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 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) port problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 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. 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>2. Make sure that the USB configuration options are set correctly in the Configuration/Setup Utility program (see the <i>User's Guide</i> for more information).</li><li>3. If you are using a USB hub, disconnect the USB device from the hub and connect it directly to the server.</li></ol>

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## Diagnostic programs, messages, and error codes

The diagnostic programs are the primary method of testing the major components of the server. As you run the diagnostic programs, text messages and error codes are displayed on the screen and are saved in the test log. A diagnostic text message or error code indicates that a problem has been detected; to determine what action you should take as a result of a message or error code, see the table in “Diagnostic error codes” on page 42.

### Running the diagnostic programs

To run the diagnostic programs, complete the following steps:

1. If the server is running, turn off the server and all attached devices.
2. Turn on all attached devices; then, turn on the server.
3. When the prompt Press <F1> for Configuration/Setup is displayed, press F1.
4. When the Configuration/Setup Utility menu is displayed, select **Startup Option** → **Startup Sequence Options**.
5. Note the device that is selected as the first startup device. Later, you must restore this setting.
6. Make sure that **CD/DVD-ROM** is selected as the first startup device.
7. Press Esc two times to return to the Configuration/Setup Utility menu.
8. Insert the *IBM Enhanced Diagnostics* CD into the CD or DVD drive.
9. Select **Save Settings**; then, select **Exit Setup** and follow the prompts. The diagnostic programs will load.
10. From the diagnostic programs screen, select the test that you want to run, and follow the instructions on the screen.

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

- You want to run a faster test
- The server contains SATA drives that are not connected to a SAS controller or IDE hard disk drives

For help with the diagnostic programs, press F1. You also can press F1 from within a help screen to obtain online documentation from which you can select different categories. To exit from the help information, press Esc.

To determine what action you should take as a result of a diagnostic text message or error code, see the table in “Diagnostic error codes” on page 42.

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

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

**Exception:** If there are multiple error codes that indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 32 for information about diagnosing microprocessor problems.

If the server stops during testing and you cannot continue, restart the server and try running the diagnostic programs again. If the problem remains, replace the component that was being tested when the server stopped.

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

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

## Diagnostic text messages

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

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

**Failed:** The test detected an error.

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

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

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

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

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

## Viewing the test log

To view the summary test log when the tests are completed, use any of the following procedures:

- View the summary test log by pressing F3 or by selecting **Utility** from the top of the screen and selecting **View Test Log**. Press Page Up and Page Down to view the entire log.
- View the detailed test log by pressing Tab while the summary test log is displayed. Press Page Up and Page Down to view the entire log.
- Save the test log to a file on a diskette or to the hard disk by selecting **Utility** from the top of the screen and selecting **Save Test Log**.

### Notes:

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

2. The test log data is maintained only while the diagnostic programs are active. When you exit from the diagnostic programs, the test log is cleared. Save the test log to a file on a diskette or to the hard disk if you want to refer to it later.

## Diagnostic error codes

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

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

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

- 000** The server passed the test. Do not replace a CRU or FRU.
- 195** The Esc key was pressed to end the test. Do not replace a CRU or FRU.
- 197** This is a warning error, but it does not indicate a hardware failure; do not replace a CRU or FRU. Take the action that is indicated in the Action column but *do not replace a CRU or a FRU*. See the description of **Warning** in “Diagnostic text messages” on page 41 for more information.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
001-292-000	Core system: failed/CMOS checksum failed.	Load the BIOS default settings using the Configuration/Setup Utility program and run the test again (see “Using the Configuration/Setup Utility program” on page 94).
001-xxx-000	Failed core tests.	(Trained service technician only) Replace the system board.
001-xxx-001	Failed core tests.	(Trained service technician only) Replace the system board.
005-xxx-000	Failed video test.	(Trained service technician only) Replace the system board.
001-197-000 001-198-000	Test aborted.	<ol style="list-style-type: none"> <li>1. Check the test log for messages that indicate the cause of the error, and take the indicated action.</li> <li>2. Restart the server and run the diagnostic test again.</li> <li>3. Run the Quick Memory Test All Banks diagnostic; then, if an error is detected, take the indicated action.</li> <li>4. Reinstall and, if necessary, update the BIOS code on the server; then, run the test again (see “Updating the firmware” on page 93).</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
001-250-00n	ECC test logic failed.	<ol style="list-style-type: none"> <li>1. Restart the server.</li> <li>2. Run the diagnostic test again.</li> <li>3. (Trained service technician) Replace the failing microprocessor.</li> </ol>
011-xxx-000	Failed COM1 serial port test.	(Trained service technician only) Replace the system board.
015-xxx-001	Failed USB test.	(Trained service technician only) Replace the system board.
015-xxx-198	USB device connected during USB test.	<ol style="list-style-type: none"> <li>1. Remove all USB devices and run the test again.</li> <li>2. (Trained service technician only) Replace the system board.</li> </ol>
020-xxx-000	Failed PCI Interface test.	(Trained service technician only) Replace the system board.
201-xxx-0nn	Failed memory test; <i>nn</i> = slot number of failing DIMM.	<ol style="list-style-type: none"> <li>1. Reseat the DIMM in slot <i>nn</i>.</li> <li>2. Replace the following components one at a time, in the order shown, restarting the server each time: <ol style="list-style-type: none"> <li>a. DIMM in slot <i>nn</i></li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
201-xxx-n99	Multiple DIMM failure; <i>n</i> = bank number of failing pair.	<ol style="list-style-type: none"> <li>1. See the error text to identify the failing DIMMs.</li> <li>2. Reseat the DIMMs in bank <i>nn</i>.</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. DIMMs in bank <i>nn</i></li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
201-198-xxx	Memory test aborted.	<ol style="list-style-type: none"> <li>1. Restart the server.</li> <li>2. Run the diagnostic test again.</li> <li>3. Reinstall the diagnostic program.</li> <li>4. Refer to the error log for additional information.</li> </ol>
201-199-xxx	Unexpected error.	<ol style="list-style-type: none"> <li>1. Restart the server.</li> <li>2. Run the diagnostic test again.</li> <li>3. Reinstall the diagnostic program.</li> <li>4. Refer to the error log for additional information.</li> </ol>

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
201-xxx-PBD	Test failed: <ul style="list-style-type: none"> <li>• B = Failing bank/pair number</li> <li>• D = 9 = Both DIMMs in the failing bank/pair of DIMMs</li> </ul>	<ul style="list-style-type: none"> <li>• Reseat the failing DIMMs; then, run the memory diagnostics test again.</li> <li>• Replace the failing DIMMs; then, run the memory diagnostic test again.</li> <li>• (Trained service technician only) Replace the system board.</li> </ul>
204-198-000	Test aborted.	<ol style="list-style-type: none"> <li>1. Run the Quick Memory Test Diagnostic All Banks (see “Running the diagnostic programs” on page 40).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 93).</li> <li>3. Look in the test log (see “Viewing the test log” on page 41) and correct any other errors.</li> </ol>
204-210-000	Test failed.	<ol style="list-style-type: none"> <li>1. Run the Quick Memory Test Diagnostic All Banks (see “Running the diagnostic programs” on page 40).</li> <li>2. Update the BIOS code (see “Updating the firmware” on page 93).</li> <li>3. Look in the test log (see “Viewing the test log” on page 41) and correct any other errors.</li> </ol>
215-xxx-000	Failed CD or DVD test.	<ol style="list-style-type: none"> <li>1. Run the test again with a different CD or DVD.</li> <li>2. Reseat the following components: <ol style="list-style-type: none"> <li>a. CD or DVD drive cable</li> <li>b. Power switch/LED bracket cable</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. CD or DVD drive cable</li> <li>b. CD or DVD drive</li> <li>c. Power switch/LED bracket cable</li> </ol> </li> </ol>
217-xxx-000	Failed fixed disk test.	<ol style="list-style-type: none"> <li>1. Reseat hard disk drive 1 cable.</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. Hard disk drive 1 cable</li> <li>b. Hard disk drive 1</li> </ol> </li> </ol>
217-xxx-001	Failed fixed disk test.	<ol style="list-style-type: none"> <li>1. Reseat hard disk drive 2 cable.</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. Hard disk drive 2 cable</li> <li>b. Hard disk drive 2</li> </ol> </li> </ol>

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 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
217-xxx-002	Failed fixed disk test.	<ol style="list-style-type: none"> <li>1. Reseat hard disk drive 3 cable.</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. Hard disk drive 3 cable</li> <li>b. Hard disk drive 3</li> </ol> </li> </ol>
217-198-xxx	Could not establish drive parameters.	<ol style="list-style-type: none"> <li>1. Reseat the hard disk drive cable and check terminators.</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. Hard disk drive cable</li> <li>b. Hard disk drive</li> </ol> </li> </ol>
301-xxx-000	Failed keyboard test. <b>Note:</b> After installing a USB keyboard, you might have to use the Configuration/Setup Utility program to enable keyboardless operation and prevent the POST error message 301 from being displayed during startup.	<ol style="list-style-type: none"> <li>1. Reseat the keyboard cable.</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. Keyboard</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
302-xxx-xxx	Failed mouse test.	<ol style="list-style-type: none"> <li>1. Reseat the mouse cable.</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. Mouse</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
305-xxx-xxx	Failed video monitor test.	<ol style="list-style-type: none"> <li>1. Reseat the monitor cable.</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. Monitor</li> <li>b. (Trained service technician only) System board</li> </ol> </li> </ol>
405-xxx-000	Failed Ethernet test on controller on the system board.	<ol style="list-style-type: none"> <li>1. Make sure that Ethernet is not disabled in the Configuration/Setup Utility program and that the BIOS code is at the latest level.</li> <li>2. (Trained service technician only) Reseat the system board.</li> <li>3. (Trained service technician only) Replace the system board.</li> </ol>

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 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
405-xxx-00n	<p>Failed Ethernet test on the adapter in PCI slot <i>n</i>.</p> <ul style="list-style-type: none"> <li>• For single-port servers <math>n &gt; 0</math>, (adapter in PCI slot <i>n</i>)</li> <li>• For dual-port servers <math>n &gt; 1</math>, (adapter in PCI slot <i>n</i>)</li> </ul>	<ol style="list-style-type: none"> <li>1. Complete the following steps to identify the slot on the riser card:               <ol style="list-style-type: none"> <li>a. Run the Configuration/Setup Utility program.</li> <li>b. Select <b>Advanced Setup</b> → <b>PCI Slot/Device Information</b>.</li> </ol> <p>In the information for the Ethernet controller, the entry in the Slot column is the PCI slot number for the adapter.</p> <p><b>Note:</b> If multiple adapters are installed, the failing adapter is the one with a MAC address in the Ethernet controller information that matches the MAC address on the diagnostics screen where the failure occurs.</p> </li> <li>2. Reseat the Ethernet adapter in slot <i>n</i>.</li> <li>3. Replace the Ethernet adapter in slot <i>n</i>.</li> </ol>

## Recovering from a BIOS update failure

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

The flash memory of the server consists of a primary page and a backup page. If the BIOS code in the primary page is damaged, the baseboard management controller will detect the error and automatically switch to the backup page to start the server. If this happens, a POST message Booted from backup POST/BIOS image is displayed. The backup page version might not be the same as the primary page version.

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

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

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

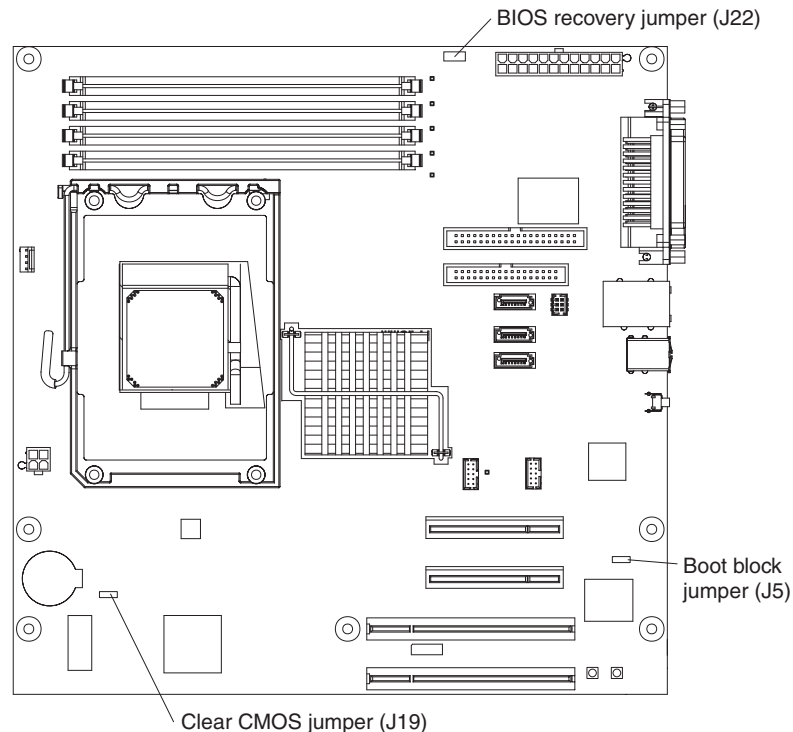
1. Go to <http://www.ibm.com/servers/eserver/support/xseries/index.html>.
2. From the **Hardware** list, select **System x3105**.
3. From the **Software** list, select the applicable operating environment and click **Go**.
4. Click the **Download** tab.
5. Click **BIOS, drivers, and firmware** for the applicable operating environment.
6. Download the latest BIOS code update.



7. Update the BIOS code, following the instructions that come with the update file that you downloaded. This automatically restores and updates the primary page.
8. Restart the server.

If that procedure fails, the server might not restart correctly or might not display video. To manually restore the BIOS code, complete the following steps:

1. Read the safety information that begins on page vii and “Handling static-sensitive devices” on page 60.
2. Turn off the server and peripheral devices and disconnect all external cables and power cords; then, remove the cover.
3. Locate the boot block recovery jumper (J5 on the system board). Remove any adapters that impede access to the jumper. The following illustration shows the location of the jumper on the system board.



4. Move the boot block jumper to pins 2 and 3.
5. Wait 30 seconds; then, connect the server to the ac power source.
6. Insert the BIOS flash diskette or CD.
7. Restart the server.
8. When POST starts, select **1 - Update POST/BIOS** from the menu that contains various flash (update) options.
9. When you are asked whether you want to save the current code to a diskette, type N.
10. Type 1 and press Enter to continue.  
**Attention:** Do not restart or turn off the server until the update is completed.
11. When the update is completed, turn off the server.
12. Remove ac power from the server.
13. Move the boot block jumper back onto pins 1 and 2.
14. Wait 30 seconds; then, connect the server to the ac power source.
15. Replace the cover; then, restart the server.

---

## Solving SCSI problems

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

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

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

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

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

---

## Solving power problems

Power problems can be difficult to solve. For example, a short circuit can exist anywhere on any of the power distribution buses. Usually, a short circuit will cause the power subsystem to shut down because of an overcurrent condition. To diagnose a power problem, use the following general procedure:

1. Turn off the server and disconnect all ac power cords.
2. Make sure that the ac power-supply voltage switch on the rear of the server is set to the correct voltage (115 V ac or 230 V ac) for your geography.
3. Check for loose cables in the power subsystem. Also check for short circuits, for example, if a loose screw is causing a short circuit on a circuit board.
4. Remove the adapters and disconnect the cables and power cords to all internal and external devices until the server is at the minimum configuration that is required for the server to start (see “Solving undetermined problems” on page 50 for the minimum configuration).
5. Reconnect all ac power cords and turn on the server. If the server starts successfully, replace the adapters and devices one at a time until the problem is isolated.

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

---

## Solving Ethernet controller problems

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

Try the following procedures:

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

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

---

## Solving undetermined problems

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

If you suspect that a software problem is causing failures (continuous or intermittent), see “Software problems” on page 38.

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, use the clear CMOS jumper (J19) to clear the CMOS memory; see “System-board jumpers” on page 11. If you suspect that the BIOS code is damaged, see “Recovering from a BIOS update failure” on page 46.

Check the LEDs on the power supply. If the LEDs indicate that the power supply is working correctly, complete the following steps:

1. Turn off the server.
2. Make sure that the server is cabled correctly.
3. Remove or disconnect the following devices, one at a time, until you find the failure. Turn on the server and reconfigure it each time.
  - Any external devices
  - Surge-suppressor device (on the server)
  - Modem, printer, mouse, and non-IBM devices
  - Each adapter.
  - Hard disk drives.
  - Memory modules. The minimum configuration requirement is one 512 MB DIMM.

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

- A microprocessor
  - One 512 MB DIMM on the system board
  - A power supply
  - Power cord
  - System board
4. Turn on the server. If the problem remains, suspect the following components in the following order:
    - a. System board
    - b. Memory module
    - c. Microprocessor

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

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

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## Calling IBM for service

See Appendix A, “Getting help and technical assistance,” on page 97 for information about calling IBM for service.

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

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

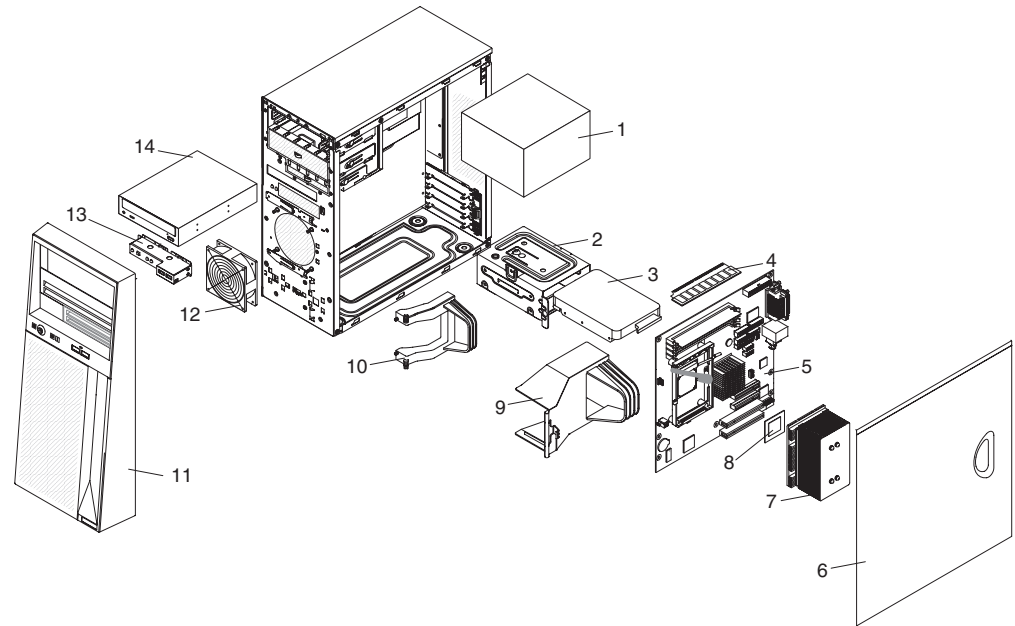
You can solve some problems by comparing the configuration and software setups between working and nonworking servers. When you compare servers to each other for diagnostic purposes, consider them identical only if all the following factors are exactly the same in all the servers:

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



## Chapter 3. Parts listing, System x3105 Type 4347

The following replaceable components are available for the System x3105 Type 4347 server.



## Replaceable server components

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

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

Table 3. Parts listing, Type 4347

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
1	Power supply, 310 watt (all models)			42C8169
2	Cage, hard disk drive (all models)		39Y8695	
3	Hard disk drive, 80 GB (models 22x, 42x, 52x)		39M4503	
3	Hard disk drive, 160 GB (models 44x, 46x, 64x, 66x, 74x)		39M4507	
3	Hard disk drive, 250 GB (model 54x)		39M4511	
4	Memory, 512 MB, DDR2, 667, ECC (all models)	41Y2725		
4	Memory, 1 GB, DDR2, 667, ECC (all models)	41Y2728		
4	Memory, 2 GB, DDR2, 667, ECC (all models)	41Y2731		
5	System board (all models)			39Y8689
6	Cover (all models)	39Y8698		
7	Heat sink, microprocessor (all models)			39Y8701
8	Microprocessor, 1.6 GHz (model 22x)			41Y3637
8	Microprocessor, 1.8 GHz (models 42x, 44x)			41Y3639
8	Microprocessor, 2.0 GHz (models 52x, 54x)			41Y3641
8	Microprocessor, 2.2 GHz (models 64x, 66x)			41Y3643
8	Microprocessor, 2.4 GHz (model 74x)			41Y3645
9	Microprocessor air baffle	39Y8697		
10	Adapter retention bracket			42C8186
11	Bezel (all models)	39Y8696		
12	Fan, system (all models)		39Y8702	
13	Control panel, front (all models)		42C8178	
14	CD-ROM/DVD-ROM, 48x, combo drive (primary) (models 46x, 54x, 64x, 66x, 74x)		26K5429	
14	CD-ROM/DVD-ROM, 48x, combo drive (alternate) (models 46x, 54x, 64x, 66x, 74x)		39M3539	
14	CD-ROM drive, 48x (primary) (models 22x, 42x, 44x, 52x)		39M3509	
14	CD-ROM drive, 48x (alternate) (22x, 42x, 44x, 52x)		39M3511	



Table 3. Parts listing, Type 4347 (continued)

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
	Battery, 3.0 volt (all models)		33F8354	
	Cable, FDD		42C8165	
	Cable, Front LED		42C8166	
	Cable, ODD		41Y3587	
	Cable, front USB		42C8167	
	Cable, power	39M5980		
	Cable, SATA		41Y3823	
	Carrier	25R0037		
	Cartridge	25R0038		
	Chassis (all models)			39Y8693
	Fan Duct	39Y8697		
	Kit, miscellaneous parts (all models)		39Y8700	
	Mouse (all models)	39Y9875		
	Retention module, fan sink (all models)			39Y8692
	System service label (all models)	39Y8699		

## Keyboards

Keyboard	CRU Number
Arabic (253)	39M6990
Arabic/French (462)	39M6991
Belgian/French (120)	39M6992
Belgian/UK (120)	39M6993
Brazilian/Portuguese (275)	39M6994
Bulgarian (442)	39M6995
Chinese/US (467)	39M6996
Czech ABB	39M6997
Danish (159)	39M6998
Dutch (143)	39M6999
English, UK (166)	39M7027
English, US (103P)	39M6989
English, US,-EMEA (103P)	39M7028
French (189)	39M7000
French Canadian (058)	39M7002
French Canadian (445)	39M7001
German (129)	39M7003
Greek (319)	39M7004
Hebrew (212)	39M7005

<b>Keyboard</b>	<b>CRU Number</b>
Hungarian (208)	39M7006
Icelandic (197)	39M7007
Italian (141)	39M7008
Italian (142)	39M7009
Japanese (194)	39M7010
Korean (413)	39M7011
Norwegian (155)	39M7013
Polish (214)	39M7014
Portuguese (163)	39M7015
Romanian (96)	39M7016
Russian (443)	39M7017
Russian/Cyrillic (441)	39M7018
Serbian/Cyrillic (118)	39M7019
Slovenian (234)	39M7029
Slovic (245)	39M7020
Spanish (172)	39M7021
Spanish, Latin American (171)	39M7012
Swedish/Finnish (153)	39M7022
Swiss, F/G (150)	39M7023
Thailand (191)	39M7024
Turkish (179)	39M7026
Turkish (440)	39M7025

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## Power cords

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

IBM power cord part number	Used in these countries and regions
39M5206	China
39M5102	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea
39M5123	Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic of), Congo (Republic of), Cote D'Ivoire (Ivory Coast), Croatia (Republic of), Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Guyana, French Polynesia, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Laos (People's Democratic Republic of), Latvia, Lebanon, Lithuania, Luxembourg, Macedonia (former Yugoslav Republic of), Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova (Republic of), Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Reunion, Romania, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia (Republic of), Somalia, Spain, Suriname, Sweden, Syrian Arab Republic, Tajikistan, Tahiti, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis and Futuna, Yugoslavia (Federal Republic of), Zaire
39M5130	Denmark
39M5144	Bangladesh, Lesotho, Macao, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda
39M5151	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dominica, Gambia, Ghana, Grenada, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Polynesia, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad and Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
39M5158	Liechtenstein, Switzerland
39M5165	Chile, Italy, Libyan Arab Jamahiriya
39M5172	Israel
39M5095	220 - 240 V Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Taiwan, United States of America, Venezuela

IBM power cord part number	Used in these countries and regions
39M5081	110 - 120 V Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States of America, Venezuela
39M5219	Korea (Democratic People's Republic of), Korea (Republic of)
39M5199	Japan
39M5068	Argentina, Paraguay, Uruguay
39M5226	India
39M5233	Brazil

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## Chapter 4. Removing and replacing server components

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

See Chapter 3, “Parts listing, System x3105 Type 4347,” on page 53 to determine whether a component is a Tier 1 CRU, Tier 2 CRU, or FRU.

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

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### Installation guidelines

Before you remove or replace a component, read the following information:

- Read the safety information that begins on page vii and the guidelines in “Handling static-sensitive devices” on page 60. This information will help you work safely.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- If you must start the server while the cover is removed, make sure that no one is near the server and that no other objects have been left inside the server.
- Do not attempt to lift an object that you think is too heavy for you. If you have to lift a heavy object, observe the following precautions:
  - Make sure that you stand safely without slipping.
  - Distribute the weight of the object equally between your feet.
  - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
  - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles
- Make sure that you have an adequate number of properly grounded electrical outlets for the server, monitor, and other devices.
- Back up all important data before you make changes to disk drives.
- Have a small flat-blade screwdriver available.
- 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.
- When you install optional devices, you might find it easier to work with the server lying 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 cooling and system reliability, make sure that:

- Each of the drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed in it.
- If the server has redundant power, each of the power-supply bays has a power supply installed in it.
- There is adequate space around the server to allow the server cooling system to work properly. Leave approximately 50 mm (2 in.) of open space around the front and rear of the server. Do not place objects in front of the fans. For proper cooling and airflow, replace the server cover before turning on the server. Operating the server for extended periods of time (more than 30 minutes) with the server cover removed might damage server components.
- You have followed the cabling instructions that come with optional adapters.
- You do not operate the server with a failed fan.
- You do not run the server without the air baffle installed. Operating the server without the air baffle might cause the microprocessor to overheat.

## Handling static-sensitive devices

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

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

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

## Returning a device or component

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

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## Removing and replacing Tier 1 CRUs

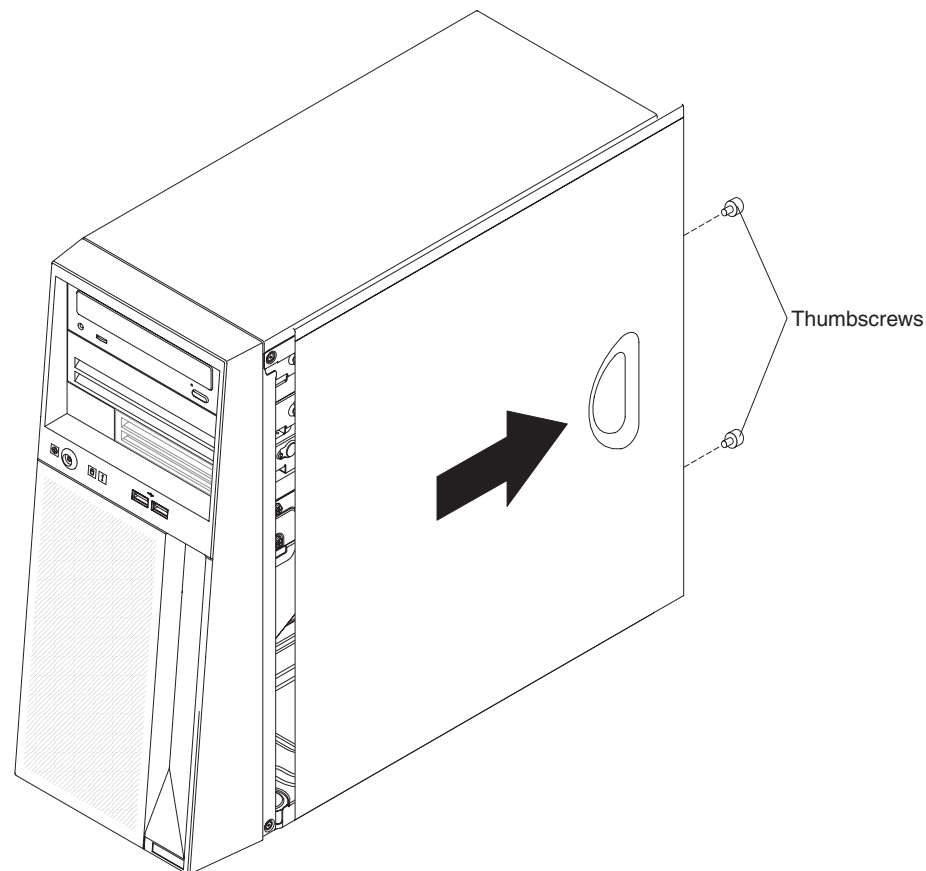
Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

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

### Removing the cover

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

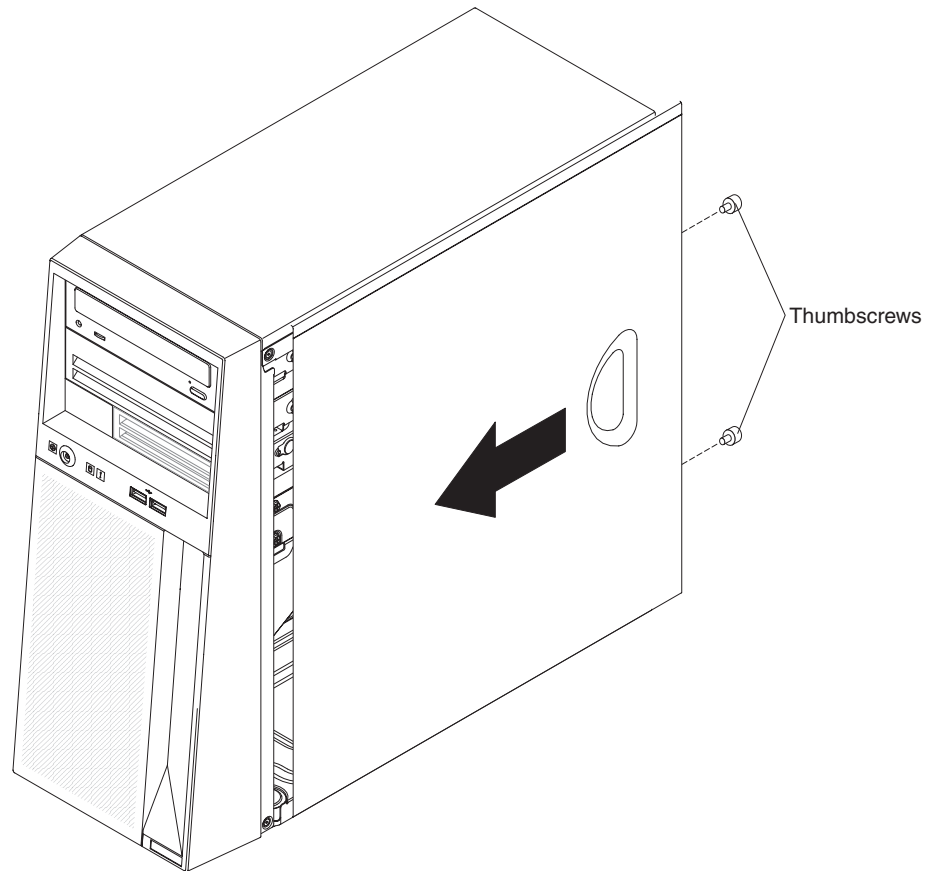
To remove the cover, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and all attached devices; then, disconnect the power cords and all external cables.
3. Lay the server on its side.
4. Remove the two thumbscrews at the rear of the cover.
5. Lift the rear of the cover and pull it toward the rear of the server to disengage the front edge from the chassis.
6. If you are instructed to return the cover, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you. If you are not returning the cover, store it and the thumbscrews in a safe place for reuse.

## Installing the cover

To install the cover, complete the following steps.

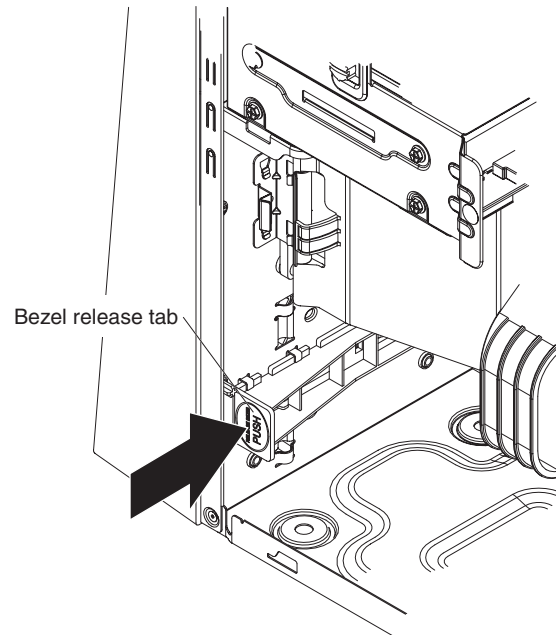


1. Make sure that:
  - All cables, adapters, and other components are installed and seated correctly.
  - You have removed all work tools or parts from inside the server.
  - All internal cables are correctly routed.
2. Place the front edge of the cover into position on the front edge of the server and lower the cover onto the chassis.
3. Install the two thumbscrews at the rear of the cover.
4. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
5. Turn on the attached devices; then, turn on the server.



## Removing the bezel

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

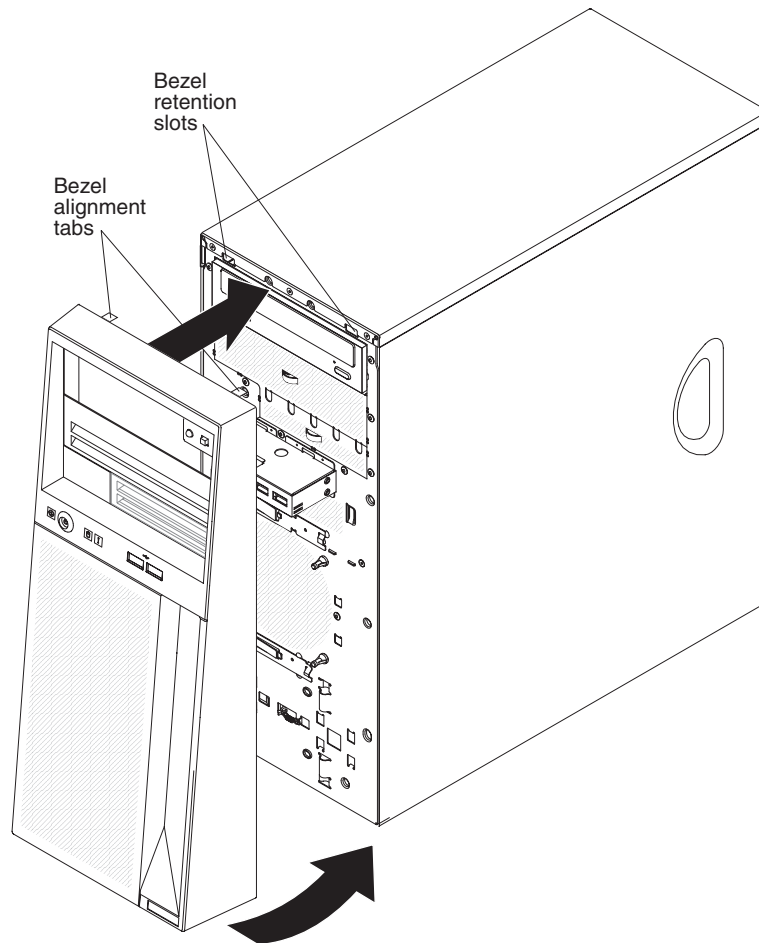


To remove the bezel, complete the following steps.

1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and all peripheral devices; then, disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 61).
4. From inside the chassis, locate the bezel release tab at the bottom of the bezel.
5. Press down on the bezel release tabs to disengage the bezel from the chassis; then, lift the bezel off of the front of the server.
6. If you are instructed to return the bezel, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you. If you are not returning the bezel, store it in a safe place for reuse.

## Installing the bezel

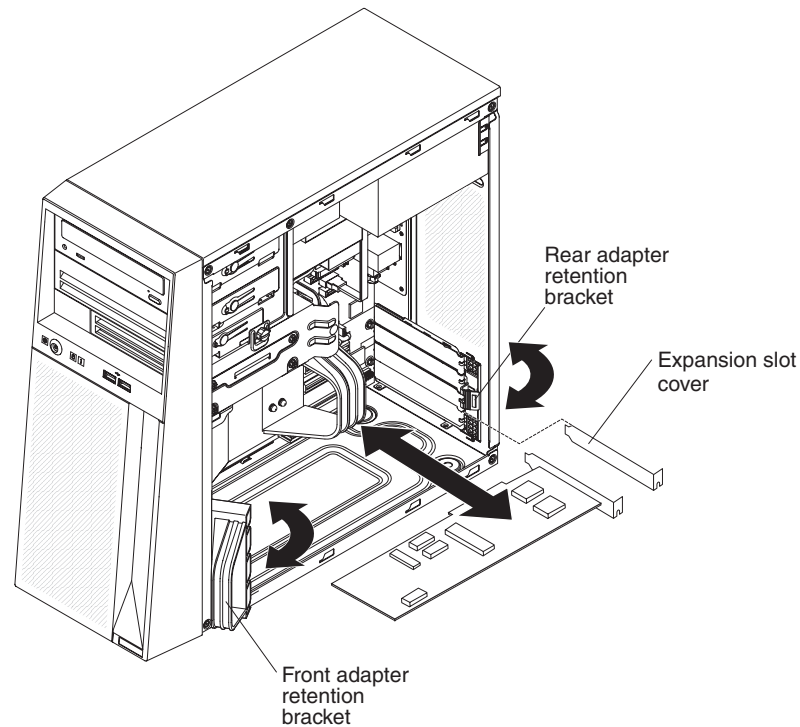
To install the bezel, complete the following steps.



1. Insert the two alignment tabs at the top of the bezel into the corresponding openings in the chassis above the CD or DVD drive.
2. Align the two lower tabs of the bezel with the corresponding openings in the chassis and gently press on the bezel until it clicks into place.
3. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
4. Turn on the attached devices; then, turn on the server.

## Removing an adapter

To remove an adapter, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and all attached devices; then, disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 61).

**Note:** It might be helpful to lay the server on its left side for the remainder of this procedure.

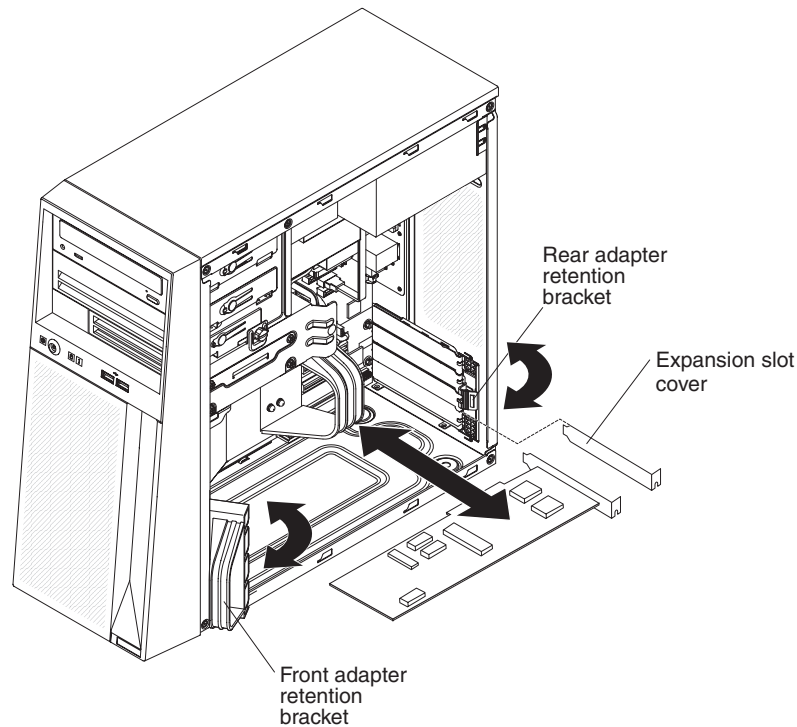
4. Disconnect any cables from the adapter.
5. Rotate the front adapter retention bracket upward.
6. From inside the server, press down on the rear adapter retention bracket. The retention bracket springs open.
7. Carefully grasp the adapter by its top edge or upper corners, and pull the adapter from the server.
8. If the server will be used before a replacement adapter is installed, install an expansion-slot cover in the slot.

**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.

9. If you are instructed to return the adapter, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you. If you are not returning the adapter, store it in a safe place for reuse.

## Installing an adapter

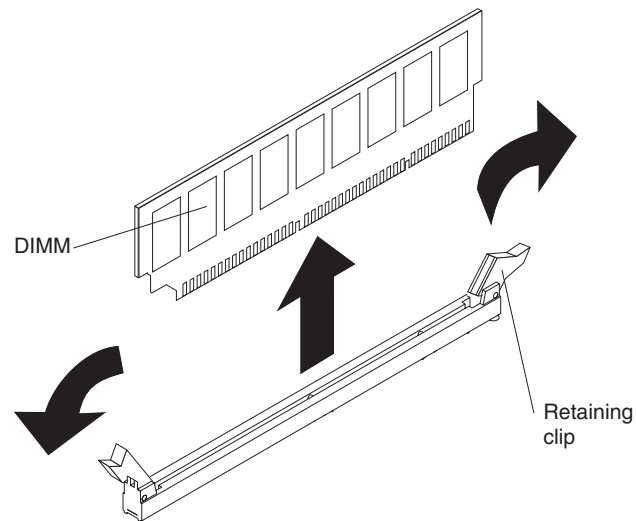
To install an adapter, complete the following steps.



1. Follow the cabling instructions, if any, that come with the adapter. Route the adapter cables before you install the adapter.
2. Follow the instructions that come with the adapter to set jumpers or switches, if any.
3. Touch the static-protective package that contains the adapter to any unpainted metal surface on the server. Then, remove the adapter from the static-protective package. Avoid touching the components and gold-edge connectors on the adapter.
4. 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.
5. Rotate the front adapter bracket downward into the server.
6. Close the rear adapter retainer bracket.
7. Connect any required cables to the adapter. Route cables so that they do not block the flow of air from the fans. If you are installing an optional SCSI adapter, see the *User's Guide* for additional information about cabling a SCSI adapter.
8. Install the cover (see "Installing the cover" on page 62).
9. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
10. Turn on the attached devices; then, turn on the server.

## Removing a memory module

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



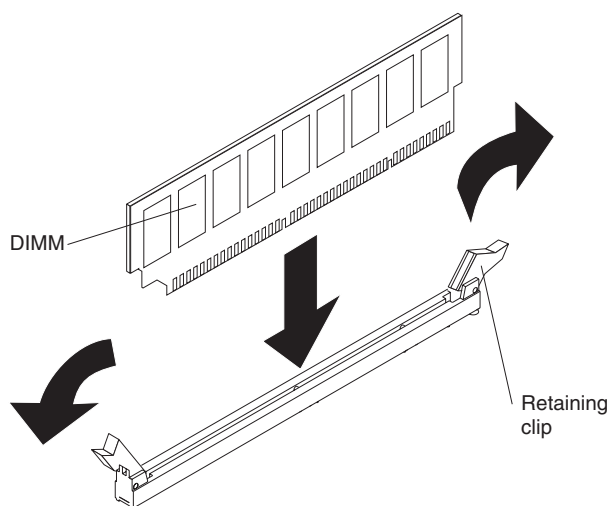
1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and all peripheral devices; then, disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 61).
4. Disconnect any cables that impede access to the DIMMs.  
**Attention:** To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.
5. Carefully open the retaining clips on each end of the DIMM connector and remove the DIMM.
6. If you are instructed to return the DIMM, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a memory module

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

Number of DIMMs	Connector numbers
One DIMM	1
Two DIMMs	1, 2
Three DIMMs	Not supported
Four DIMMs	1, 2, 3, 4

To install a replacement DIMM, complete the following steps.



1. Make sure that the retaining clips on each end of the DIMM connector are fully open.
2. Touch the static-protective package that contains the new DIMM to any unpainted metal surface on the server. Then, remove the new DIMM from the package.
3. Turn the DIMM so that the contacts align correctly with the connector.  
**Attention:** To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.
4. Insert the DIMM into the 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 reinsert it.
5. Reconnect any cables that you disconnected during removal.
6. Install the cover (see "Installing the cover" on page 62).
7. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
8. Turn on the attached devices; then, turn on the server.

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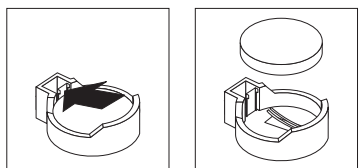
## Removing and replacing Tier 2 CRUs

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

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

### Removing the battery

To remove the battery, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and all peripheral devices; then, disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 61).
4. Remove any adapters that impede access to the battery.
5. Locate the battery on the system board (see “System-board optional-device connectors” on page 7).
6. Remove the battery:
  - a. Use one finger to press the top of the battery clip away from the battery.
  - b. Lift and remove the battery from the socket.
7. Dispose of the battery as required by local ordinances or regulations (see “Battery return program” on page 103 for more information).

### Installing the battery

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

- You must replace the battery with a lithium battery of the same type from the same manufacturer.
- To order replacement batteries, call 1-800-426-7378 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.
- After you replace the battery, you must reconfigure the server and reset the system date and time.
- To avoid possible danger, read and follow the following safety statement.

**Statement 2:**



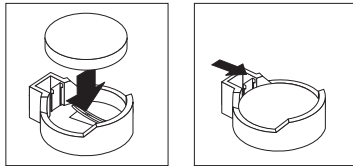
**CAUTION:**

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

*Do not:*

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

To install the replacement battery, complete the following steps.

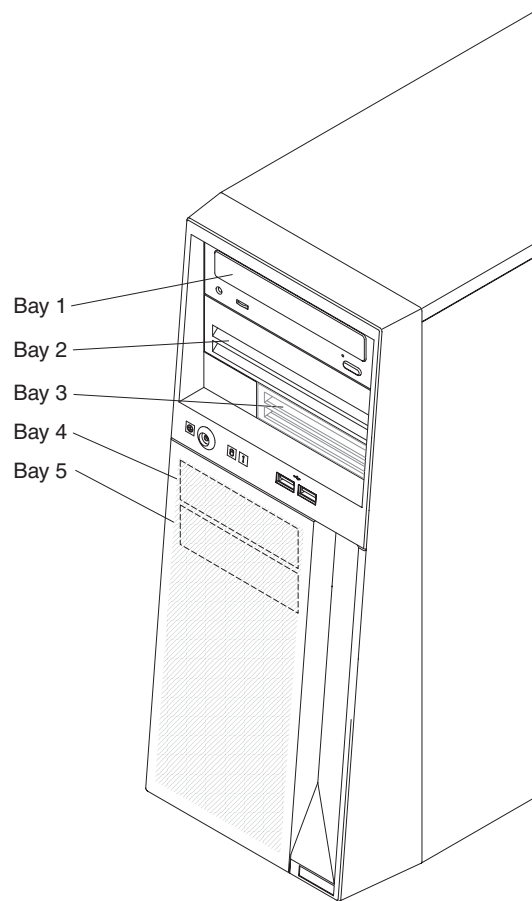


1. Follow any special handling and installation instructions that come with the replacement battery.
2. Insert the new battery:
  - a. Tilt the battery so that you can insert it into the socket on the side opposite the battery clip.
  - b. Press the battery down into the socket until it clicks into place. Make sure that the battery clip holds the battery securely.
3. Reinstall any adapters that you removed.
4. Install the cover. (See “Installing the cover” on page 62).
5. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
6. Turn on the attached devices; then, turn on the server.
7. Start the Configuration/Setup Utility program and reset the configuration.
  - Set the system date and time.
  - Set the passwords, if necessary.
  - Save the configuration.



## Removing and installing internal drives

This section describes the removal and installation of internal drives. See the *User's Guide* for more information about the types of drives that the server supports. The following illustration shows the location of the internal drive bays.

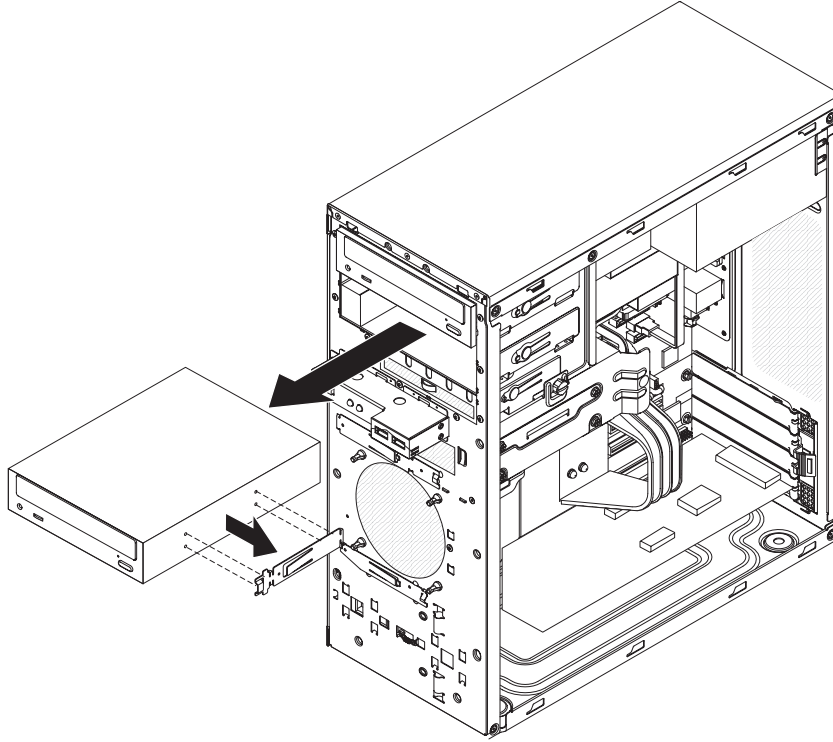


### Notes:

1. A second IDE device that is intended to be cabled to the CD or DVD drive in bay 1 can be installed only in bay 2.
2. Two optional tape drives can be installed in bays 1 and 2.
3. The server supports one optional diskette drive. A diskette drive can be installed only in bay 3.

## Removing a CD or DVD drive

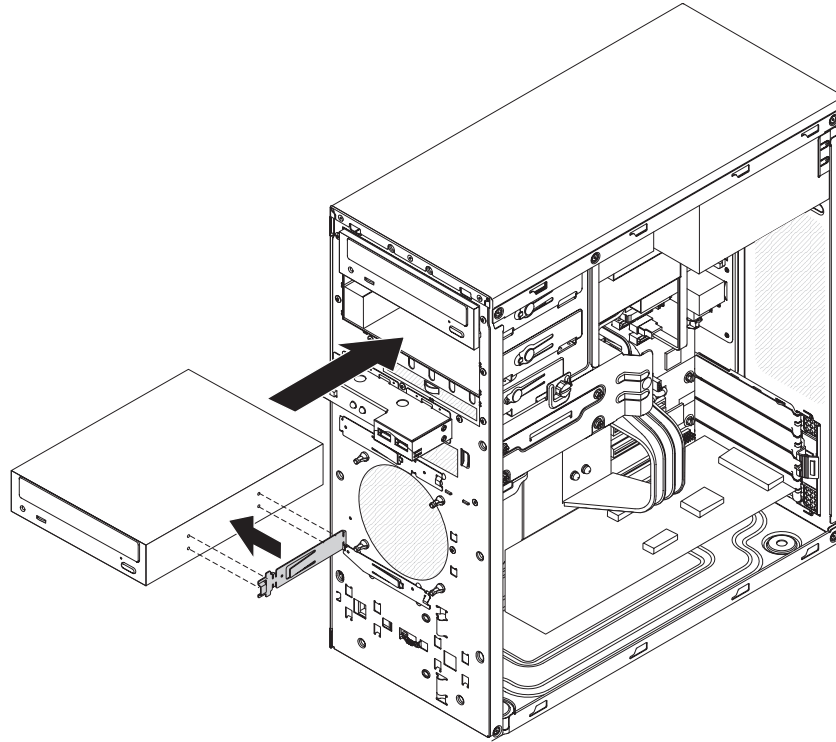
To remove a CD or DVD drive from bays 1 or 2, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and all peripheral devices; then, disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 61).
4. Remove the bezel (see “Removing the bezel” on page 63).
5. Disconnect the cables from the drive that is to be removed.
6. Press the blue latch to release the drive; then, grasp the drive and pull it out of the front of the server.
7. If you are replacing the drive with a new drive, remove the drive retainer clip from the side of the drive and save it for installation on the replacement drive.
8. If you are instructed to return the drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a CD or DVD drive

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



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

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

**Statement 3:**



**CAUTION:**

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

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



**DANGER**

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

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



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

2. Touch the static-protective package that contains the drive to any unpainted metal surface on the server; then, remove the drive from the package and place it on a static-protective surface.
3. 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.

4. Install the blue drive retainer clip into the screw holes on the side of the drive (with the blue side of the clip facing outward).
5. Align the drive assembly with the guide rails in the bay. Push the drive into the bay.

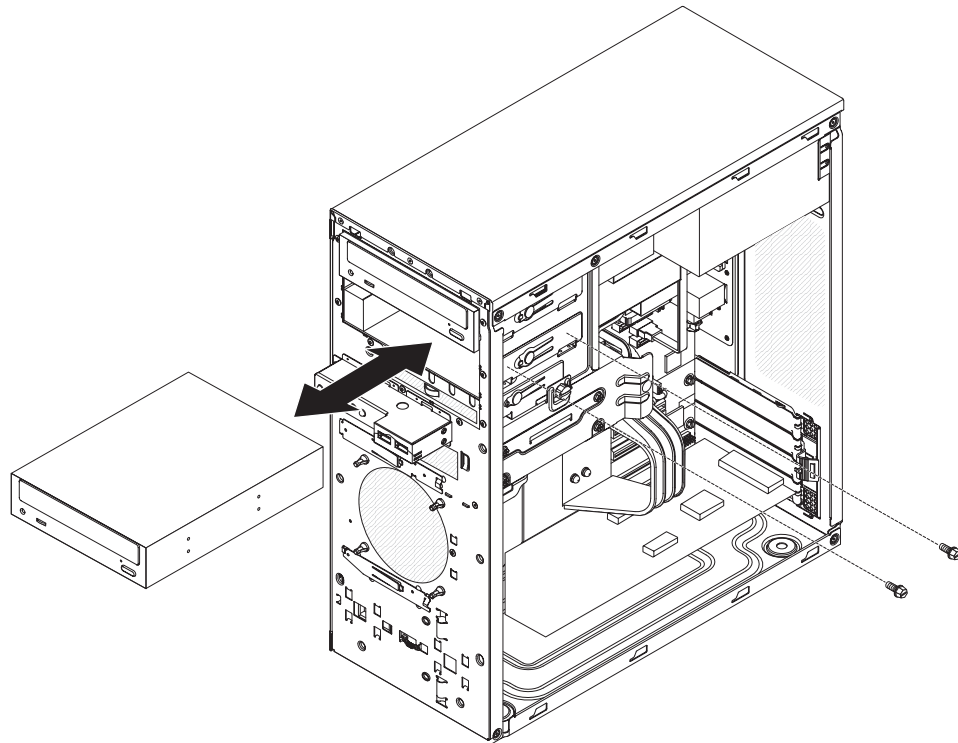
6. Connect one end of the signal cable into the back of the drive and make sure that the other end of this cable is connected into the IDE connector on the system board. See “System-board internal connectors” on page 8 for the connector locations on the system board.

**Note:** Route the signal cable so that it does not block the airflow to the rear of the drives or over the microprocessor.

7. Connect the power cables to the back of the drive. The connectors are keyed and can be inserted only one way.
8. Install the bezel (see “Installing the bezel” on page 64).
9. Install the cover (see “Installing the cover” on page 62).
10. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
11. Turn on the attached devices; then, turn on the server.

### Removing an optional tape drive

To remove a tape drive, complete the following steps.

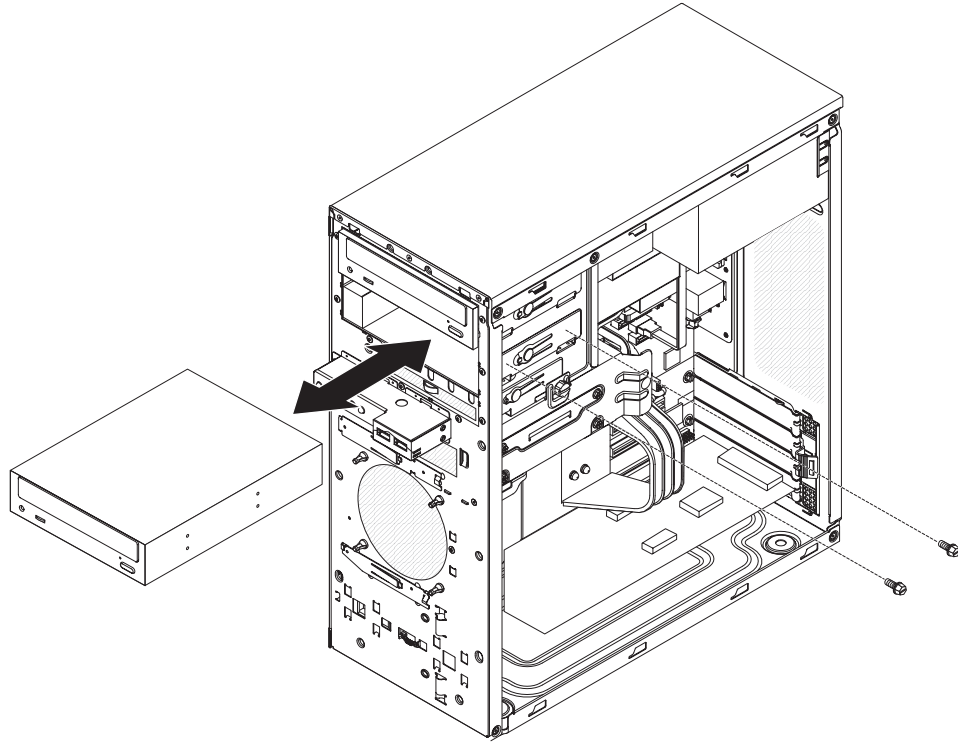


1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and all peripheral devices; then, disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 61).
4. Remove the bezel (see “Removing the bezel” on page 63).
5. Disconnect the cables from the tape drive that is to be removed.
6. Remove the screws from the side of the tape drive; then grasp the tape drive and pull it out of the front of the server. Store the screws in a safe place for reuse later.

7. If you are instructed to return the tape drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

### Installing an optional tape drive

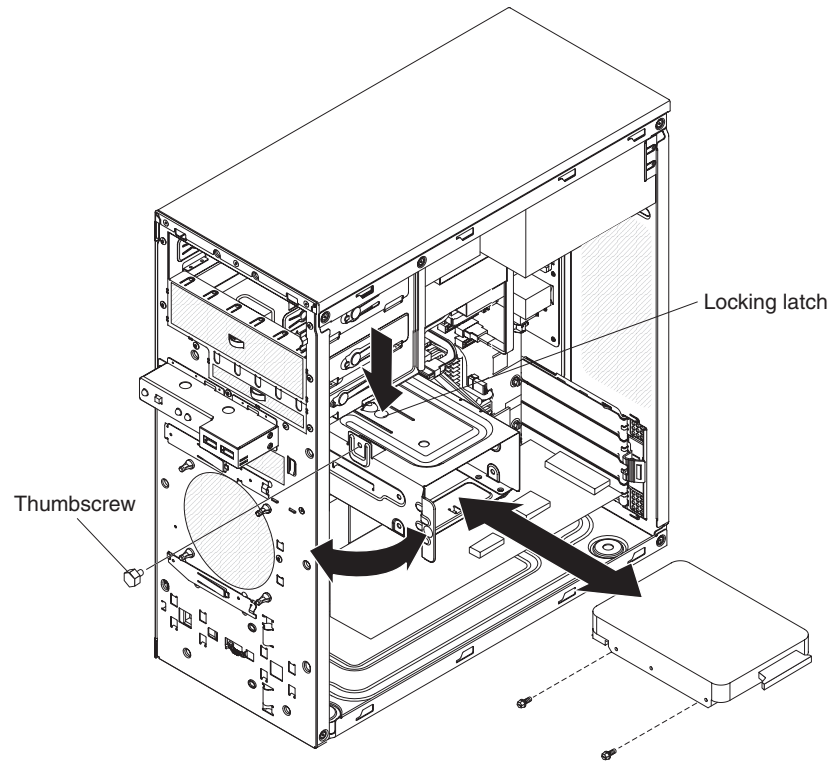
To install a tape drive, complete the following steps.



1. If you are replacing a removed drive with a new drive, make sure that:
  - a. You have all the cables and other equipment that are specified in the documentation that comes with the new tape drive.
  - b. You check the instructions that come with the new drive to determine whether you must set any switches or jumpers on the drive. If you are installing a SCSI device, make sure that you select the SCSI ID for that device.
2. Touch the static-protective package that contains the tape drive to any unpainted metal surface on the server; then, remove the tape drive from the package and place it on a static-protective surface.
3. Slide the tape drive into the drive cage from the front of the server, then connect the IDE cable to the tape drive.
4. Secure the tape drive to the chassis with the supplied screws.
5. Connect the tape drive to the tape drive connectors on the system board.
6. Install the bezel (see "Installing the bezel" on page 64).
7. Install the cover (see "Installing the cover" on page 62).
8. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
9. Turn on the attached devices; then, turn on the server.

## Removing a SATA hard disk drive

To remove a SATA disk drive from bay 4 or 5, complete the following steps.



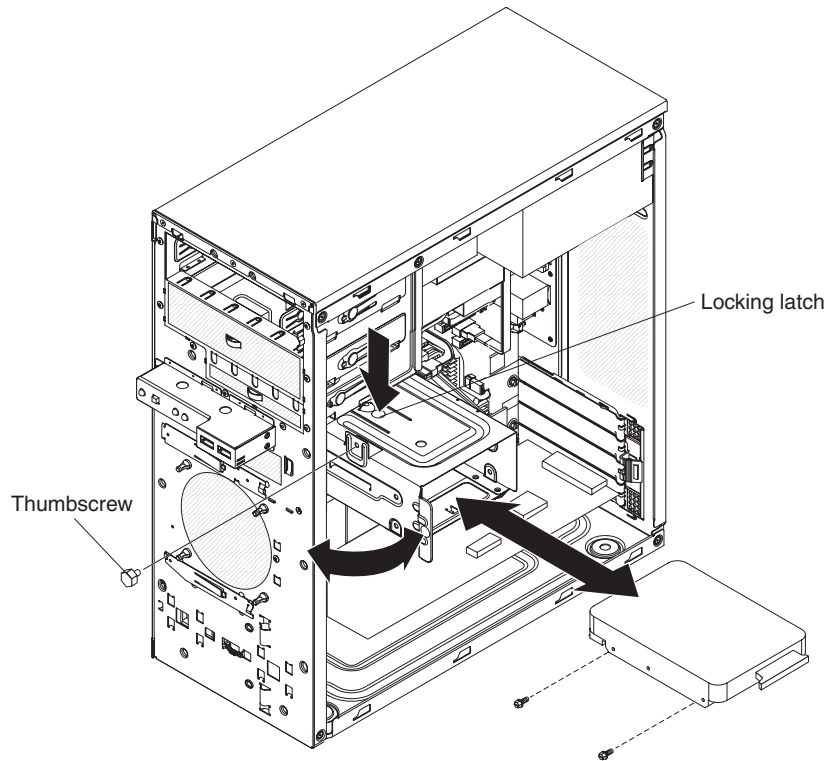
1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and all peripheral devices; then, disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 61).
4. Disconnect the cables from the drive that is to be removed or from both drives in the drive cage, if two drives are installed.
5. Remove the thumbscrew that secures the hard disk drive cage to the chassis.
6. Grasp the hard disk drive cage and rotate it up until it locks into place on the chassis.

**Note:** You can remove the drive cage from the server by lifting up and gently pulling it out of the server. It is not necessary to remove the drive cage to install the drives.

7. Remove the four screws (two on each side) that secure the drive to the drive cage, and slide the drive out of the cage.
8. If you are instructed to return the drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing a SATA hard disk drive

To install a SATA hard disk drive in bay 4 or 5, complete the following steps.



1. Touch the static-protective package that contains the drive to any unpainted metal surface on the server; then, remove the drive from the package and place it on a static-protective surface.
2. Set any jumpers or switches on the drive according to the documentation that comes with the drive.
3. Align the drive assembly with the guide rails in the bay (with the connector end of the drive facing you).
4. Gently slide the drive assembly into the drive bay as far as it will go.
5. Attach the hard disk drive to the drive cage with the four screws.
6. Press in on the locking latch and rotate the drive cage back into the server.
7. Secure the drive cage to the chassis with the blue thumbscrew that you removed earlier.
8. Connect one end of the signal cable into the back of the drive and make sure that the other end of the cable is connected into the connector on the system board. See "System-board internal connectors" on page 8 for the location of the SATA connectors on the system board. If there are open connectors on the cables that connect existing SATA drives, you can use these cables to connect the new drive.
9. Route the signal cable so that it does not block the airflow to the rear of the drives or over the microprocessor and DIMMs.
10. Connect the power cable to the back of the drive. The connectors are keyed and can be inserted only one way.
11. Install the cover (see "Installing the cover" on page 62).
12. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
13. Turn on the attached devices; then, turn on the server.

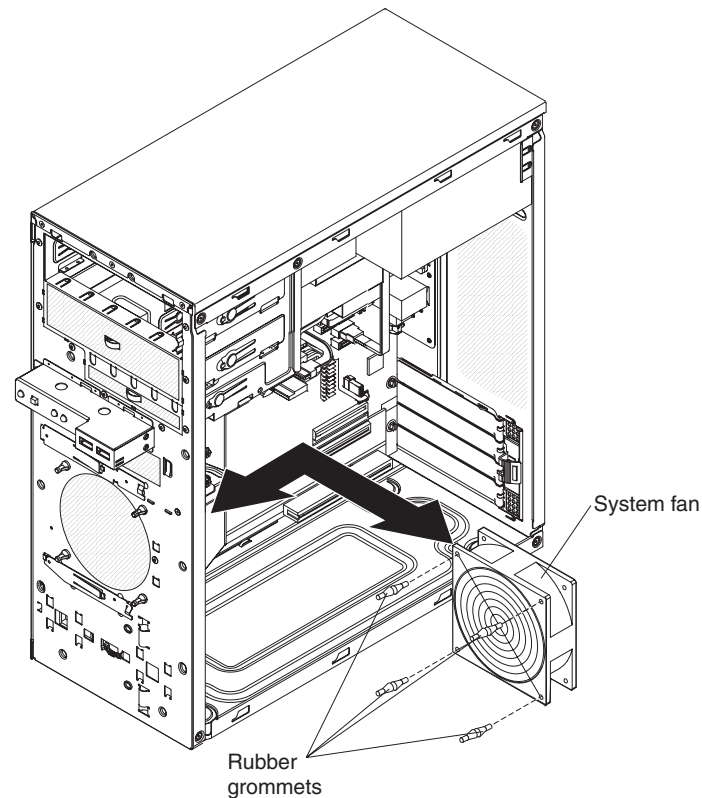


## Removing the system fan

### Attention:

- Replace a failed fan within 48 hours.
- To ensure proper cooling and airflow, do not operate the server for more than 2 minutes with the cover removed.

To remove the system fan, complete the following steps.



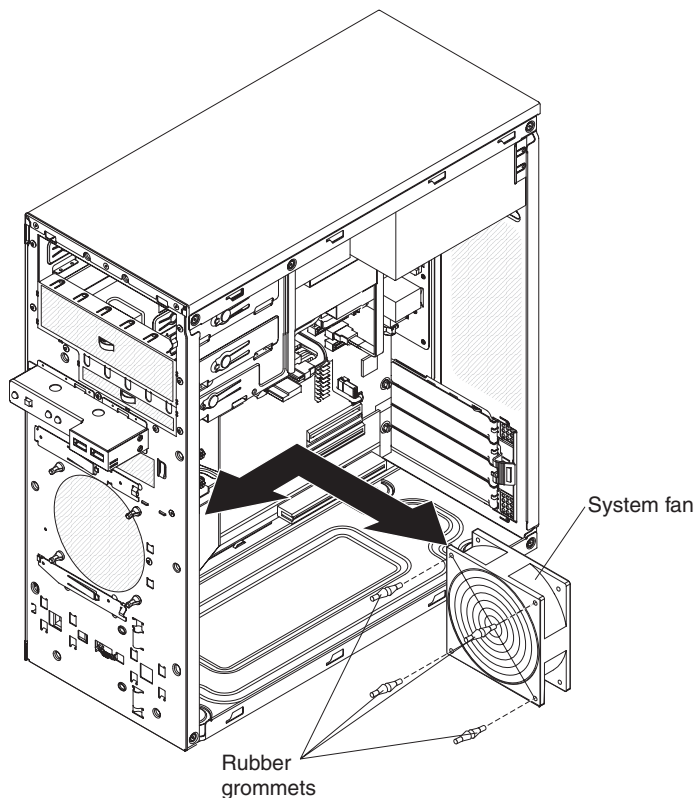
1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and attached devices; then, disconnect all power cords and external cables.
3. Remove the cover (see “Removing the cover” on page 61).
4. Remove the bezel (“Removing the bezel” on page 63).
5. Remove the air baffle:
  - a. Grasp the handle of the air baffle.
  - b. Rotate the air baffle upward and lift it out of the server.
6. Disconnect the fan cable from the system board and make a note where the cable was connected for later installation.
7. Grasp the fan with both hands and pull firmly, extending the rubber grommets. The grommets will be pulled through the holes in either the fan or the chassis and can then be removed.

**Note:** It might be easier to use side cutter to sever the grommets.

8. Pull the fan up and out of the chassis.
9. If you are instructed to return the fan, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the system fan

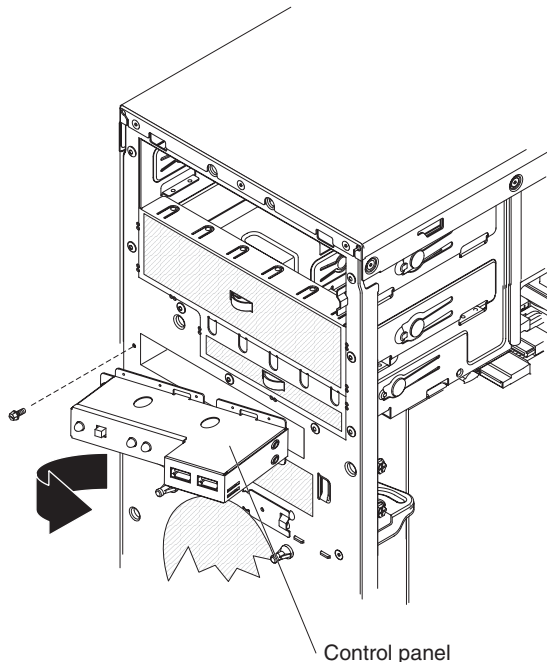
To install the system fan, complete the following steps.



1. Use needle-nosed pliers to pull the grommets through the holes in the replacement fan.
2. Position the fan so that the grommets protrude through the holes in the chassis; then, use needle-nosed pliers to pull the grommets through the holes from outside the chassis.
3. Connect the fan cable to the system board (see "System-board internal connectors" on page 8 for the location of the system fan connector).
4. Install the microprocessor air baffle.
5. Install the bezel (see "Installing the bezel" on page 64).
6. Install the cover (see "Installing the cover" on page 62).
7. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
8. Turn on the attached devices; then, turn on the server.

## Removing the front control panel

To remove the control panel, complete the following steps.



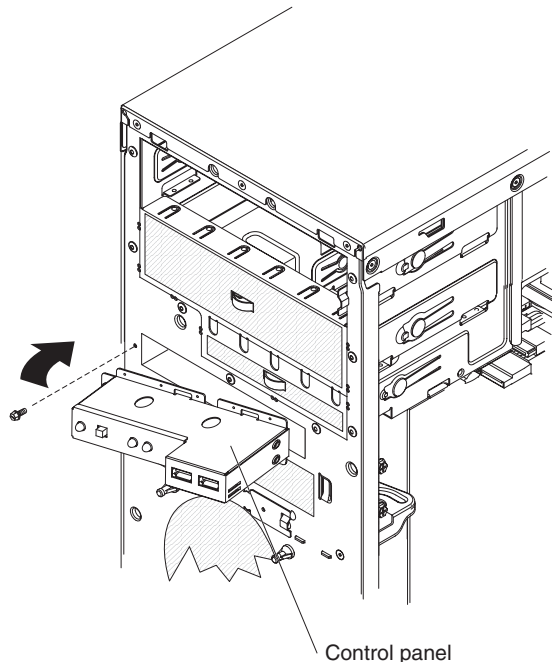
1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and all peripheral devices; then, disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 61).
4. Remove the bezel (see “Removing the bezel” on page 63).

**Note:** It might be helpful to lay the server on its left side for the remainder of this procedure.

5. Lift the microprocessor air baffle out of the server.
6. Remove the drive cage:
  - a. Remove the thumbscrew from the drive cage.
  - b. Rotate the drive cage upward until it is in the open position.
  - c. Lift the drive cage out of the server.
7. Note the routing of the control panel cables; then, disconnect them from the control panel.
8. Remove the screw that attaches the control panel to the chassis.
9. Grasp the left side of the control panel and rotate the control panel to the right until it slips out of the slot on the right side of the panel. Then, pull the control panel away from the server.
10. If you are instructed to return the control panel, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the front control panel

To install the control panel, complete the following steps.



1. Insert the flange on the right side of the control panel assembly into the slot in the front of the chassis; then, rotate the control panel down over the opening.
2. Attach the control panel to the chassis with the screw that you removed earlier.
3. Attach the cables to the control panel.
4. Install the drive cage:
  - a. Slide the drive cage into the drive cage bracket on the chassis.
  - b. Rotate the drive cage downward into the server.
  - c. Install the thumbscrew that you removed earlier.
5. Install the microprocessor air baffle.
6. Install the bezel (see "Installing the bezel" on page 64).
7. Install the cover (see "Installing the cover" on page 62).
8. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
9. Turn on the attached devices; then, turn on the server.

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## Removing and replacing FRUs

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

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

### Removing the power supply

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

**Statement 8:**



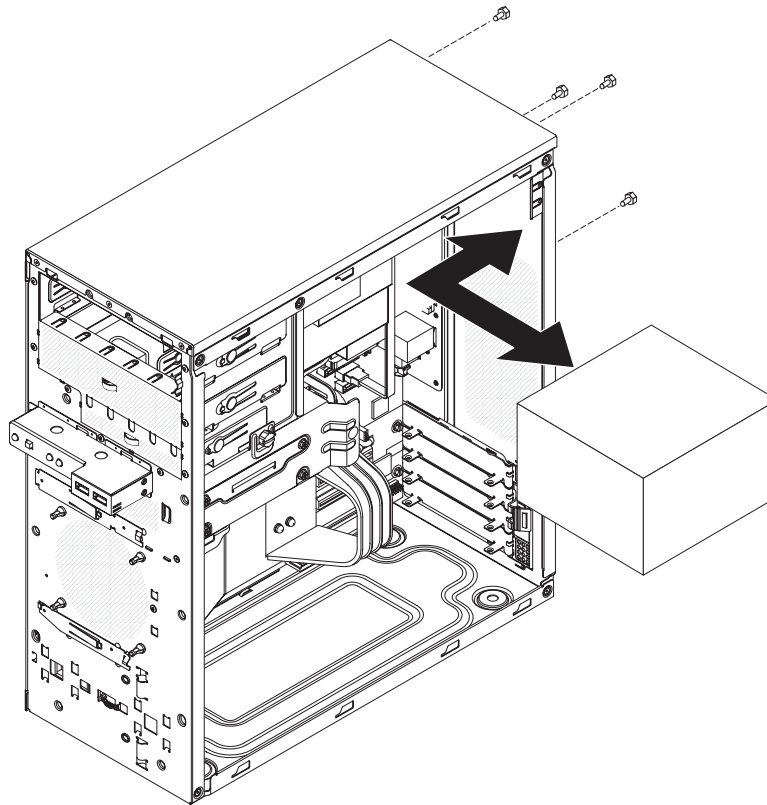
**CAUTION:**

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



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

To remove the power supply, complete the following steps.



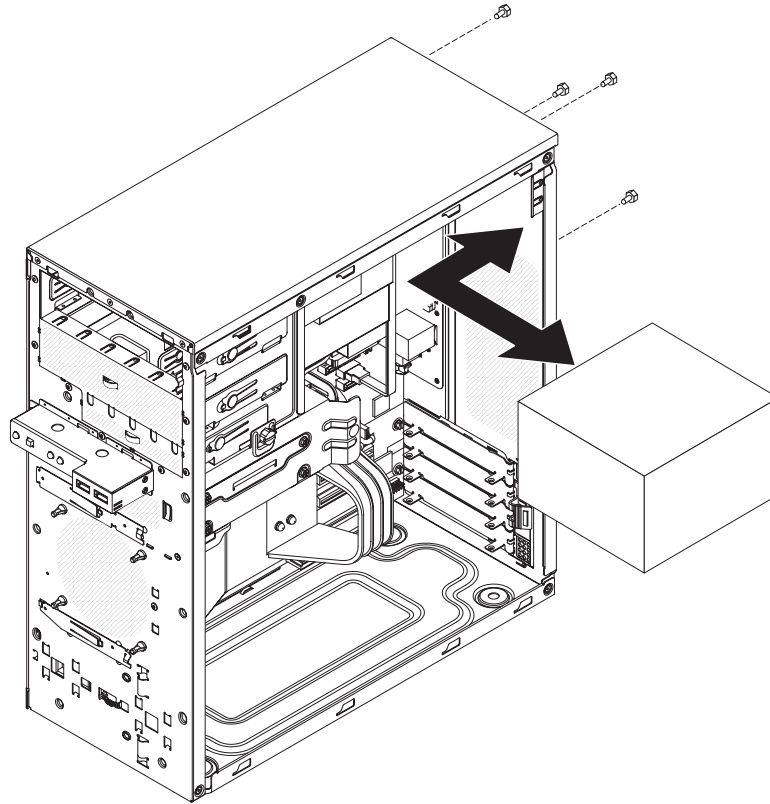
1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and all peripheral devices; then, disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 61).

**Note:** It might be helpful to lay the server on its right side for the remainder of this procedure.

4. Disconnect the cables from the power supply to the system board and all internal components.
5. To provide extra space for the power-supply removal, use the following procedure:
  - Slide the drives in bay 1 and bay 2 (if any are installed) forward slightly (see “Removing a CD or DVD drive” on page 72 for more information). It is not necessary to remove these drives.
  - Lift the microprocessor air baffle out of the server.
  - Remove the microprocessor heat sink (see “Removing the microprocessor and heat sink” on page 86). It is not necessary to remove the microprocessor.
  - Remove any DIMMs in DIMM connectors 3 and 4 (see “Removing a memory module” on page 67).
6. Remove the four screws that secure the power supply to the chassis.
7. Slide the power supply toward the front of the chassis until it clears the mounting bracket; then, tilt the power supply toward the system board and carefully pull it out of the server.
8. If you are instructed to return the power supply, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the power supply

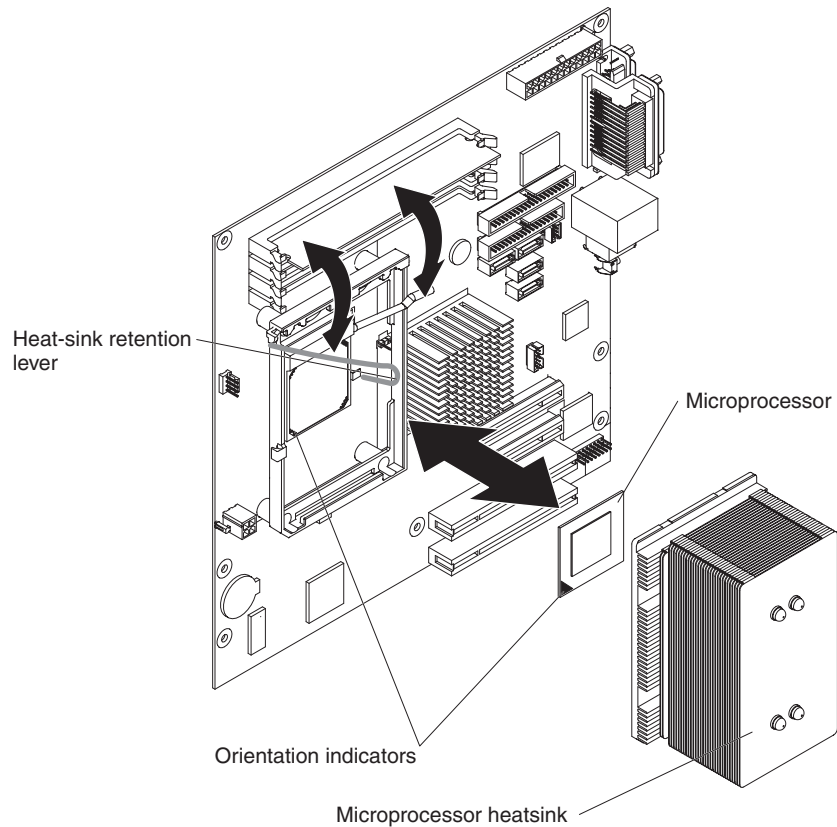
To install the power supply, complete the following steps.



1. Carefully insert the power supply into the chassis; then, position it on the mounting bracket and slide to the rear of the chassis.
2. Install the four screws that secure the power supply to the chassis.
3. Install any of the following components that were removed:
  - Push the drives in bay 1 and bay 2 fully into the bays (see “Installing a CD or DVD drive” on page 73 for more information).
  - Install the microprocessor heat sink (see “Installing the microprocessor and heat sink” on page 88).
  - Install any DIMMs that you removed from DIMM connectors 3 and 4 (see “Installing a memory module” on page 68).
  - Install the microprocessor air baffle.
4. Reconnect the cables from the power supply to the system board and all internal components.
5. Install the cover (see “Installing the cover” on page 62).
6. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
7. Turn on the attached devices; then, turn on the server.

## Removing the microprocessor and heat sink

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



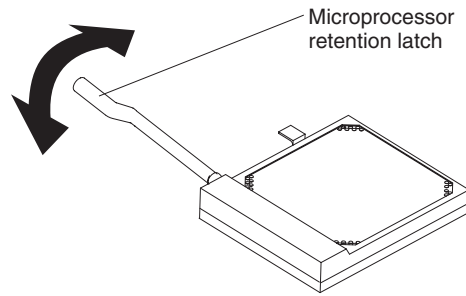
1. Read the safety information that begins on page vii and "Installation guidelines" on page 59.
2. Turn off the server and all attached devices; then, disconnect the power cords and all external cables.
3. Turn the server on its side so that it is lying flat, with the cover facing up.
4. Remove the cover (see "Removing the cover" on page 61).
5. Lift the microprocessor air baffle out of the server.
6. Disconnect any cables that impede access to the heat sink and microprocessor.

**Attention:** The heat-sink retention lever is spring-loaded when the heat sink is in place. Releasing the lever too quickly or allowing it to spring upward can damage the heat sink and surrounding components.

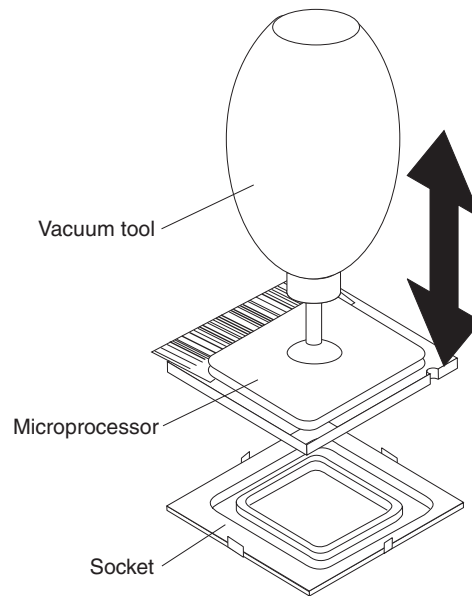
7. Release the heat-sink retention lever by pressing down on the end, moving it to the slide and slowly releasing it to the open (up) position.
8. Tip the top of the heat sink toward the rear of the server while you slide it away from the lower flange of the retention module; then, remove it from the server. After removal, place the fan sink on its side on a clean, flat surface
9. Release the microprocessor retention latch by pressing down on the end, moving it to the side, and slowly releasing it to the open (up) position.

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





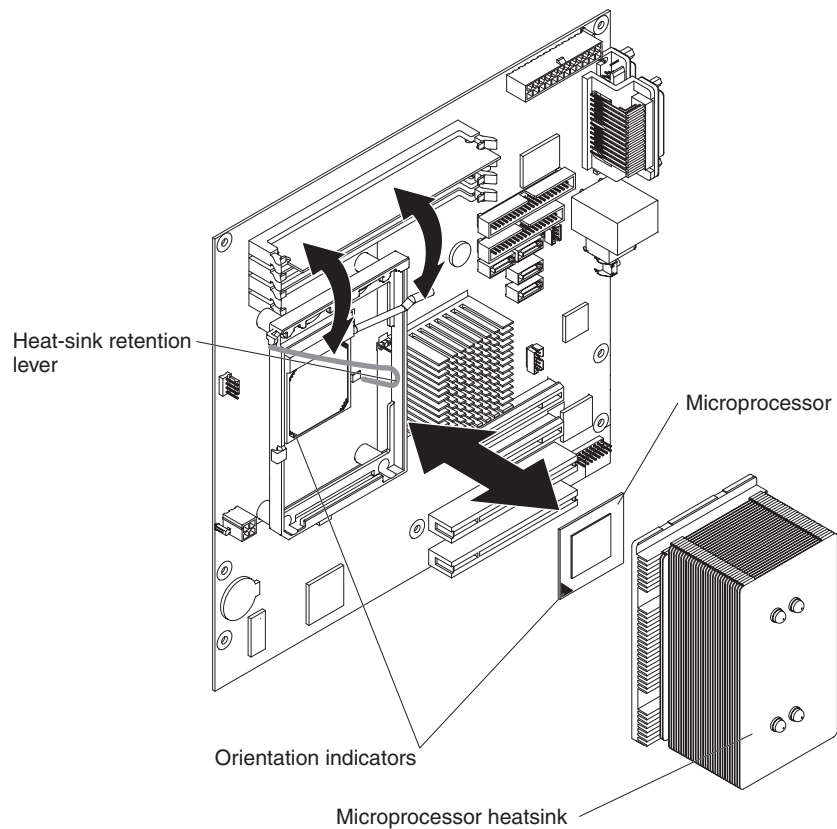
10. Remove the microprocessor by using the vacuum tool and completing the following steps.



- a. Squeeze and hold the bladder of the tool; then, place the suction cup on the microprocessor and release the bladder.
  - b. Using the tool, carefully lift the microprocessor straight up and out of the socket, and place it on a static-protective surface.
  - c. Squeeze the bladder of the tool to release the microprocessor from the suction cup.
11. If you are instructed to return the heat-sink assembly and microprocessor, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the microprocessor and heat sink

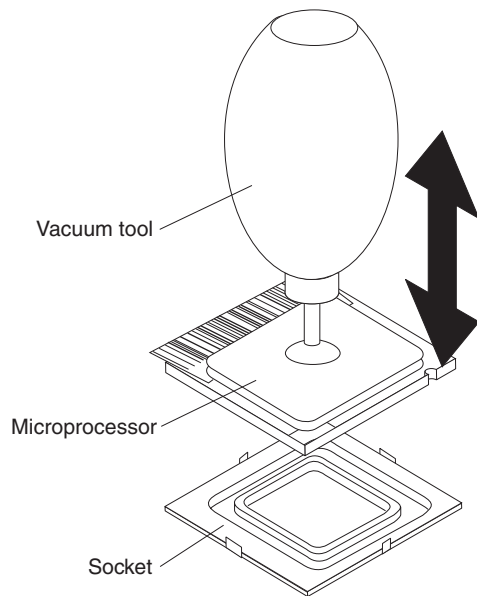
To install the microprocessor and heat sink, complete the following steps.



1. Make sure that the microprocessor socket lever is in the fully open position.

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

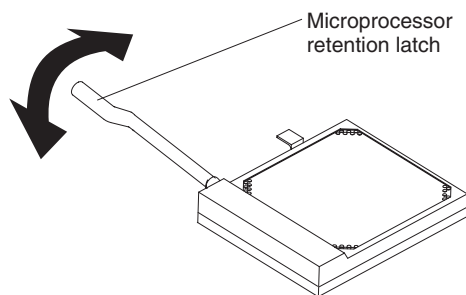
2. Install the microprocessor by using the vacuum tool and completing the following steps.



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

**Note:** To maintain the correct orientation between the microprocessor and the microprocessor socket during installation, align the triangle-shaped indicator on one corner of the microprocessor with the 45-degree angle on one corner of the socket.

- b. Using the tool, carefully place the microprocessor into the socket.
  - c. Squeeze the bladder of the tool to release the microprocessor from the suction cup.
3. Close the microprocessor retention latch and lock it securely in place.



4. Install the heat sink:
  - a. Make sure that the heat-sink retention lever is in the fully open position.

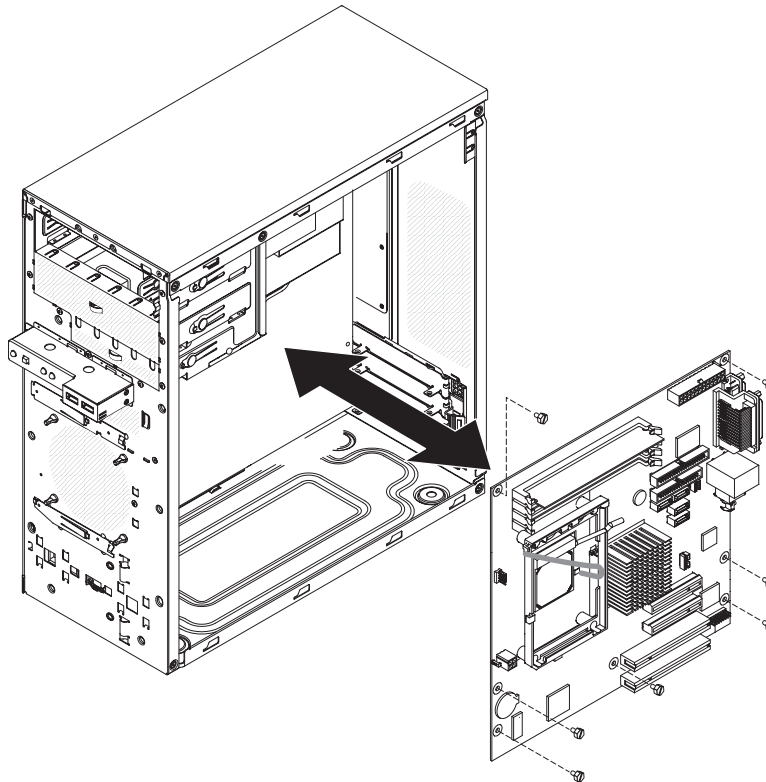
**Important:** Be careful when you handle the microprocessor and heat sink. Do not contaminate the thermal material between them.

- b. Slide the bottom edge of the heat sink under the lower flange of the retention module; then, place the top of the heat sink onto the top of the retention module.
  - c. Close the heat-sink retention lever and lock it securely in place.
5. Reconnect any cables that you disconnected during removal of the microprocessor.
  6. Install the microprocessor air baffle.

7. Install the cover (see “Installing the cover” on page 62).
8. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
9. Turn on the attached devices; then, turn on the server.

## Removing the system board

To remove the system board, complete the following steps.

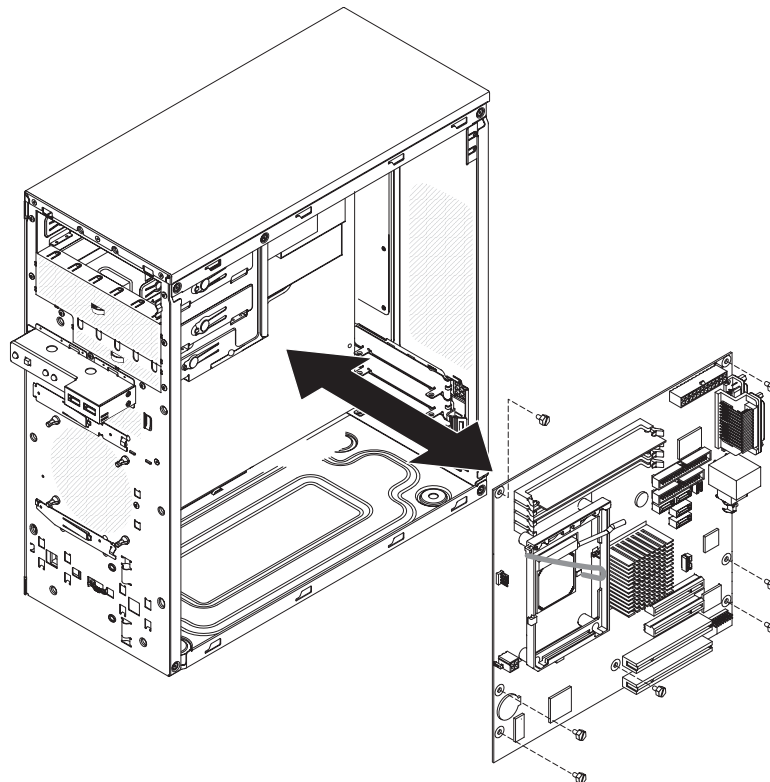


1. Read the safety information that begins on page vii and “Installation guidelines” on page 59.
2. Turn off the server and all attached devices; then, disconnect the power cords and all external cables.
3. Remove the cover (see “Removing the cover” on page 61).  
**Attention:** Do not place any strain on the cables that are connected to the drives in the drive cage; if necessary, disconnect these cables from the drives before you remove the drive cage.
4. Remove the drive cage:
  - a. Remove the thumbscrew from the drive cage.
  - b. Rotate the drive cage upward until it is in the open position.
  - c. Lift the drive cage out of the server.
5. Note where each cable is connected; then, disconnect all cables from the system board.
6. Remove any of the following components that are installed on the system board and put them in a safe, static-protective place:
  - Adapters (see “Removing an adapter” on page 65)
  - Microprocessor and heat-sink (see “Removing the microprocessor and heat sink” on page 86)

- DIMMs (see “Removing a memory module” on page 67)
  - Battery (see “Removing the battery” on page 69)
7. Remove the seven screws that secure the system board to the chassis.
  8. Slide the system board toward the front of the server to disengage the tabs in the chassis; then, carefully lift the system board out of the server.
  9. If you are instructed to return the system board, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

## Installing the system board

To install the system board, complete the following steps.



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

**Note:** The tabs are fully engaged when the screw holes in the system board are aligned with the corresponding holes in the chassis.

2. Install the seven screws that secure the system board to the chassis.
3. Install any of the following components that you removed from the system board:
  - Battery (see “Installing the battery” on page 69)
  - DIMMs (see “Installing a memory module” on page 68)
  - Microprocessor and heat sink (see “Installing the microprocessor and heat sink” on page 88)
  - Adapters (see “Installing an adapter” on page 66)
4. Reconnect any cables to the system board that you disconnected during removal.
5. Install the drive cage:

- a. Slide the drive cage into the drive cage bracket on the chassis.
  - b. Rotate the drive cage downward into the chassis.
  - c. Install the thumbscrew that you removed earlier.
  - d. Reconnect any cables to the drives in the drive cage that you disconnected during removal.
6. Install the microprocessor air baffle.
7. Install the cover (see "Installing the cover" on page 62).
8. Reconnect the external cables and power cords to the server; then, connect the power cords to electrical outlets.
9. Turn on the attached devices; then, turn on the server.
10. Start the Configuration/Setup Utility program and reset the configuration:
  - a. Set the system date and time.
  - b. Set the passwords, if necessary.
  - c. Save the configuration.
11. Update the BIOS and VPD code (see "Updating the firmware" on page 93).

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## Chapter 5. Configuration information and instructions

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

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### Updating the firmware

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

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

- BIOS code is stored in read-only memory (ROM) on the system board.
- Ethernet firmware is stored in ROM on the Ethernet controller on the system board.
- Major components contain VPD code. You can select to update the VPD code during the BIOS code update procedure.

---

### Configuring the server

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

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

- Configuration/Setup Utility program
- Boot Menu program
- Broadcom NetXtreme Gigabit Ethernet Boot Agent
- Ethernet controller configuration

For more information about these programs, see “Configuring 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 optional hardware devices that are installed, configure the server hardware, provide device drivers, and help you install the operating system. For information about the supported operating-system versions, see the label on the CD. If the *ServerGuide Setup and Installation* CD did not come with the server, you can download the latest version from <http://www.ibm.com/pc/qtechinfo/MIGR-4ZKPPT.html>.

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

1. Insert the CD, and restart the server. If the CD does not start, see “ServerGuide problems” on page 37.
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 copy of the operating-system CD.

## Using the Configuration/Setup Utility program

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

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

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

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

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

## Using the Boot Menu program

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

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

1. Turn off the server.
2. Restart the server.
3. Press F12.
4. Select the startup device.

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



## Enabling the Broadcom NetXtreme Gigabit Ethernet Boot Agent

The Broadcom NetXtreme Gigabit Ethernet Boot Agent is part of the BIOS. You can use it to configure the network as a startable device, and you can customize where the network startup option 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. Turn on the server.
2. When the prompt Press F1 for Configuration/Setup is displayed during startup, press F1.
3. From the Configuration/Setup Utility main menu, select **Devices and I/O Ports** and press Enter.
4. Select **System Board Ethernet PXE/DHCP** and press the Right Arrow (→) key to set it to **Enabled**.
5. Select **Save Settings** and press Enter.

## Configuring the Broadcom NetXtreme Gigabit Ethernet controller

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

You do not have to set any jumpers or configure the controller. However, you must install a device driver when you install a different operating system to enable the operating system to address the controller. For device drivers and information about configuring the Gigabit Ethernet controller, go to <http://www.ibm.com/servers/eserver/support/xseries/index.html>.



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## Appendix A. Getting help and technical assistance

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

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### Before you call

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

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

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The documentation that comes with your system also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that contain 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.

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### Using the documentation

Information about your IBM system and preinstalled software, if any, and optional devices 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/servers/eserver/support/xseries/index.html> and follow the instructions. Also, some documents are available through the IBM Publications Center at <http://www.ibm.com/shop/publications/order/>.

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

On the World Wide Web, the IBM Web site has up-to-date information about IBM 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 IntelliStation® information is <http://www.ibm.com/intellistation>.

You can find service information for your IBM systems and optional devices at <http://www.ibm.com/servers/eserver/support/xseries/index.html>

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## 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).

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## Hardware service and support

Important: When you call for service, you will be asked to provide the four-digit machine type of your system which is 4347.

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

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

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## 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

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## Appendix B. Notices

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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		

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## Important notes

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

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

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

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

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

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

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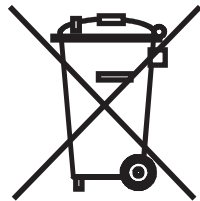
Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

---

## Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.

Esta unidad debe reciclarse o desecharse de acuerdo con lo establecido en la normativa nacional o local aplicable. IBM recomienda a los propietarios de equipos de tecnología de la información (TI) que reciclen responsablemente sus equipos cuando éstos ya no les sean útiles. IBM dispone de una serie de programas y servicios de devolución de productos en varios países, a fin de ayudar a los propietarios de equipos a reciclar sus productos de TI. Se puede encontrar información sobre las ofertas de reciclado de productos de IBM en el sitio web de IBM <http://www.ibm.com/ibm/environment/products/prp.shtml>.



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

This appliance is labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

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

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

L'étiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.



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## Battery return program

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

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

For Taiwan: Please recycle batteries.



### For the European Union:



**For California:** Perchlorate material – special handling may apply. See <http://www.dtsc.ca.gov/hazardouswaste/perchlorate/>.

The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials. This product/part may include a lithium manganese dioxide battery which contains a perchlorate substance.

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## Electronic emission notices

IBM System x3105 Type 4347

### Federal Communications Commission (FCC) statement

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this

equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

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

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

Responsible party:

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



Tested To Comply  
With FCC Standards

FOR HOME OR OFFICE USE

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

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

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

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

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

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

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

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。  
取扱説明書に従って正しい取り扱いをして下さい。



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