Lotus Foundations Appliance, Type 9234 CNU and 9234 DNU

Problem Determination and Service Guide

Lotus Foundations Appliance, Type 9234 CNU and 9234 DNU

Problem Determination and Service Guide

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

Guidelines for trained service technicians

This section contains information for trained service technicians.

Inspecting for unsafe conditions

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

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

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

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

1. Make sure that the power is off and the power cord is disconnected.
2. Make sure that the exterior cover is not damaged, loose, or broken, and observe any sharp edges.
3. Check the power cord:
   - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
   - Make sure that the power cord is the correct type, as specified in “Power cords” on page 22.
   - Make sure that the insulation is not frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Guidelines for servicing electrical equipment

Observe the following guidelines when you service electrical equipment:

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

Safety statements

Important:

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

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

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

Statement 1:

DANGER

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

To avoid a shock hazard:

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

To Connect:	**To Disconnect:**
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

Statement 2:

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

Do not:

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

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

Statement 4:

≥ 18 kg (39.7 lb)

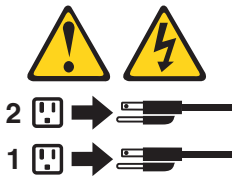
≥ 32 kg (70.5 lb)

≥ 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.


2
1

Statement 8:

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

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

Statement 12:

CAUTION:
The following label indicates a hot surface nearby.

Statement 13:

DANGER

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

Statement 15:

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

German Ordinance for Work gloss statement

The product is not suitable for use with visual display work place devices according to clause 2 of the German Ordinance for Work with Visual Display Units.

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

Chapter 1. Introduction

This guide is intended for use by a knowledgeable and trained hardware technician. It is not intended to be used by an untrained end user of the Lotus Foundations Appliance. Please contact your reseller or IT service provider or contact IBM support at 1–866–384–8324 option 2.

The *Problem Determination and Service Guide* contains information to help you solve problems that might occur in the IBM Lotus Foundations Appliance, Type 9234 CNU and 9234 DNU. It describes the diagnostic tools that come with the server, error codes and suggested actions, and instructions for replacing failing components.

Replaceable components are of three types:

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

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document, included with the Lotus Foundations Appliance.

Related documentation

In addition to this document, the following documentation also comes with the Lotus Foundations Appliance:

- Important Information and Pointer Flyer
- Important Information Flyer (green)
- pDSA CD

A documentation CD is also provided and contains the following:

- Lotus Foundations Appliance Quick Start Guide
- Warranty and Support Manual
- IBM Safety Manual

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

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

1. Go to http://www-01.ibm.com/software/lotus/support/
2. Under Search Lotus support, enter the search term ″Foundations Hardware″.

3. In the search results, select the document ″Certified and Supported Hardware Types for Lotus Foundations″.
4. Verify the hardware type in-use. Search via the indicated Foundations Knowledge Base link(s) for more detailed information.

Notices and statements in this document

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

The following notices and statements are used in this document:

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

Features and specifications

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

Table 1. Features and specifications

Microprocessor:
- Supports one Intel® E7200 microprocessor, 1066 MHz/3M, 2.53 GHz dual-core or one Intel X3330 microprocessor, 1333 MHz/6M, 2.66 GHz quad-core

Memory:
- Minimum: 2 GB
- Maximum: 8 GB
- Types: PC2-5300 or PC2-6400, ECC unbuffered double-data-rate 2 (DDR2) 667 or 800 MHz SDRAM
- Connectors: four dual inline memory module (DIMM) connectors, two-way interleaved

Drives (depending on the model):
- Hard disk drive: Simple-swap SATA (250 GB or 500 GB)
- Hotswappable idb drive for backup (1 TB)

-

Drive bays:
- Two 5.25 in. half-high bays (one LCD display and one idb drive installed)
- Four 2.5 in. slim-high hard disk drive bays

Fans:
Three speed-controlled fans.

Power supply:
- One non-redundant 401-watt (90-240 V ac)

Size:
- Height: 438 mm (17.25 in.)
- Depth: 540 mm (21.25 in.)
- Width: 216 mm (8.5 in.)
- Weight: 16.3 kg (36 lb) to 25.2 kg (56 lb) depending upon configuration

Integrated functions:
- Mini-baseboard management controller (mini-BMC)
- Broadcom BCM5722 10/100/1000 Ethernet controller on the system board with RJ-45 Ethernet port
- One internal single-channnel (four ports per channel) SAS/SATA controller (mini-PCI slot)
- Two serial ports
- One parallel port
- Six-port Serial ATA controller
- Eight Universal Serial Bus (USB) v2.0 ports (two on front and four on rear, one internal for optional tape drive, and one internal for optional Remote Supervisor Adapter II SlimLine)
- Onboard ATI ES1000 video controller
  - Compatible with SVGA and VGA
  - 64 MB DDR2 SDRAM video memory
  - LCD display
  - Interposer card
  - 512 MB IDE PATA flash card (DOM)
  - Removable idb hard drive kit
  - Dual port PCI 1000 Ethernet card

Diagnostic LEDs:
- Fans
- Hard disk drives
- Memory
- Microprocessor
- PCI slots
- Power supply
- VRD

Acoustical noise emissions:
- Sound power, idling: 5.0 bel
- Sound power, operating: 5.3 bel

Environment:
- Air temperature:
  - Server on: 10° to 35°C (50° to 95°F) Altitude: 0 to 914.4 m (3000 ft)
  - Server on: 10° to 32°C (50° to 89.6°F) Altitude: 914.4 m (3000 ft) to 2133.6 m (7000 ft)
  - Server off: 10° to 43°C (50° to 109.4°F) Maximum altitude: 2133.6 m (7000 ft)
  - Shipping: -40° to 60°C (-40° to 140°F)
- Humidity (operating and storage):
  - Server on: 8% to 80%
  - Server off: 8% to 80%

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

Electrical input:
- Sine-wave input (50 or 60 Hz) required
- Input voltage and frequency ranges automatically selected
- Input voltage low range:
  - Minimum: 100 V ac
  - Maximum: 127 V ac
- Input voltage high range:
  - Minimum: 200 V ac
  - Maximum: 240 V ac
- Input kilovolt-amperes (kVA) approximately:
  - Minimum: 0.20 kVA (all models)
  - Maximum: 0.55 kVA

Notes:

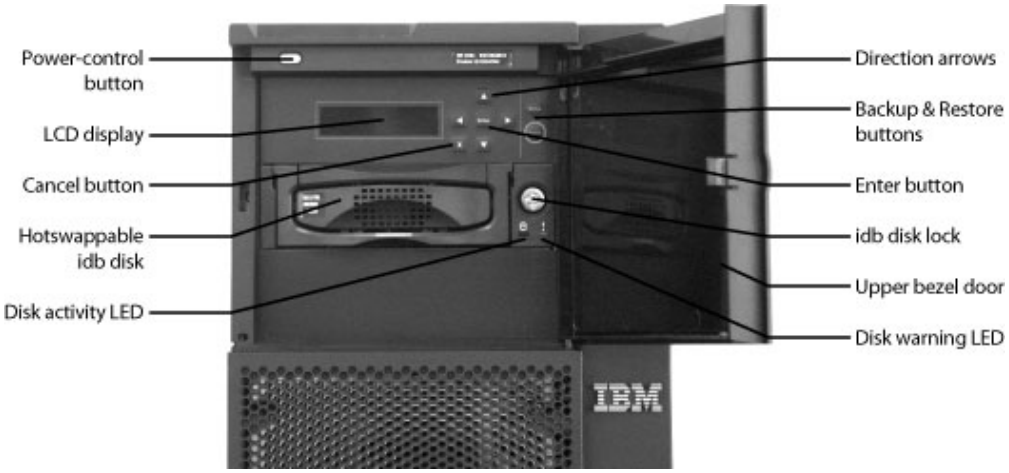
1. Power consumption and heat output vary depending on the number and type of optional features that are installed and the power-management optional features that are in use.
2. These levels were measured in controlled acoustical environments according to the procedures specified by the American National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

Server controls, LEDs, and power

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

Front view

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



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

LCD display
Displays basic server status information and can be used with the control panel buttons, to configure basic server settings.

Cancel button
Cancels actions performed on the LCD control panel and can be used for navigating out of menu options.

Hotswappable idb disk
Performs full and incremental backups of server settings and data.

Disk activity LED
When this green LED is lit, it indicates that the idb disk is in use, either performing a backup of data or restoring data. This activity light will also flicker during startup and shutdown of the server.

Direction arrow
Used to navigate through the LCD display settings and can also be used to adjust specific settings such as IP address configuration.

Backup & Restore buttons
These buttons can be used to initiate either a server backup or restore from the control panel, in the event that WebConfig is inaccessible.

Enter button
Use for navigation and configuration of the LCD display.

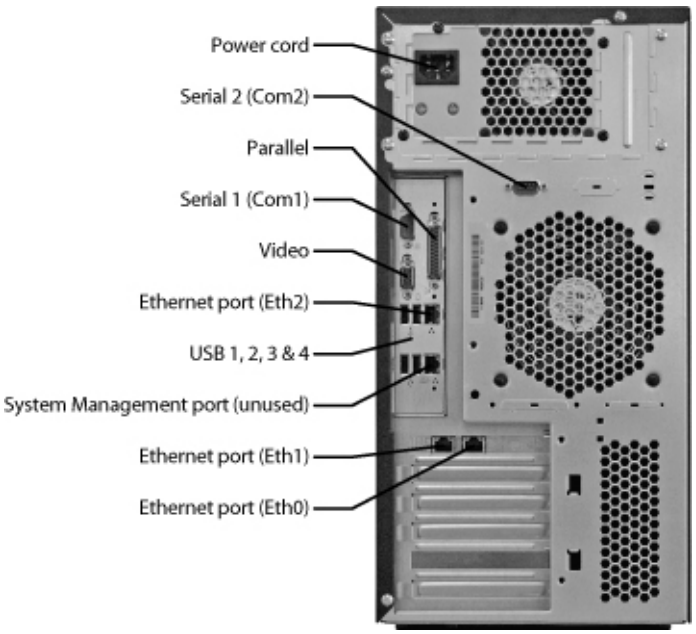
idb disk lock
Locks the idb disk into place. Backup and restore procedures will not work if the idb disk is not locked.

Upper bezel door

Covers the LCD display and control panel, and the hotswappable idb disk.

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.

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

Parallel connector
Connect a parallel device to this connector.

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

Video connector
Connect a monitor to this connector.

USB connectors
Connect USB devices to these connectors.

Ethernet connectors
Use this connector to connect the server to a network. Eth0 is dedicated to LAN usage, while Eth1 and Eth2 are dedicated to Internet connectivity.

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

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

Server power features

When the server is connected to an ac power source but is not turned on, the operating system does not run, and all core logic except the service processor is

shut down; however, the server can respond to requests from the service processor, such as a remote request to turn on the server. The power-on LED flashes to indicate that the server is connected to ac power but not turned on.

Turning on the server

Approximately 20 seconds after the server is connected to ac power, the power-control button becomes active, and one or more fans might start running to provide cooling while the server is connected to power. You can turn on the server and start the operating system by pressing the power-control button. Or, if a power failure occurs while the server is turned on, the server will restart automatically when power is restored.

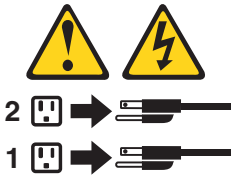
Turning off the server

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

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

Statement 5:

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



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

- You can turn off the server from the operating system, if your operating system supports this feature. After an orderly shutdown of the operating system, the server will be turned off automatically.
- You can press the power-control button to start an orderly shutdown of the operating system and turn off the server, if your operating system supports this feature.
- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the server.
- If an optional Remote Supervisor Adapter II SlimLine is installed in the server, the server can be turned off from the Remote Supervisor Adapter II SlimLine user interface.
- If the Wake on LAN feature turned on the server, the Wake on LAN feature can turn off the server.

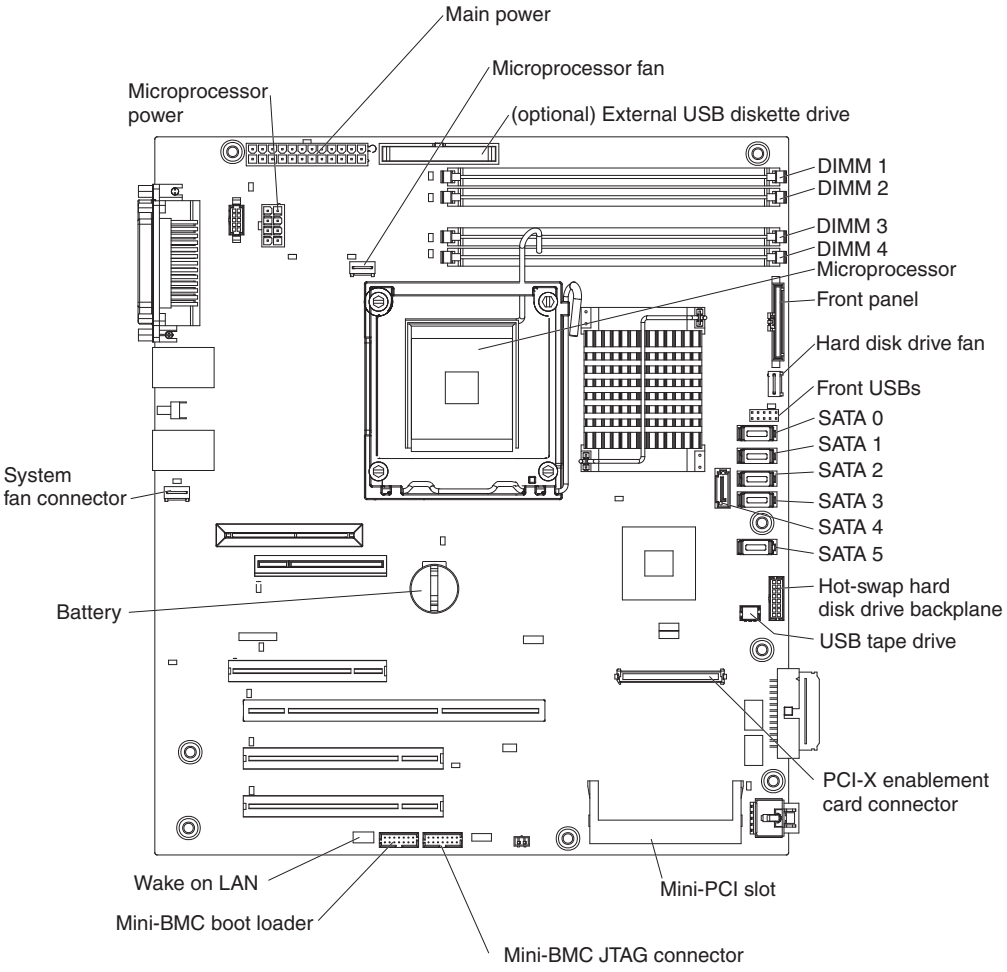
- The server can turn itself off as an automatic response to a critical system failure.

Connectors, LEDs, and jumpers

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

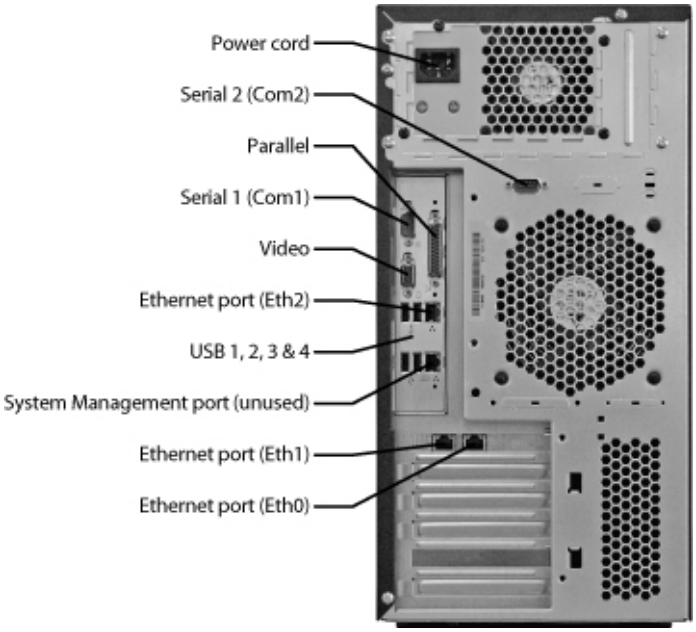
System-board internal connectors

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



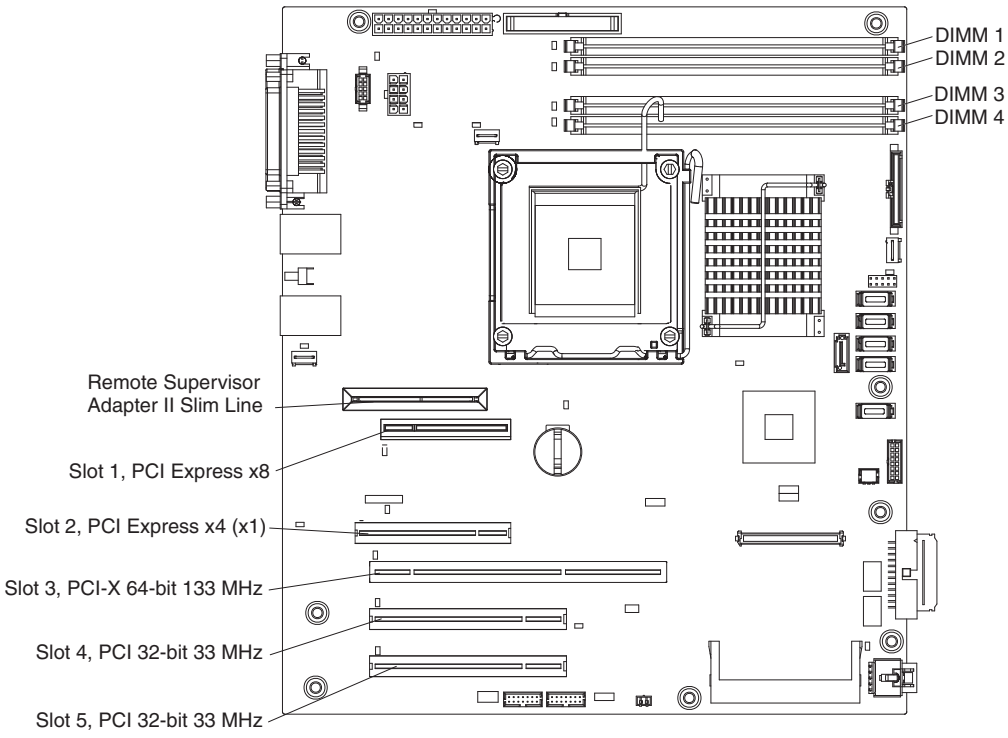
System-board external connectors

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



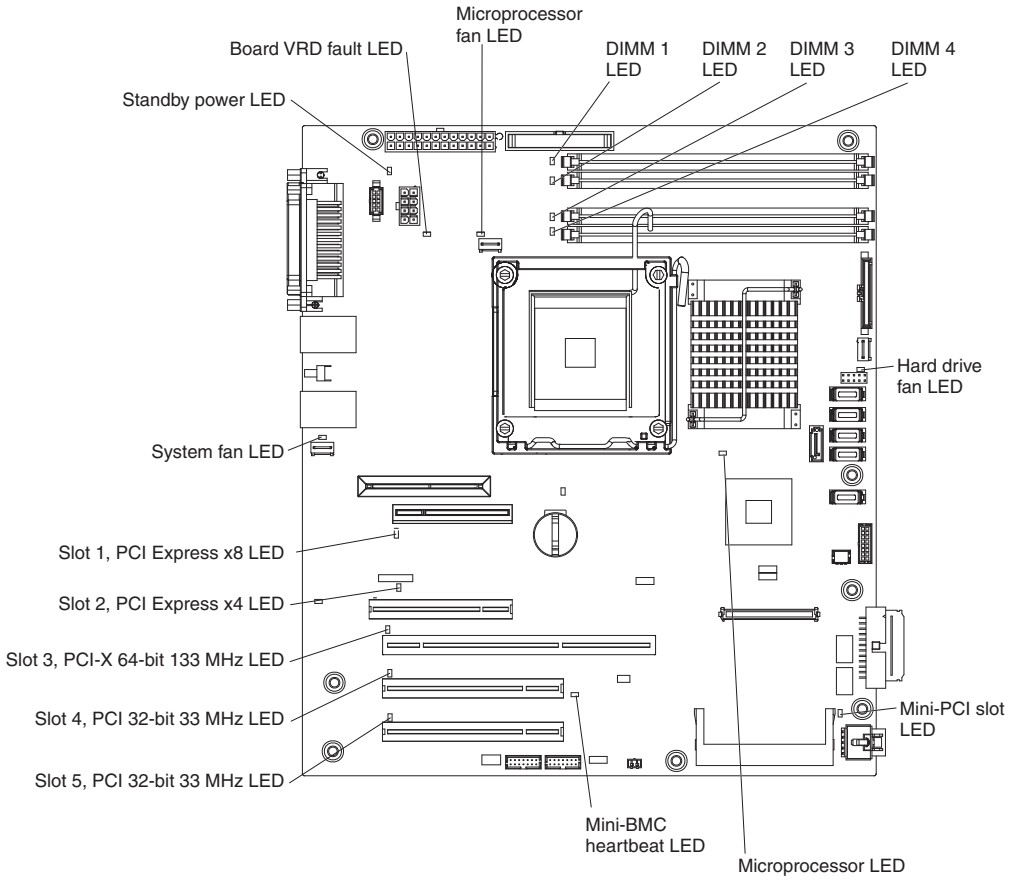
System-board optional-devices connectors

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



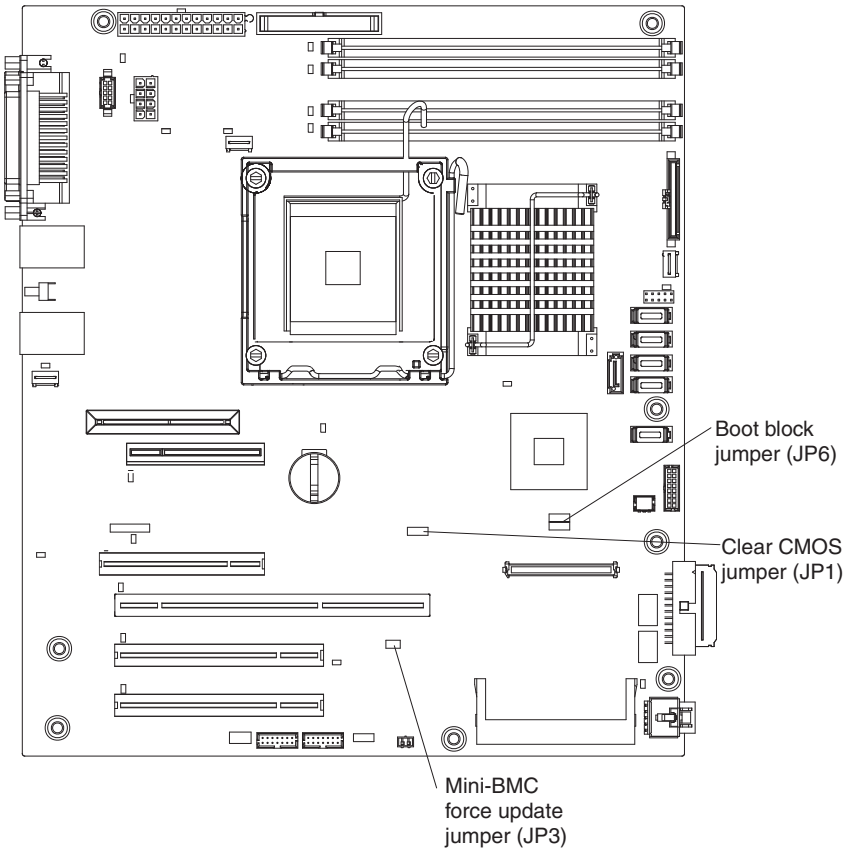
System-board LEDs

The following illustration shows the LEDs on the system board.



System-board jumpers

The following illustration shows the jumpers on the system board.



The following table describes the function of each jumper block.

Table 2. System-board jumper blocks

Jumper number	Jumper name	Jumper setting
JP1	Clear CMOS jumper	• Pins 1 and 2: Keep CMOS data (default) • Pins 2 and 3: Clear the CMOS data, which clears the power-on password. Make sure that the ac power source is disconnected from the server. **Note:** Changing the position of this jumper does not affect the administrator password check if an administrator password is set. If the administrator password is set and forgotten, remove and then reinstall the battery.
JP3	Mini-BMC force update	Pins 1 and 2: Open (default). **Note:** You do not need to set this jumper because it stays at this setting.
JP6	Boot block jumper (JP6)	• Pins 1 and 2: Normal (default) • Pins 2 and 3: Recover boot block (see “Updating (flash-update) the BIOS code on the server” on page 109)

Chapter 2. Configuration information and instructions

The firmware for the server is periodically updated and is available for download from the Web. This chapter provides information about updating the firmware and using the configuration utilities.

Updating the firmware

The firmware for the server is periodically updated and is available for download on the Web. Go tohttp://www.ibm.com/systems/support/ to check for the latest level of firmware, such as BIOS code, vital product data (VPD) code, device drivers, and service processor firmware. Download the latest firmware for the server; then, install the firmware, using the instructions that are included with the downloaded files.

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.

To download firmware for the Lotus Foundations Appliance from the Web go tohttp://www.ibm.com/systems/support/, click the *System X* link, and choose *Lotus Foundations Appliance* from the *Product family* drop down box. The following firmware items are available:

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

Major components contain VPD code. You can select to update the VPD code when you update the BIOS code.

Using the Configuration/Setup Utility program

This section provides instructions for starting the Configuration/Setup Utility program and descriptions of the menu choices that are available.

Starting the Configuration/Setup Utility program

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

1. Turn on the server. If the server is already on when you start this procedure, you must shut down the operating system, turn off the server, wait a few seconds until all in-use LEDs are turned off, and restart the server.
2. When the message `Press F1 for Configuration/Setup, Press F12 for Boot Menu` is displayed, press F1. (This prompt is displayed on the screen for only a few seconds. You must press F1 quickly.) If you have set both a power-on password and an administrator password, you must type the administrator password to access the full Configuration/Setup Utility menu. If you do not type the administrator password, a limited Configuration/Setup Utility menu is available.
3. Follow the instructions on the screen.

Configuration/Setup Utility menu choices

The following choices are on the Configuration/Setup Utility main menu. Depending on the version of the BIOS code, some menu choices might differ slightly from these descriptions.

Note: When you use the server for the first time, you might want to use the Configuration/Setup Utility menu choice **Load Default Settings** to reset the Configuration/Setup Utility menu choices to the factory default settings, in case they were changed before you received the server. Otherwise, some choices might not be displayed in the menu.

- **System Summary**

  Select this choice to view configuration information, including the amount of installed memory. When you make configuration changes through other choices in the Configuration/Setup Utility program, the changes are reflected in the system summary; you cannot change settings directly in the system summary.

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

  – **Processor Summary**

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

- **System Information**

  Select this choice to view information about the server. When you make changes through other choices in the Configuration/Setup Utility program, some of those changes are reflected in the system information; you cannot change settings directly in the system information.

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

- **Devices and I/O Ports**

  Select this choice to view or change device assignments and input/output (I/O) ports. Select this choice to enable or disable the integrated SAS/SATA controller and Ethernet controller, and standard connectors (such as serial and parallel). **Enable** is the default setting for all controllers. If you disable a device, it cannot be configured, and the operating system will not be able to detect it (this is equivalent to disconnecting the device). If you disable the integrated SAS/SATA controller and no SAS/SATA adapter is installed, the server will have no SAS/SATA capability. If you disable the integrated Ethernet controller and no Ethernet adapter is installed, the server will have no Ethernet capability.

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

  – **Serial Port 1**

    Select this choice to set up serial port 1.

  – **Serial Port 2**

    Select this choice to set up serial port 2.

  – **Parallel Port Setup**

    Select this choice to set up the parallel port and to adjust the parallel port resources and features.

  – **Remote Console Redirection**

    Select this choice to enable and configure serial remote video and keyboard redirection.

  – **SATA Programming Interface**

    Select this choice to disable, enable, or configure the Serial ATA.

To comply with the 4690 OS requirement, this option provides a **Legacy Only (4690)** mode that you can select from the menu. When you select the **Legacy Only (4690)** mode, this enables the SATA 0 through SATA 3 ports for the 4690 OS.

  - **Planar Ethernet**

    Select this choice to disable or enable the Ethernet on the system board.

  - **USB Support**

    Select this choice to enable or disable the USB support.

  - **Video**

    Select this choice to view the video information.

  - **System MAC Addresses**

    Select this choice to view the MAC addresses for network devices that are installed in the server.

- **Date and Time**

  Select this choice to set the date and time in the server, in 24-hour format (*hour*:*minute*:*second*).

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

- **System Security**

  Select this choice to set passwords. See “Using passwords” on page 17 for more information about passwords.

  - **Administrator Password**

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

    Select this choice to set or change an administrator password. An administrator password is intended to be used by a system administrator; it limits access to the full Configuration/Setup Utility menu. If an administrator password is set, the full Configuration/Setup Utility menu is available only if you type the administrator password at the password prompt.

  - **Power-on Password**

    Select this choice to set, change, or delete a power-on password.

- **Start Options**

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

  You can set keyboard operating characteristics, such as the keyboard speed, and you can specify whether the server starts with the keyboard number lock on or off.

  You can enable or disable the hard disk drive self-monitoring, analysis, and reporting technology (SMART) function.

  You can enable a virus-detecting test that checks for changes in the boot record when the server starts.

  - **Startup Sequence Options**

    Select this choice to view the **Startup Sequence Options** menu. The startup sequence specifies the order in which the server checks devices to find a boot record. The server starts from the first boot record that it finds.

- **Advanced Setup**

  Select this choice to change values for advanced hardware features, such as CPU options and PCI configuration.

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

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

– **CPU Options**

  Select this choice to view or change the options that control the behavior of the CPU.

– **PCI Bus Control**

  Select this choice to view or change the system resources that are used by the installed PCI or PCI-Express devices.

– **RSA II Settings**

  This choice is displayed only when a Remote Supervisor Adapter II SlimLine is installed in the server.

  Select this choice to view the DHCP IP address and settings and the Remote Supervisor Adapter II SlimLine MAC address; to view or change the DHCP control, static IP address, operating-system USB selections; and to save the values and reboot the Remote Supervisor Adapter II SlimLine.

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

  Select this choice to change the Intelligent Platform Management Interface (IPMI) settings for the mini-BMC controller.

  - **IPMI Specification Version**

    This nonselectable item displays the IPMI specification version.

  - **BMC Firmware Version**

    This nonselectable item displays the mini-BMC firmware version.

  - **BMC Build Date**

    This nonselectable item displays the date that the mini-BMC code was built.

  - **BMC Build Level**

    This nonselectable item displays the version of the mini-BMC code.

  - **Existing Event Log number**

    This nonselectable item displays the number of entries in the system-event log.

  - **BMC POST Watchdog**

    This option enables or disables the POST watchdog. **Disabled** is the default setting.

  - **BMC POST Watchdog Timeout**

    This option enables or disables the mini-BMC POST watchdog timer.

  - **System - BMC Serial Port Sharing**

    Select this choice to specify whether the serial port that the mini-BMC uses is shared with the other system components or is dedicated to the mini-BMC. When this option is enabled, the mini-BMC controls the serial port by way of remote commands. If this option is disabled, the serial port is assigned to the mini-BMC, unless the **BMC Serial Port Access Mode** option is set to disabled.

  - **BMC Serial Port Access Mode**

    Select this choice to set the mini-BMC access mode for the system serial port. **Shared** is the default setting. You can choose from the following access modes:

    Shared

    The serial port is available for use by POST and the operating system, however, the mni-BMC can still monitor the serial data for a take-control sequence.

Pre-Boot
The mini-BMC has control of the serial port before the operating system is booted, however, after the operating system is booted, the mini-BMC will not have access to the serial port until you turn off the server or reset the settings.

Dedicated
The mini-BMC has complete control of the serial port. POST and the operating system will not be allowed to use the serial port.

Disabled
The mini-BMC has access to the serial port.

- **Reboot System on NMI**

  This option sets the mini-BMC timer to automatically reboot the server after an NMI occurs. **Enabled** is the default setting.

- **User Account Settings**

  Select this choice to view the user account settings for the mini-BMC.

- **BMC Network Configuration**

  Select this choice to configure specific network settings for the mini-BMC.

- **BMC System Event Log**

  Select this choice to view the mini-BMC system-event log, which contains all system-error messages that have been generated. Use the arrow keys to move among pages in the log. Run the diagnostic programs to get more information about the error codes. Select Clear BMC System Event Log to clear the mini-BMC system-event logs.

- **Event/Error Logs**

  Select this choice to view or clear error logs.

  – **System Event/Error Log**

    Select this choice to view the system-event and error messages that the system generated during POST and run time. by the SMI handler and by the service processor. The most recent event or error is displayed first. Use the Down Arrow key to view the older entries, and use the Up Arrow key to view the newer entries. Select **Clear system logs** and press Enter to erase the system event/error log.

- **Save Settings**

  Select this choice to save the changes that you have made in the settings.

- **Restore Settings**

  Select this choice to cancel the changes that you have made in the settings and restore the previous settings.

- **Load Default Settings**

  Select this choice to cancel the changes that you have made in the settings and restore the factory settings.

- **Exit Setup**

  Select this choice to exit from the Configuration/Setup Utility program. If you have not saved the changes that you have made in the settings, you are asked whether you want to save the changes or exit without saving them.

Using passwords

You can use any combination of up to seven characters (A - Z, a - z, and 0 - 9) for the power-on (user) password or the administrator password.

If you set a power-on password and an administrator password, you can type either password at the password prompt that is diaplayed as you start the computer. However, if you want to change the settings in the Configuration/Setup Utility program, you must type the administrator password to access the full Configuration/Setup Utility menu. If you type the power-on password, you have access to only the limited Configuration/Setup Utility menu.

Keep a record of the password in a secure place. If you forget the power-on password or administrator password, you can regain access to the computer through one of the following methods:

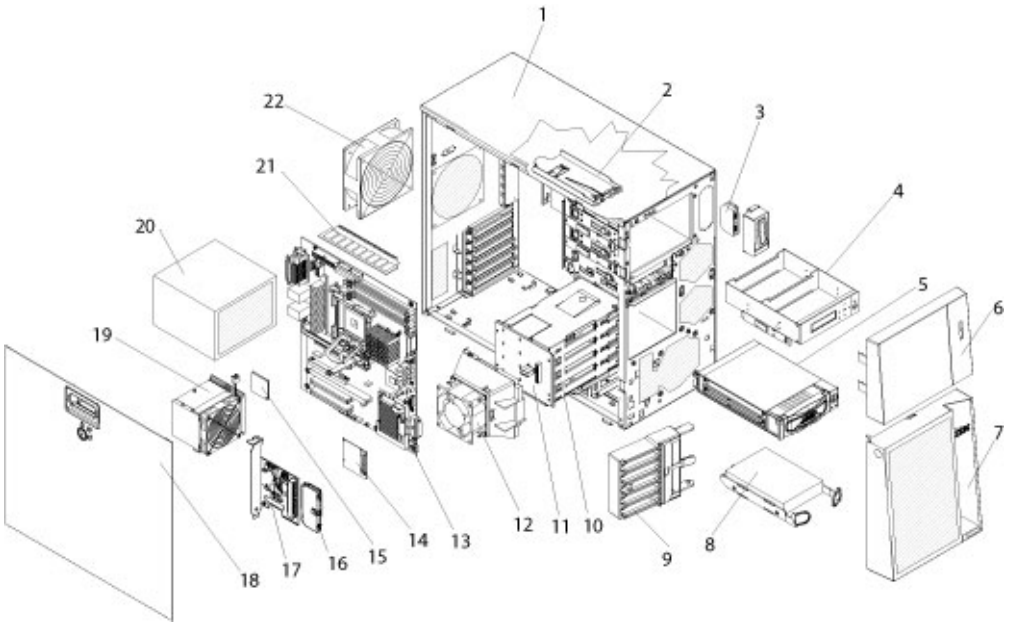
- If you have forgotten the power-on password and an administrator password is set, type the administrator password at the power-on prompt. Start the Configuration/Setup Utility program and change the power-on password.
- Remove the battery and then install the battery.

Chapter 3. Parts listing, Lotus Foundations Appliance Type 9234

The following replaceable components are available for all models of the Lotus Foundations Appliance, except as specified otherwise in Table 3 on page 20. For an updated parts listing on the Web, complete the following steps.

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

1. Go to http://www-01.ibm.com/software/lotus/support/
2. Under Search Lotus support, enter the search term ″Foundations Hardware″.
3. In the search results, select the document ″Certified and Supported Hardware Types for Lotus Foundations″.
4. Verify the hardware type in-use. Search via the indicated Foundations Knowledge Base link(s) for more detailed information.



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 included with the Lotus Foundations Appliance.

Table 3. Parts listing, Types 9234 CNU & DNU

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
1	Chassis assembly			44X0386
2	Front-panel assembly		44E7571	
3	Front USB connector assembly		26K7340	
4	LCD control panel and display	46C6561		
5	Hotswappable idb drive kit	46M6560		
6	Bezel, upper	46M6507		
7	Bezel, lower	46M6557		
8	Hard disk drive, SATA, 3.- inch 250 GB, fixed/simple-swap, with tray (optional)	39M4511		
8	Hard disk drive, SATA, 3.5-inch 500 GB, fixed/simple-swap, with tray (optional)	39M4517		
9	Retention bracket (front), adapter		13N2993	
10	Hard disk drive cage, 2.5-inch drives (four bays)	42C8910		
11	Hard disk drive backplane (for 2.5-inch and 3.5 in Hot-Swap SAS/SATA hard disk drives)		44E8783	
11	Hard disk drive backplate (for 3.5-inch Simple-Swap SATA hard disk drives)		25R8842	
12	Hard disk drive fan assembly (for 2.5-inch drive cage with 4 bays)		39Y9860	
13	System board assembly			44E7312
14	SAS/SATA RAID 01 controller		43W4297	
15	Microprocessor, 1066 MHz/3M, 2.53 GHz dual-core (model: Intel E7200)			46M0338
15	Microprocessor, 1333 MHz/6M, 2.66 GHz quad-core (model: Intel X3330)			46M0340
16	IDE PATA Flash Module (DOM)	46M6587		
17	SATA interposer card		46D1649	
18	Side cover with lock	25R8859		

Table 3. Parts listing, Types 9234 CNU & DNU (continued)

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
19	Fan sink			43W0401
20	Power supply, non-redundant 401 watt			39Y7330
21	Memory, 1 GB DDR2/667 MHz PC2-5300 ECC	41Y2728		
21	Memory, 2 GB DDR2/667 MHz PC2-5300 ECC (optional)	46C7427		
22	System fan, rear		25R8829	
	PRO/1000 PT Dual Port Server adapter	39Y6070		
	Battery, 3.0 volt		33F8354	
	Cable, 18-inch SATA signal		39Y9810	
	Cable, 401 watt DAS (for non-redundant power supply and hot-swap drives connection)		25R8849	
	Cable, mini-SAS/SATA 4X signal (models: 34x, 42x, 52x, 54x, 72x, 74x)		41Y3884	
	EMC I/O shield (for system I/O ports)	25R8843		
	EMC shield kit (for 5.25 in. and 3.5 in. drive bays)	13N2997		
	Feet, chassis	13N2985		
	Keylock, keyed-alike		26K7364	
	Keylock, keyed-random		26K7364	
	Microprocessor backplate assembly (mounting bracket)			25R8843
	Retention module (for fan sink)			25R8873
	System service label	44E7281		
	Tray assembly, simple-swap			25R8864

Power cords

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

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

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

For units intended to be operated at 230 volts (U.S.): Use 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

IBM power cord part number	Used in these countries and regions
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, 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
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

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, Lotus Foundations Appliance Type 9234,” on page 19 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 included with the Lotus Foundations Appliance.

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 28. This information will help you work safely.
- When you install your new server, take the opportunity to download and apply the most recent firmware updates. This step will help to ensure that any known issues are addressed and that your server is ready to function at maximum levels of performance. To download firmware updates for your server, complete the following steps.

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

  1. Go to http://www-01.ibm.com/software/lotus/support/
  2. Under Search Lotus support, enter the search term ″Foundations Hardware″.
  3. In the search results, select the document ″Certified and Supported Hardware Types for Lotus Foundations″.
  4. Verify the hardware type in-use. Search via the indicated Foundations Knowledge Base link(s) for more detailed information.
- Before you install optional hardware devices, make sure that the server is working correctly. Start the server, and make sure that the operating system starts, if an operating system is installed, or that a 19990305 error code is displayed, indicating that an operating system was not found but the server is otherwise working correctly. If the server is not working correctly, see the Diagnostics section for more information.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- If you must start the server while the cover is removed, make sure that no one is near the server and that no other objects have been left inside the server.
- Do not attempt to lift an object that you think is too heavy for you. If you have to lift a heavy object, observe the following precautions:

  - Make sure that you stand safely without slipping.
  - Distribute the weight of the object equally between your feet.
  - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
  - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles
- Make sure that you have an adequate number of properly grounded electrical outlets for the server, monitor, and other devices.
- Back up all important data before you make changes to disk drives.
- Have a small flat-blade screwdriver available.
- You do not have to turn off the server to install or replace hot-swap power supplies, hot-plug adapters, or hot-plug Universal Serial Bus (USB) devices. However, you must turn off the server before performing any steps that involve removing or installing adapter or system-board cables.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the server, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- When you are finished working on the server, reinstall all safety shields, guards, labels, and ground wires.
- For a list of supported optional devices for the server, see http://www.ibm.com/servers/eserver/serverproven/compat/us/.

System reliability guidelines

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

- If the server has redundant power, each of the power-supply bays has a power supply installed in it.
- There is adequate space around the server to allow the server cooling system to work properly. Leave approximately 50 mm (2 in.) of open space around the front and rear of the server. Do not place objects in front of the fans. For proper cooling and airflow, replace the server cover before you turn on the server. Operating the server for extended periods of time (more than 30 minutes) with the server cover removed might damage server components.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan within 48 hours.
- You have replaced a hot-swap drive within 10 minutes of removal.
- You do not run the server without the air baffle installed. Operating the server without the air baffle might cause the microprocessor to overheat.
- The microprocessor socket always contains a microprocessor and fan sink.

Working inside the server with the power on

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

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

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

Handling static-sensitive devices

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

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

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

Returning a device or component

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

Connecting the cables

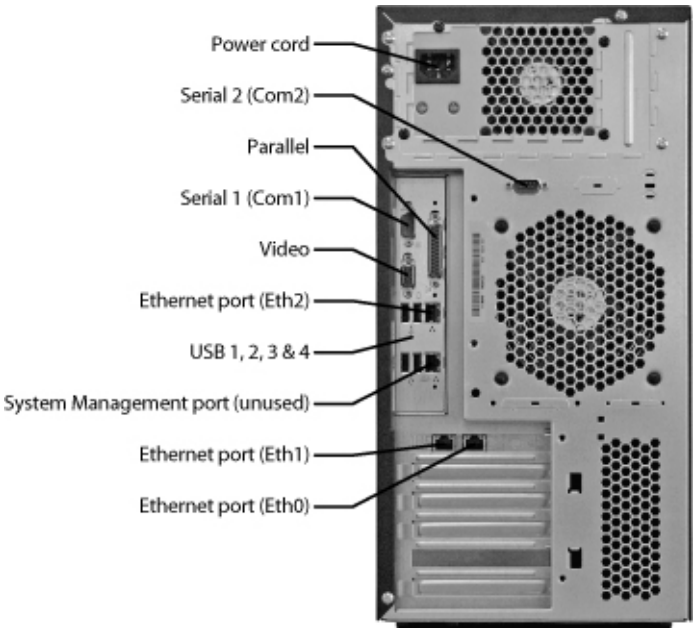
You must turn off the server before you connect any cables to or disconnect any cables from the server.

Note: If the cable that you are connecting or disconnecting is a USB cable, however, you do not have to turn off the server.

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

For details about the locations and functions of the input/output connectors, see “Server controls, LEDs, and power” on page 4.

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



Removing and replacing Tier 1 CRUs

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

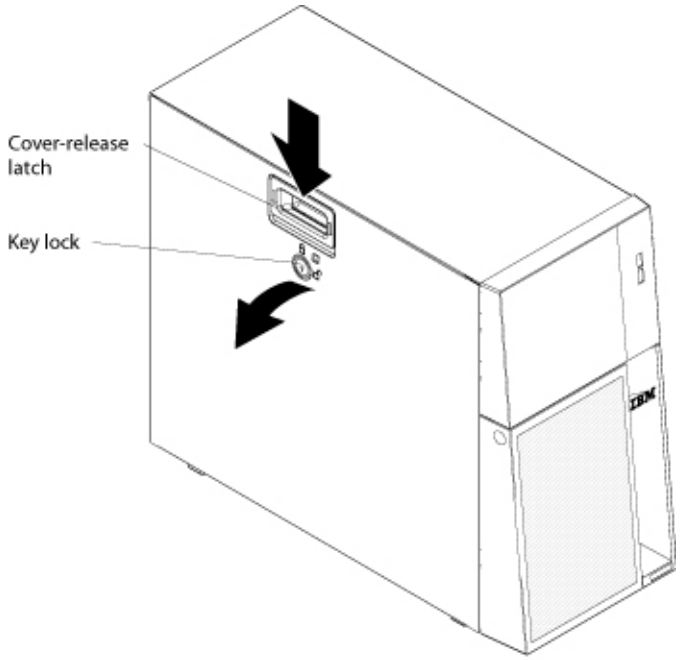
The illustrations in this document might differ slightly from your hardware.

Removing the side cover

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

To remove the side cover, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. If you are replacing a non-hot-swap component, turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock the side cover.
4. Press the cover-release latch down, as indicated by the two arrows on the latch, and tilt the top of the side cover away from the chassis.



5. Lift the side cover off the server and set it aside.
6. If you are instructed to return the side cover, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

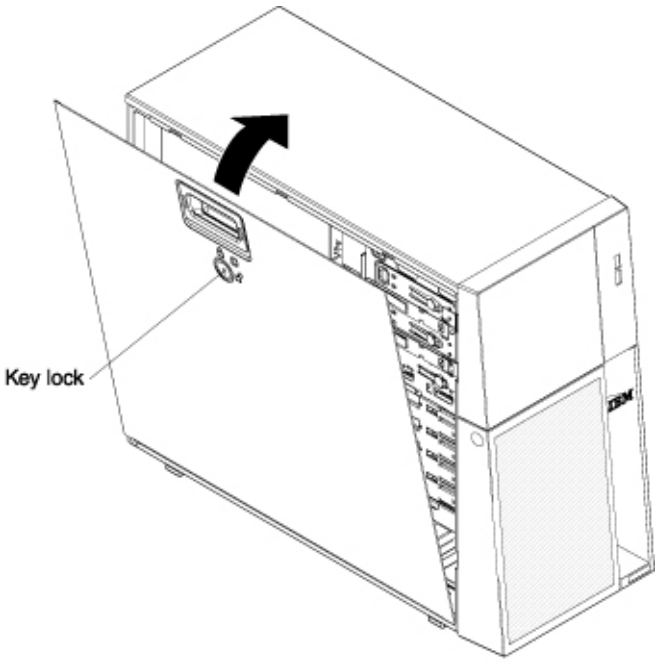
Installing the side cover

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

To install the side cover, complete the following steps:

1. Make sure that all cables, adapters, and other components are installed and seated correctly and that you have not left loose tools or parts inside the server. Also, make sure that all internal cables are correctly routed.
2. If you removed the upper and lower bezels, reinstall them before you replace the side cover (see “Installing the upper bezel” on page 33 and “Installing the lower bezel” on page 35).

   Important: The cover lock must be in the unlocked (opened) position before you install the side cover.
3. Position the lip on the bottom edge of the side cover on the ledge on the bottom of the chassis; then, rotate the cover up to the chassis. Press down on the cover release latch and push the cover completely closed until it latches securely into place.



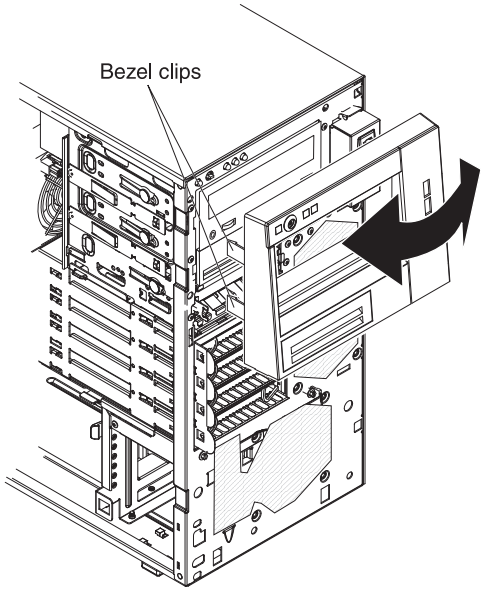
4. Lock the side cover.
5. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the upper bezel

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

To remove the upper bezel, complete the following steps:

1. Read the safety information found in this guide as well as “Installation guidelines” on page 25.
2. If you are replacing a non-hot-swap component, turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 30).
4. Remove the lower bezel (see “Removing the lower bezel” on page 34).
5. Carefully lift up the two bezel clips on the left side of the upper bezel; then, rotate the upper bezel to the right side of the server to disengage the two right-side tabs from the chassis.

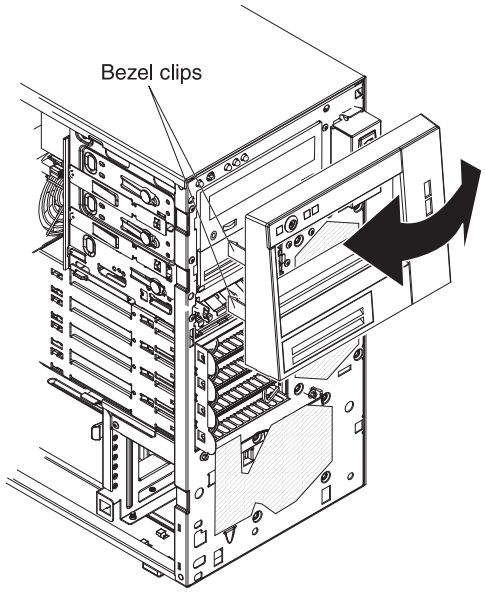


6. If you are instructed to return the upper bezel, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the upper bezel

To install the upper bezel, complete the following steps:

1. Insert the two tabs on the right-side of the upper bezel into the corresponding holes on the right side of the chassis.



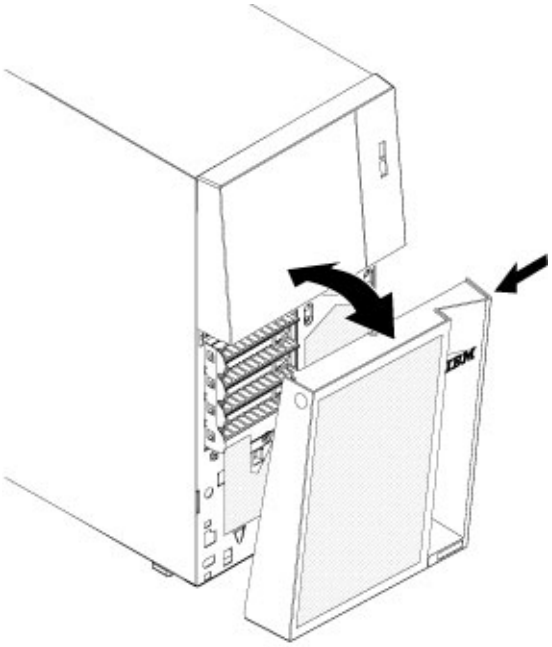
2. Rotate the upper bezel to the left side of the chassis until the bezel clips are aligned with the corresponding indentations on the left side of the chassis and it snaps into place.
3. Install the lower bezel (see “Installing the lower bezel” on page 35).
4. Install the side cover (see “Installing the side cover” on page 31).
5. Lock the side cover.
6. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the lower bezel

To remove the lower bezel, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. If you are replacing a non-hot-swap component, turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock the side cover.

   Note: You do not have to remove the side cover to remove the lower bezel.
4. Press the round blue release button on the right side of the lower bezel and rotate the lower bezel downward to disengage and remove it from the chassis.

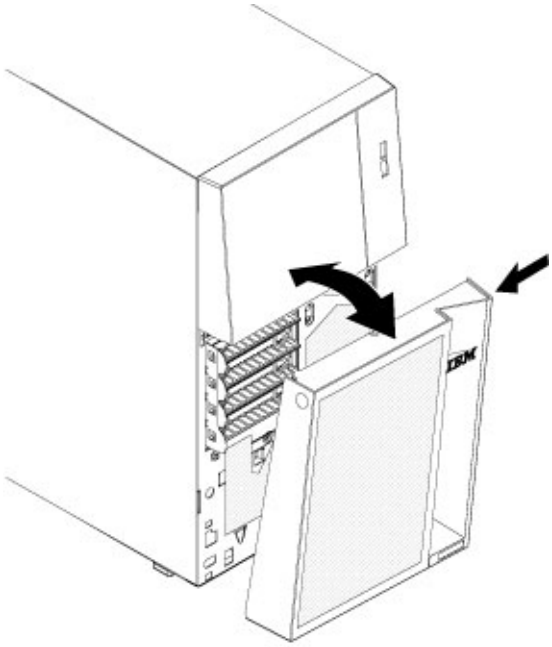


5. If you are instructed to return the lower bezel, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the lower bezel

To install the lower bezel, complete the following steps:

1. Insert the two bottom tabs on the lower bezel into the corresponding holes in the front of the chassis.



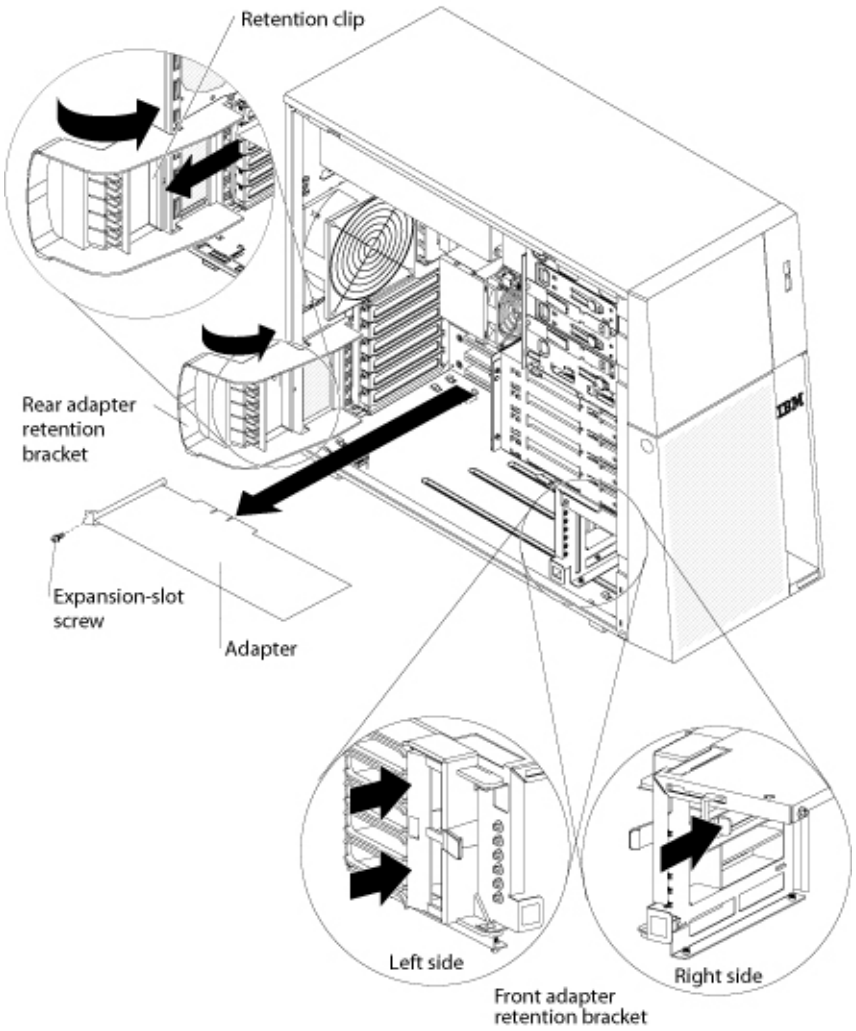
2. Rotate the top of the lower bezel up to the chassis; then, press the blue release tab on the right side of the lower bezel and completely close the lower bezel until it locks securely into place.
3. Lock the side cover.
4. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing an adapter

To remove an adapter, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 30).
4. Disconnect any cables to the adapter or any cables that impede access to the adapter.
5. If you are removing a full-length adapter, press on the retaining tab on the left side of the front adapter-retention bracket until the release lever on the right side of the bracket clicks into place.
6. Remove the expansion-slot screw at the rear of the adapter.
7. Carefully grasp the adapter by its top edge or upper corners, and pull the adapter from the server.

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



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

Installing an adapter

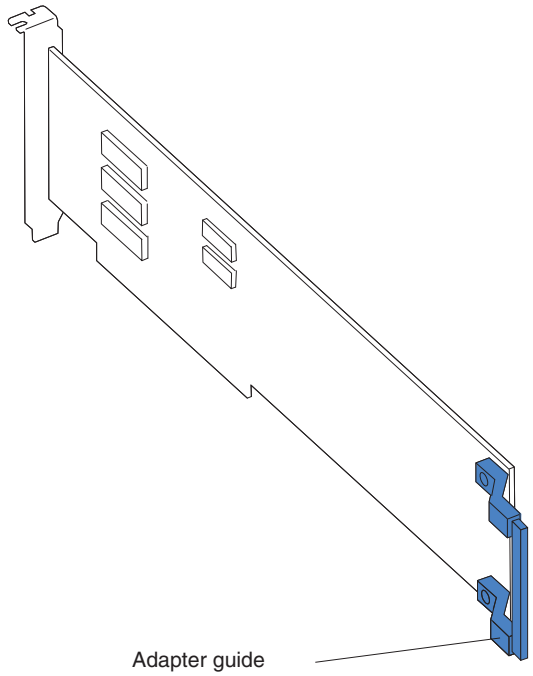
For information about the types of adapters that the server supports and other information that you might consider when you install an adapter, consult the Lotus Foundations knowledge base or speak directly with IBM technical support. For the locations of the expansion slots and optional-device connectors see “System-board optional-devices connectors” on page 10.

Notes:

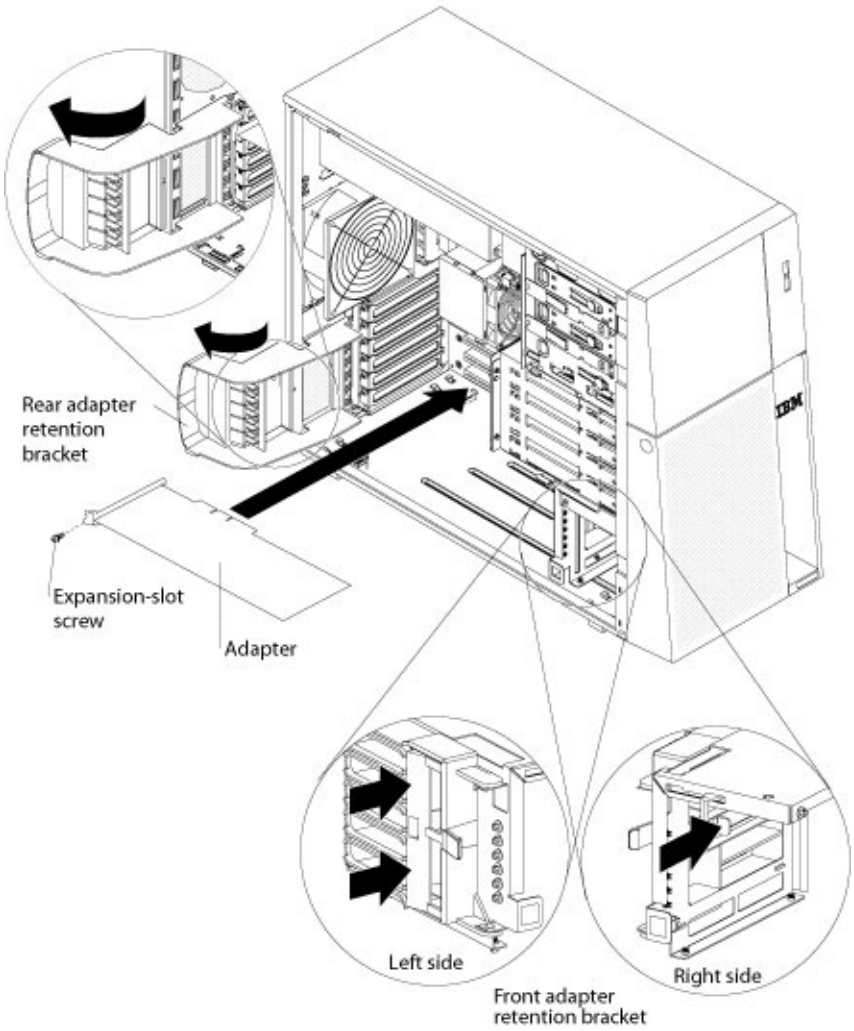
1. If you are replacing a Remote Supervisor Adapter II SlimLine, it must be installed in its dedicated connector on the system board (see “System-board optional-devices connectors” on page 10).
2. When you start the server for the first time after you install a Remote Supervisor Adapter II SlimLine, the startup process will take several minutes longer than a typical startup.

To install a replacement adapter, complete the following steps:

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



5. Carefully grasp the adapter by the top edge or upper corner, and move the adapter directly from the static-protective package to the expansion slot. Align the adapter with the expansion slot guides; then, press the adapter firmly into the expansion slot. For a full-length adapter, make sure that the front edge of the adapter is correctly seated in the correct slot in the front adapter-retention bracket.



6. Install an expansion-slot screw at the rear of the adapter.
7. If you are installing a full-length adapter, press on the release lever on the right side of the front adapter-retention bracket to release the retaining tab on the left side of the bracket.
8. Connect required cables to the adapter. Route cables so that they do not block the flow of air from the fans.
9. Install and lock the side cover (see “Installing the side cover” on page 31).
10. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

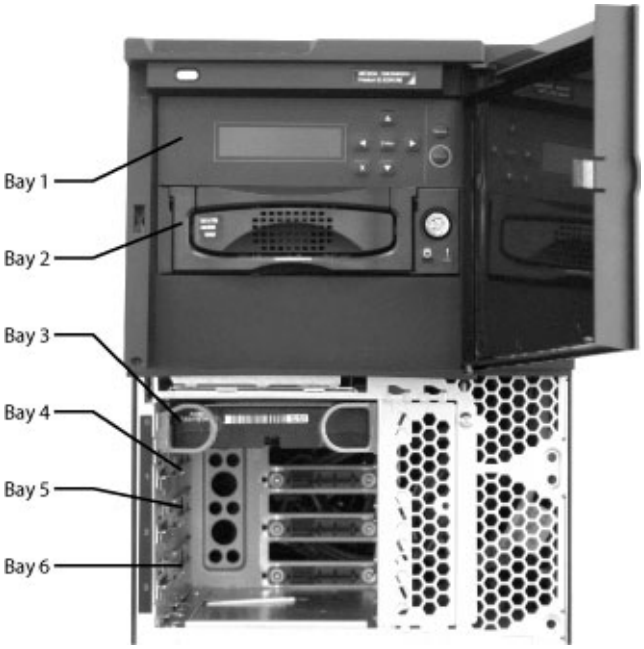
Removing and installing internal drives

Before you install a simple-swap SATA hard disk drive, read the following information:

- You can install four simple-swap SATA hard disk drives in the server.
- Install the drives in ascending order by bay number.

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

The following figures show the locations of the drive bays in the server.



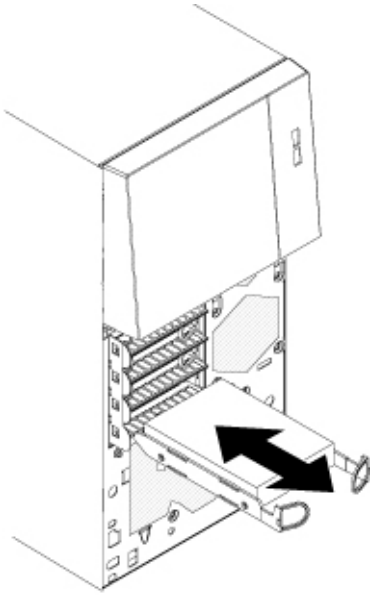
Removing a simple-swap hard disk drive

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

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

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

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock the side cover. The side cover does not have to be removed.
4. Remove the lower bezel (see “Removing the lower bezel” on page 34).
5. Pull the loops of the drive assembly that is to be removed toward each other; then, pull the assembly out of the bay.



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

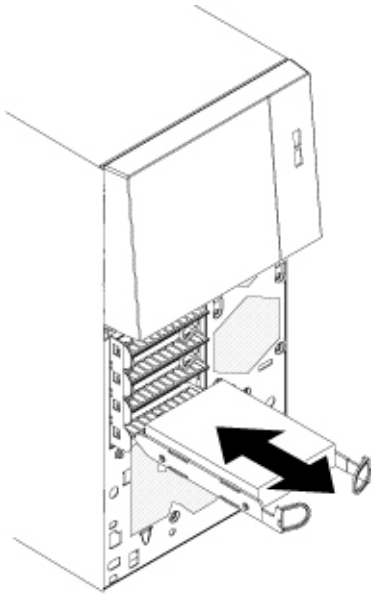
Installing a simple-swap hard disk drive

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

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

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

1. Touch the static-protective package that contains the drive to any unpainted metal surface on the server; then, remove the drive from the package and place it on a static-protective surface.
2. Align the drive assembly with the guide rails in the bay.



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

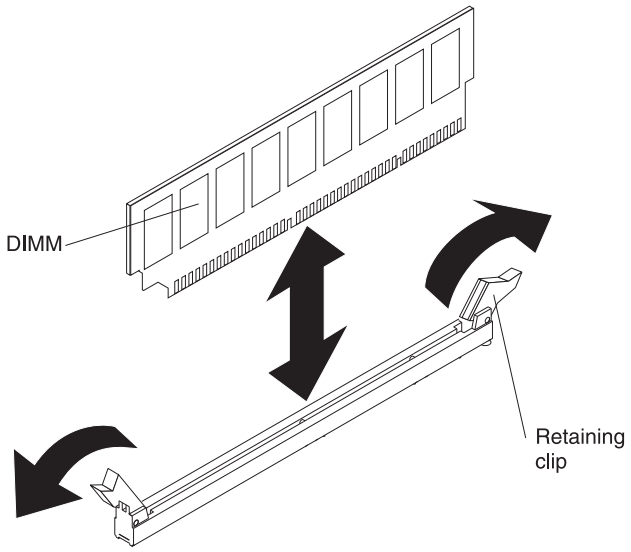
   Note: Do not release the loops on the drive assembly until it is completely seated.
4. Install the lower bezel (see “Installing the lower bezel” on page 35).
5. Lock the side cover.
6. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

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 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 30).
4. Disconnect any cables that impede access to the DIMMs.
5. Locate the DIMM connector that contains the DIMM that is to be replaced (see “System-board optional-devices connectors” on page 10 for DIMM slot locations).

   Attention: To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.
6. Carefully open the retaining clips on each end of the DIMM connector and remove the DIMM.



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

Installing a memory module

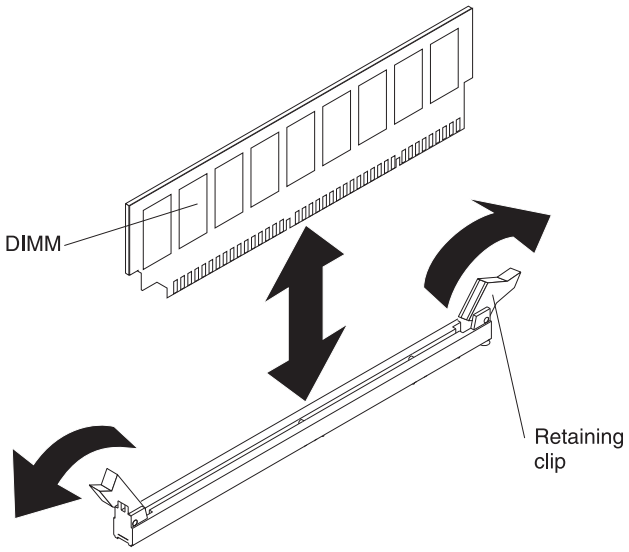
Note: If you are replacing a faulty DIMM, make sure that the replacement DIMM is the correct type of memory. If you are adding DIMMs, install the DIMMs in the sequence shown in the following table.

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

To install a DIMM, complete the following steps:

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

   Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, open and close the clips gently.
4. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is firmly seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly installed. Open the retaining clips, remove the DIMM, and then reinsert it.

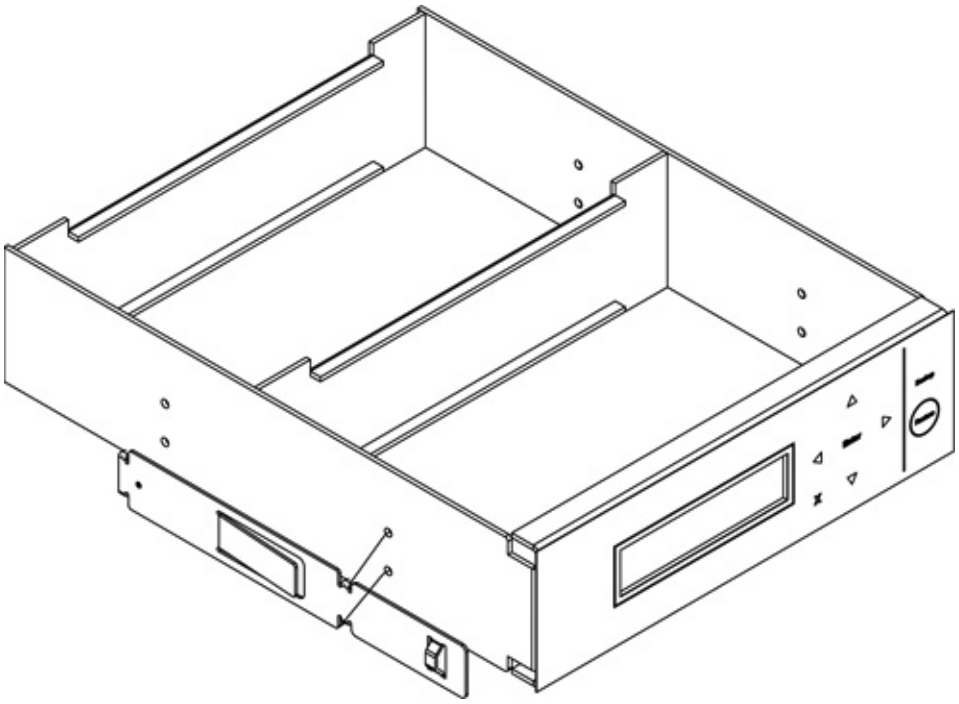


5. Reconnect any cables that you disconnected during removal.
6. Install the side cover (see “Installing the side cover” on page 31).
7. Lock the side cover if you unlocked it during removal.
8. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Replacing an LCD display and control panel

To replace the LCD display, complete the following steps:

1. With the server powered off and the power cable removed, detach the server side cover.
2. Detach the front upper bezel of the server.
3. Detach the cables connected to the LCD display. Make sure you note the cables that were disconnected as the replacement unit will need to be reconnected in the exact same way.
4. Detach the LCD display from the front of the server and slide the unit out of the bay.
5. Insert the replacement unit into the same bay, ensuring that it is properly secured to the server cage.
6. Reconnect the same wires that were connected to the previous LCD display.
7. Reconnect the upper bezel and attach the side cover of the server.



Removing and replacing Tier 2 CRUs

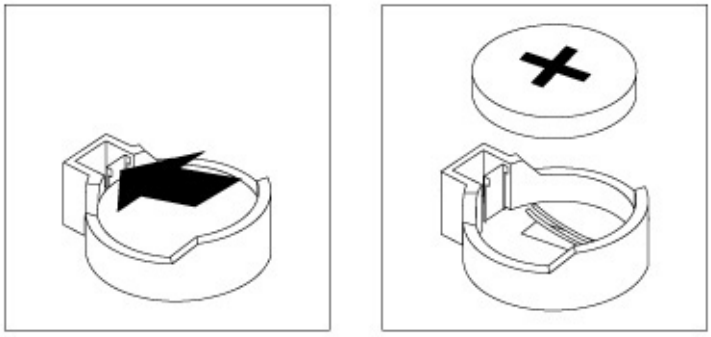
You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for the server.

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

Removing the battery

To remove the battery, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 30).
4. Remove any adapters that impede access to the battery.
5. Locate the battery on the system board (see “System-board internal connectors” on page 8).
6. Remove the battery:
   a. Use a fingernail to press the top of the battery clip away from the battery. The battery pops up when it is released.



   b. Use your thumb and index finger to lift the battery from the socket.

Installing the battery

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

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

Statement 2:

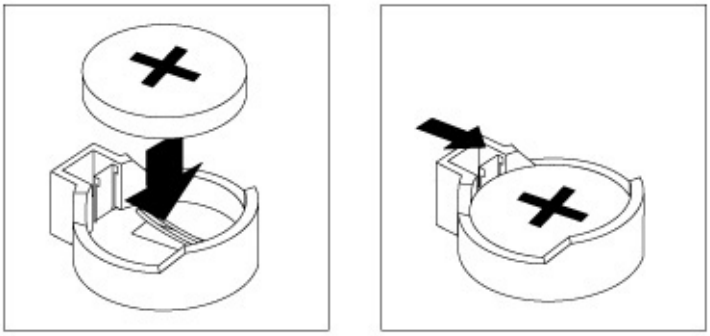
CAUTION:
When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium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

Do not:

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

To install the battery, complete the following steps:

1. Follow any special handling and installation instructions that come with the replacement battery.
2. Insert the new battery:
   a. Tilt the battery so that you can insert it into the socket on the side opposite the battery clip.



   b. Press the battery down into the socket until it clicks into place. Make sure that the battery clip holds the battery securely.
3. Install the side cover (see “Installing the side cover” on page 31).
4. Lock the side cover if you unlocked it during removal.
5. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.
6. Start the Configuration/Setup Utility program and reset the configuration:
   - Set the system date and time.
   - Set the power-on password.
   - Reconfigure the server.

   See “Using the Configuration/Setup Utility program” on page 13 for details.

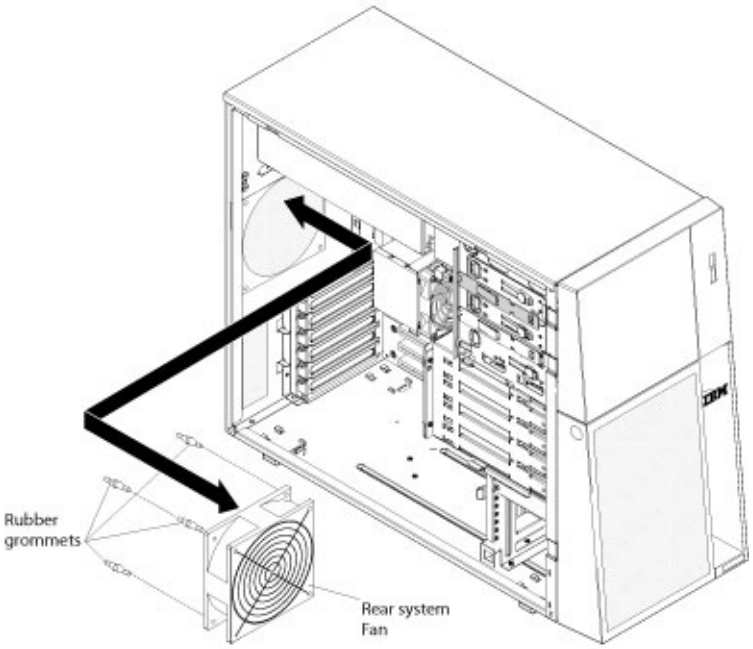
Removing the rear system fan

Attention:

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

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

1. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
2. Unlock and remove the side cover (see “Removing the side cover” on page 30).
3. Remove any adapters that impede access to the fan and the fan connector on the system board (see “Removing an adapter” on page 36).
4. Disconnect the fan cable from the system board, making a note of where the cable was connected, for later installation.
5. Grasp the fan with both hands and pull firmly, extending the rubber grommets. The grommets will be pulled through the holes in either the fan or the chassis and can then be removed.



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

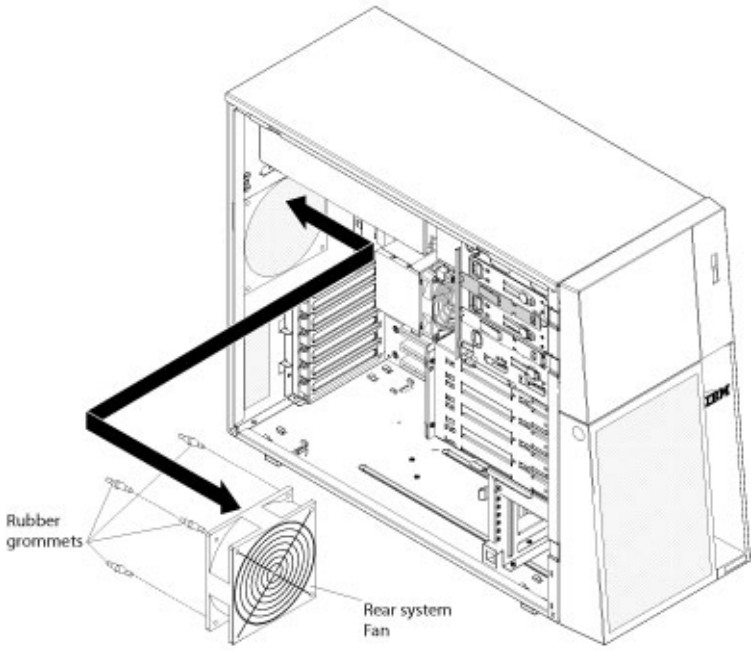
Installing the rear system fan

Attention:

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

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

1. The replacement fan comes with the rubber grommets installed; however, they might have come out during shipment. If any of the rubber grommets are missing from the fan, install them on the fan before you continue. Use needle-nosed pliers to pull the grommets through the holes in the 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 rear fan connector).
4. Install any adapters that you removed (see “Installing an adapter” on page 37).
5. Install the side cover (see “Installing the side cover” on page 31).
6. Lock the side cover if you unlocked it during removal.
7. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the hard disk drive fan assembly

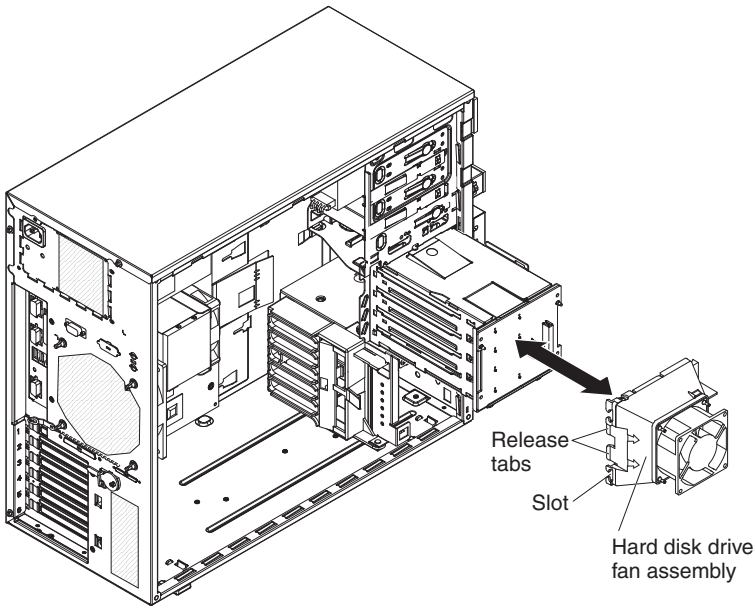
This procedure applies only to server models that have a hard disk drive fan assembly.

Attention:

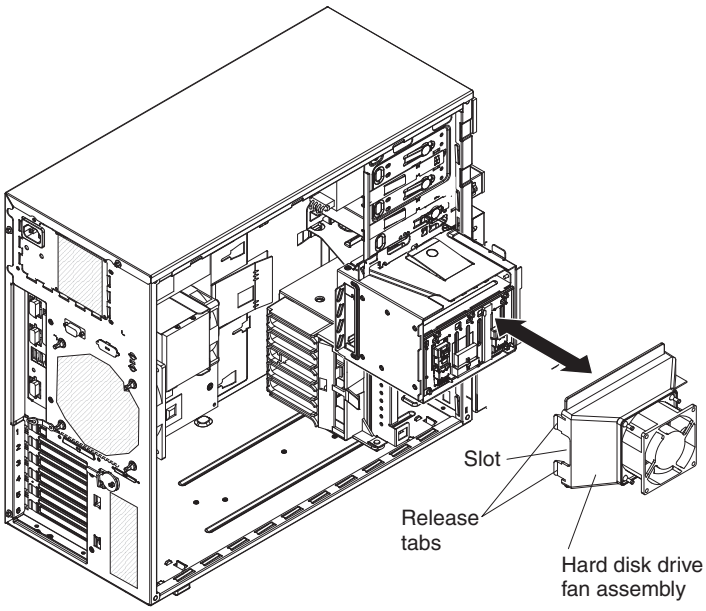
- Replace a failed fan within 48 hours.
- To ensure proper cooling and airflow, do not operate the server for more than 30 minutes with the side cover removed.

To remove the hard disk drive fan assembly, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 30).
4. Disconnect the hard disk drive fan assembly cable from the system board, making a note of where the cable was connected for later installation.
5. Remove the hard disk drives.
6. Press and hold the drive cage release tab; then, rotate the drive cage out of the chassis until the retaining tab on top of the cage locks into place.
7. Pull out on the hard disk drive fan assembly release tabs; then, rotate the assembly away from the drive cage slightly.



If you have the eight-drive, 2.5-inch hot-swap hard disk drive model, the hard disk drive fan assembly looks like the following illustration.



8. Remove the cable from the slot on the hard disk drive fan assembly; then, rotate the assembly away from the drive cage and remove the assembly from the drive cage.
9. If you are instructed to return the hard disk drive fan assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the hard disk drive fan assembly

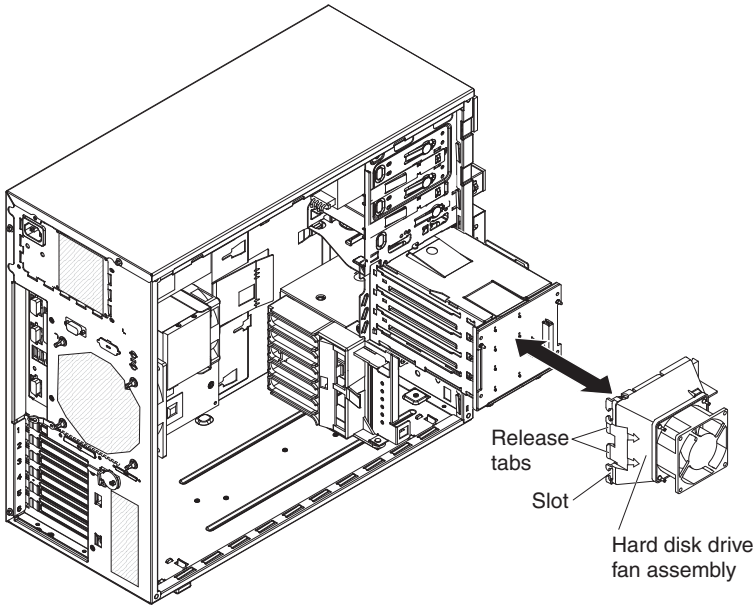
This procedure applies only to server models that have a hard disk drive fan assembly.

Attention:

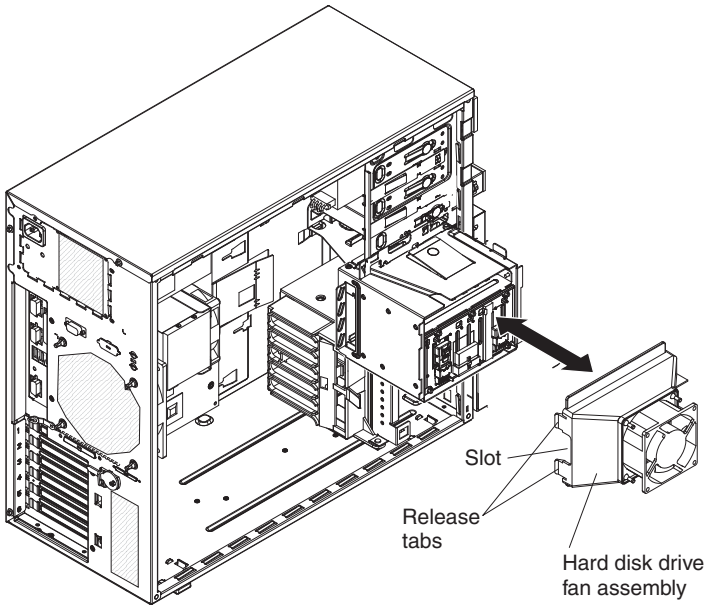
- Replace a failed fan within 48 hours.
- To ensure proper cooling and airflow, do not operate the server for more than 30 minutes with the side cover removed.

To install the hard disk drive fan assembly, complete the following steps:

1. Insert the hard disk drive fan assembly retaining tab over the right edge of the hard disk drive backplane; then, rotate the fan assembly toward the backplane. Do not fully close the hard disk drive fan assembly.



If you have the eight-drive, 2.5-inch hot-swap hard disk drive model, the hard disk drive fan assembly looks like the following illustration.



2. Route the hard disk drive signal and power cables through the slots on the edge of the hard disk drive fan assembly. Make sure that the cables will not be pinched between the hard disk drive assembly and the hard disk drive backplane when the assembly is installed.
3. Rotate the hard disk drive fan assembly toward the backplane until the release tabs are fully engaged on the drive cage.
4. Rotate the drive cage toward the front of the server until it stops; then, press and hold the retaining tab on top of the drive cage while you rotate the drive cage into the chassis until it locks into place.
5. Connect the hard disk drive fan assembly cable to the system board (see "System-board internal connectors" on page 8 for the location of the hard disk drive fan connector).
6. Reinstall the hard disk drives.

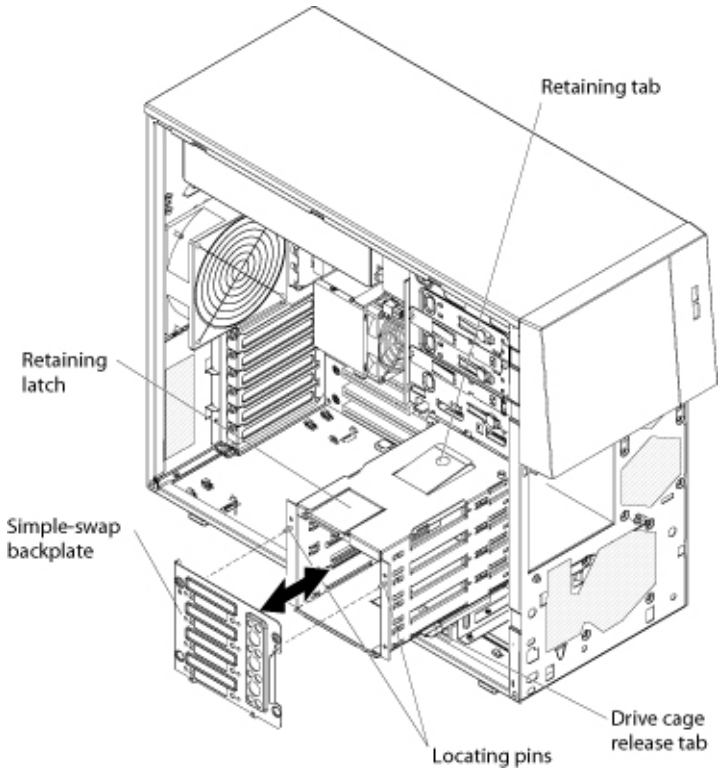
   Note: Before you continue, check all internal power cables to be sure that they are connected to the system board and other optional devices.
7. Install the side cover (see "Installing the side cover" on page 31).
8. Lock the side cover if you unlocked it during removal.
9. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the simple-swap backplate

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

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

1. Read the safety information that begins on page vii and "Installation guidelines" on page 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see "Removing the side cover" on page 30).
4. Remove the lower bezel (see "Removing the lower bezel" on page 34).
5. Remove the simple-swap hard disk drives that are installed in the hard disk drive cage (see "Removing a simple-swap hard disk drive" on page 40).
6. Remove the hard disk drive fan assembly from the hard disk drive cage (see "Removing the hard disk drive fan assembly" on page 49).
7. Disconnect the power cables from the simple-swap backplate.
8. Disconnect the signal cables from the system board.
9. Press and hold the drive cage release tab; then, rotate the drive cage out of the chassis until the retaining tab on top of the cage locks into place.
10. Lift up on the retaining latch at the top of the drive cage; then, tilt the top of the simple-swap backplate away from the drive cage until it is clear of the locating pins.



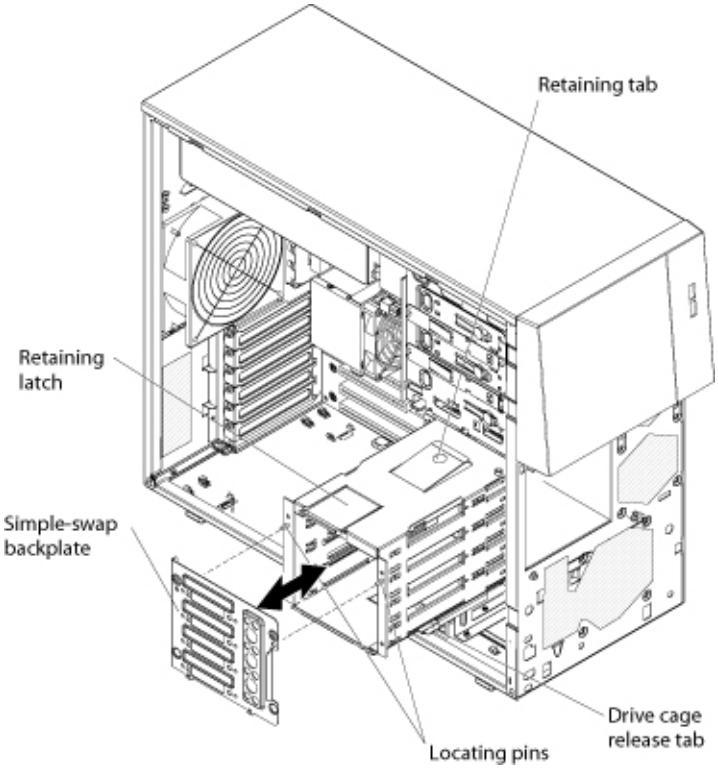
11. Lift the simple-swap backplate out of the lower lip on the drive cage and set it aside.
12. If you are instructed to return the simple-swap backplate, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the simple-swap backplate

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

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

1. Position the bottom edge of the simple-swap backplate on the lower lip of the drive cage.

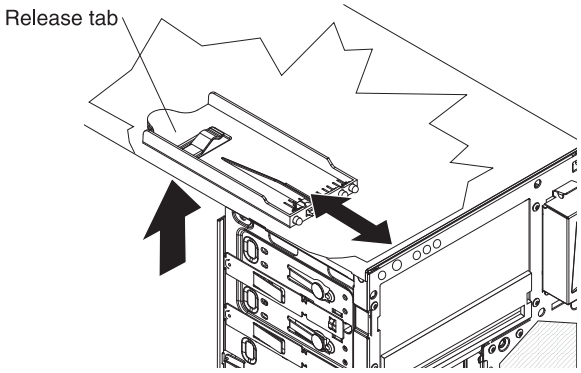


2. Tilt the top of the simple-swap backplate toward the drive cage and over the locating pins until the retaining latch is engaged securely.
3. Press and hold the retaining tab on top of the cage; then, rotate the drive cage into the chassis until it locks into place.
4. Connect the signal cables to the system board (see “System-board internal connectors” on page 8 for the location of the Serial ATA drive connectors).
5. Connect the power cables to the simple-swap backplate.
6. Install the hard disk drive fan assembly on the hard disk drive cage (see “Installing the hard disk drive fan assembly” on page 51).
7. Install the simple-swap hard disk drives that you removed from the hard disk drive cage (see “Installing a simple-swap hard disk drive” on page 40).
8. Install the lower bezel (see “Installing the lower bezel” on page 35).
9. Install the side cover (see “Installing the side cover” on page 31).
10. Lock the side cover if you unlocked it during removal.
11. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the front-panel assembly

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

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 30).
4. Remove the lower bezel (see “Removing the lower bezel” on page 34).
5. Remove the upper bezel (see “Removing the upper bezel” on page 32).
6. Slide the drives in bay 1 and bay 2 forward slightly (see for more information). It is not necessary to remove these drives.
7. If the server has hot-swap power supplies, remove the power supplies and the power-supply cage (see).
8. Disconnect the front-panel assembly cable from the system board, and note the routing of the cable (see “System-board internal connectors” on page 8 for the location of the front-panel connector).

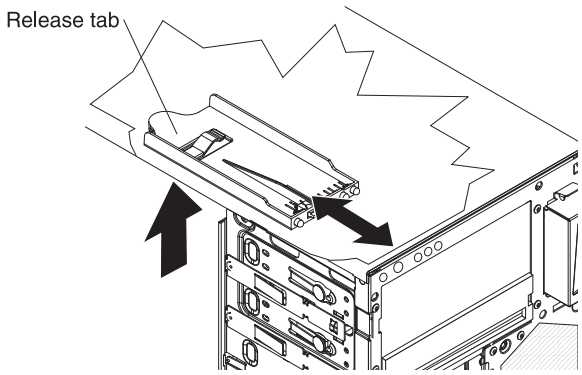


9. Press up on the release tab of the front-panel assembly and pull the assembly toward the rear of the server; then, remove the front-panel assembly from the chassis.
10. If you are instructed to return the front-panel assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the front-panel assembly

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

1. Position the front end of the front-panel assembly in the channel above drive bay 1 on the left side of the chassis.

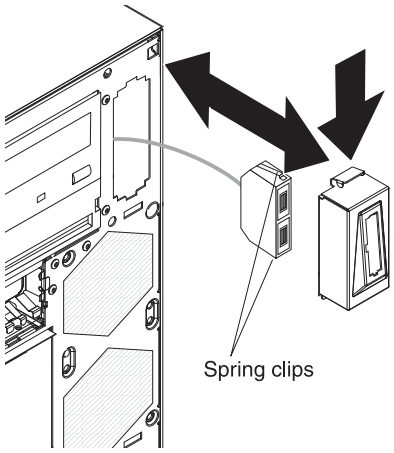


2. Push the front-panel assembly toward the front of the chassis until it clicks into place.
3. Reroute and connect the front-panel assembly cable to the system board (see “System-board internal connectors” on page 8 for the location of the front-panel connector).
4. Install the lower bezel (see “Installing the lower bezel” on page 35).
5. Install the upper bezel.
6. Install the side cover (see “Installing the side cover” on page 31).
7. Lock the side cover if you unlocked it during removal.
8. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the front USB connector assembly

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

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Remove the front upper bezel of the server
4. Unlock and remove the side cover (see “Removing the side cover” on page 30).
5. Disconnect the front USB cable from the system board, and note the routing of the cable (see “System-board internal connectors” on page 8 for the location of the front USB connector).
6. Press down and hold the release tab on the top of the front USB housing; then, tilt the top of the housing away from the chassis and lift the housing out of the opening in the chassis.



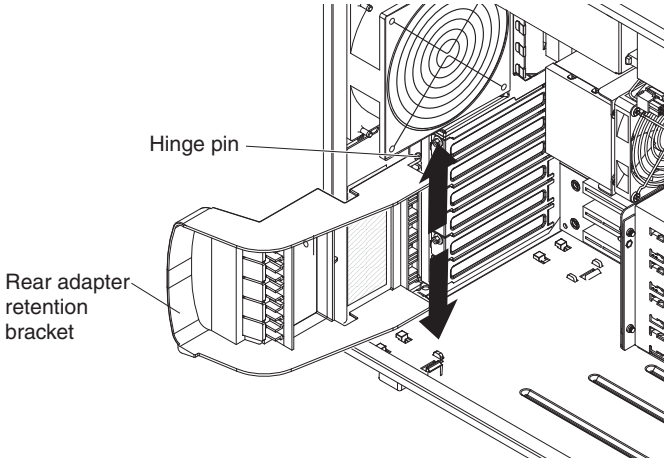
7. Squeeze the spring clips on the sides of the front USB connector assembly and pull the assembly out of the back of the housing.
8. Carefully pull the front USB cable out of the opening in the chassis.
9. If you are instructed to return the front USB connector assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Removing the rear adapter retention bracket

To remove the rear adapter-retention bracket, complete the following steps:

1. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
2. Unlock and remove the side cover (see “Removing the side cover” on page 30).
3. Remove all adapters (if necessary) and place the adapters on static-protective surface.

   Note: You might find it helpful to note where each adapter is installed before you remove the adapters.
4. Release the rear adapter-retention bracket by lifting up on the rear adapter-retention bracket, and rotate the bracket partially toward the closed position.
5. Grasp the bracket on one side at the hinge point and pull outward (while you rotate the bracket slightly toward the front of the server) until the bracket is free of the hinge pin; then, grasp the bracket on the other side at the hinge point, pull outward until the bracket is free of the hinge pin, and remove the rear adapter-retention bracket from the server.



6. If necessary, remove the Remote Supervisor Adapter II SlimLine retention tab and store it for future use.

Installing the rear adapter retention bracket

To install the rear adapter-retention bracket, complete the following steps:

1. If you removed the Remote Supervisor Adapter II SlimLine retention tab earlier, reinstall it on the rear adapter-retention bracket and any other adapters that you might have removed.
2. Position the rear adapter retention bracket so that the hole in one of the hinge points is aligned with the hinge pin on the chassis; then, place the hinge pin through the hole on the chassis.
3. Rotate the rear adapter-retention bracket into place so that the hole in the opposite hinge point snaps into place over the hinge pin on the chassis.
4. Install the side cover (see “Installing the side cover” on page 31).
5. Lock the side cover if you unlocked it during removal.
6. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Removing the front adapter-retention bracket

To remove the front adapter-retention bracket, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 30).
4. Open the front and rear adapter-retention brackets.
5. Remove all adapters (if necessary) and place them on a static-protective surface.

   Note: You might find it helpful to note where each adapter is installed before you remove the adapters.
6. Grasp one side of the bracket at a hinge point and pull outward (while you rotate the bracket slightly toward the rear of the server) until the hinge pin on the bracket is free of the hole; then, grasp the bracket on the other side at the hinge point, pull outward until the bracket is free of the hinge pin, and remove the rear adapter-retention bracket from the server.

Installing the front adapter-retention bracket

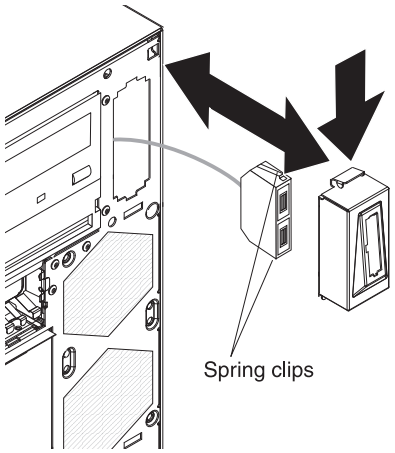
To install the front adapter-retention bracket, complete the following steps:

1. Insert one of the hinge pins on the front adapter-retention bracket into the metal hinge point on the fan cage assembly.
2. Rotate the other hinge pin on the front adapter-retention bracket into position and push the hinge pin into the other metal hinge point. The hinge pin will protrude through the hole in the metal hinge point when the adapter-retention bracket is seated correctly.
3. Reinstall any adapters that you removed earlier.
4. Close the front and rear adapter retention brackets.
5. Install the side cover (see “Installing the side cover” on page 31).
6. Lock the side cover.
7. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Installing the front USB connector assembly

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

1. Carefully insert the front USB cable through the opening in the front of the chassis.



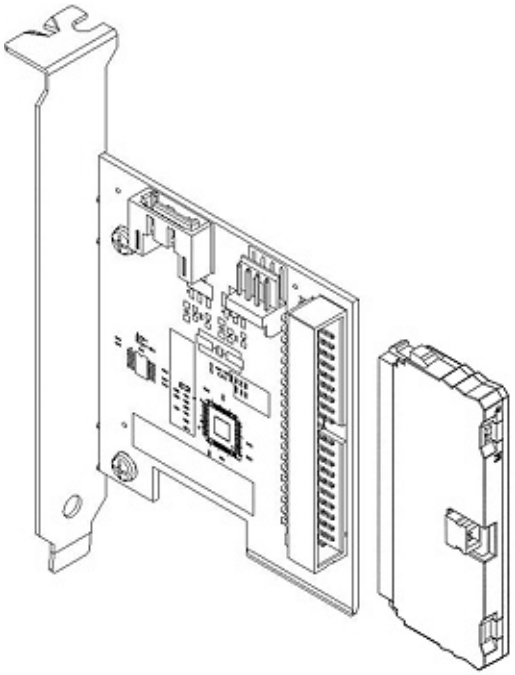
2. Squeeze the spring clips on the sides of the front USB connector assembly and insert the assembly into the housing through the back of the housing.
3. Place the bottom edge of the housing into the bottom of the opening in the chassis; then, tilt the top of the housing into position until it clicks into place.
4. Reroute and connect the front USB cable to the system board (see “System-board internal connectors” on page 8 for the location of the front USB connector).
5. Install the lower bezel (see “Installing the lower bezel” on page 35).
6. Install the side cover (see “Installing the side cover” on page 31).
7. Lock the side cover if you unlocked it during removal.
8. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Replacing a SATA interposer card and IDE PATA flash module

Although the SATA interposer card is a tier 2 CRU, it is always connected to the IDE PATA flash module, which is a tier 1 CRU. Therefore, the replacement of both

parts has been placed together in this section. To replace the SATA interposer card and IDE PATA flash module, complete the following:

1. With the server powered off and the power cable removed, detach the server side cover. See the section *Removing the side cover* for detailed information.
2. Remove the data cable and the power cable connected to the SATA interposer card as well as the power connector to the IDE PATA flash module (DOM). Be sure to note the exact location where the cables connect on both ends.
3. Detach the SATA interposer card card from the slot on the system board.
4. Attach the data and power cables to the replacement SATA interposer card as well as the power cable for the IDE PATA flash module.
5. Place the SATA interposer card into the same system board slot where the previous SATA interposer card sat.
6. Attach the screw to the card slot on the server.
7. Close the side cover of the server.

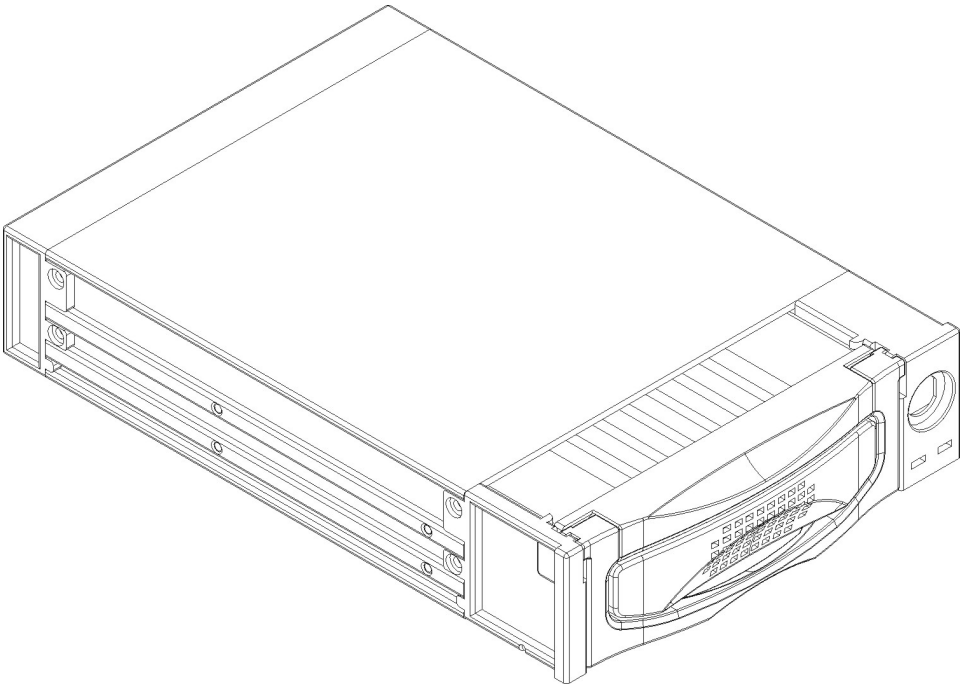


Replacing a hotswappable idb drive kit

The following section explains a hotswappable drive replacement in two parts. The first section describes how to remove the complete drive cage from the appliance cage itself. The second section explains how to replace a physical hard disk from the hotswappable drive case.

1. To replace the removable hard drive cage, complete the following:
   a. With the server powered off and the power cable removed, detach the side cover of the Lotus Foundations Appliance. See the section *Removing the side cover*, for instructions.
   b. Unlock and remove the hard drive tray (containing the hard drive) from the server.
   c. Detach the front upper bezel of the server.
   d. Remove the SATA cable and the power cable connected to both the removable drive cage and the system board. Be sure to note the exact location where the cables connect on both ends.

e. Remove the screws attaching the removable drive cage to the server cage.
f. Pull the removable drive cage out of the server cage.
g. Insert the new removable drive cage and attach the screws.
h. Attach the SATA and power cables to the removable drive cage. Then connect the other ends to on the system board as they were connected previously.
i. Attach both server side cover and the front upper bezel.
j. Insert the removable idb drive into the server and lock the drive.



2. To replace the hard drive tray, complete the following:
   a. If the server is powered on, ensure that the hard drive is in a hot swappable state before unlocking and removing from the removable hard drive cage. If the server is powered down, unlock the drive and remove it from the removable drive cage.
   b. Remove the screws from the upper cover of the drive tray.
   c. Detach the hard drive from the connector within the removable drive tray.
   d. Insert the new hard drive into the tray and connect the data and power cables.
   e. Attach the screws to the upper cover of the drive tray.
   f. Insert the removable hard drive tray into the server and lock the drive.

Removing and replacing FRUs

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

Removing a non-hot-swap power supply

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

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

Statement 8:

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

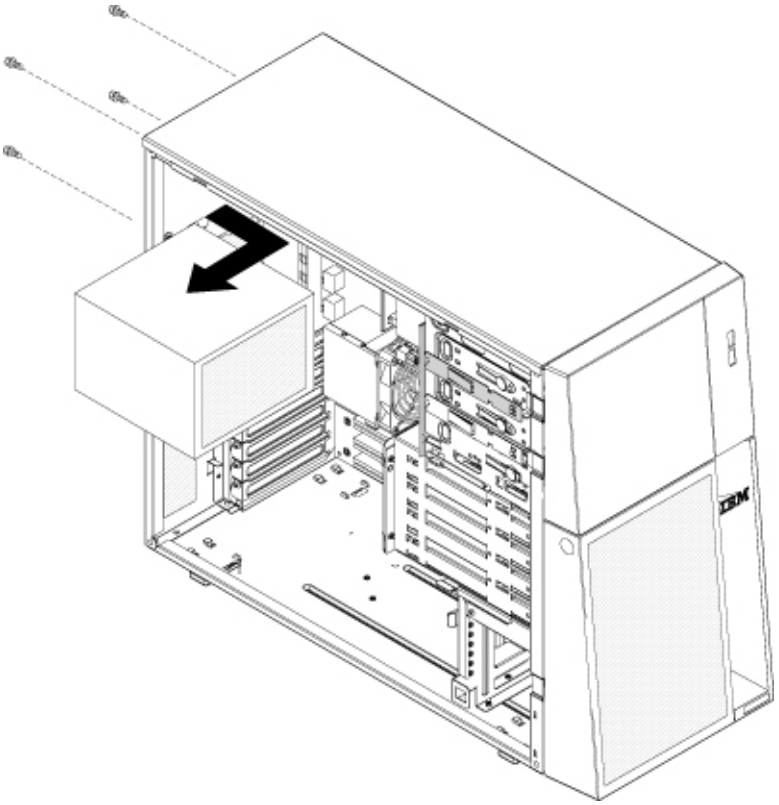
Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

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

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Unlock and remove the side cover (see “Removing the side cover” on page 30).

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

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



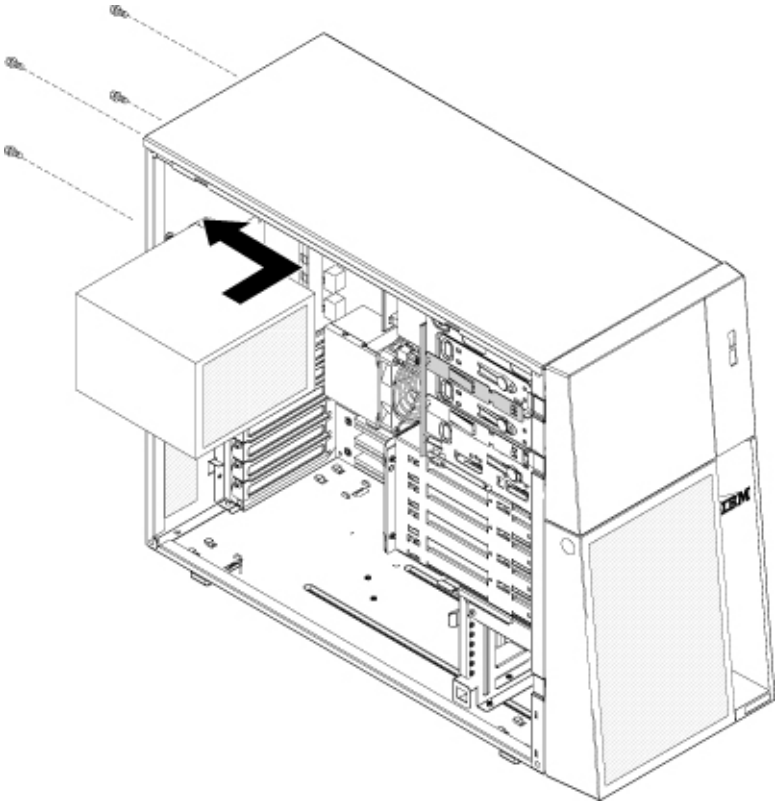
6. If you are instructed to return the power supply, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a non-hot-swap power supply

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

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

1. Position the power supply in the chassis so that the screw holes in the power supply are aligned with the corresponding holes in the rear of the chassis.



2. Install the four screws that secure the power supply to the chassis.
3. Connect the cables from the power supply to the system board and all internal components.
4. Install the side cover (see “Installing the side cover” on page 31).
5. Lock the side cover if you unlocked it during removal.
6. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

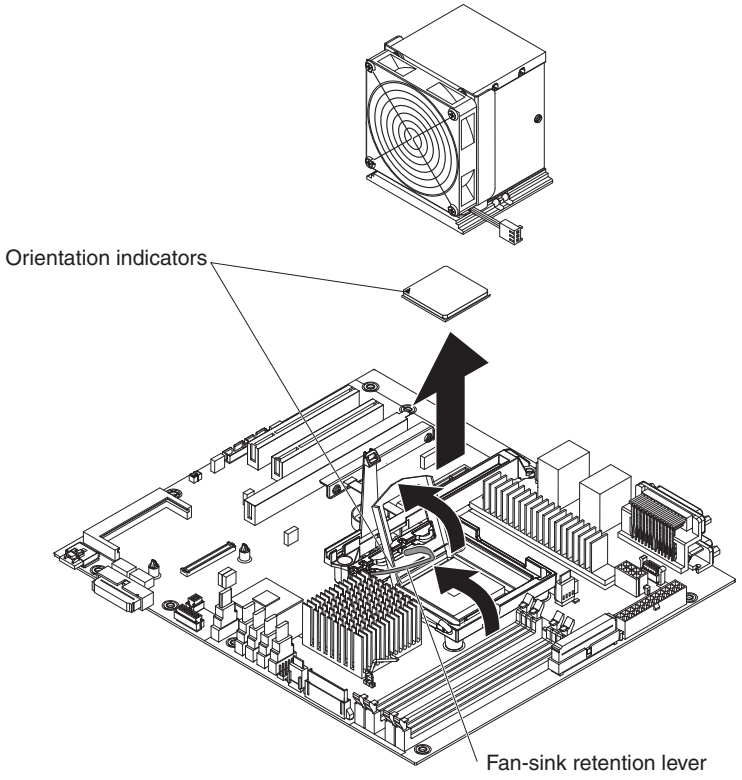
Removing the microprocessor and fan sink

To remove the microprocessor and fan sink, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Turn the server on its side so that it is lying flat, with the cover facing up.
4. Unlock and remove the side cover (see “Removing the side cover” on page 30).
5. Disconnect any cables that impede access to the fan sink and microprocessor.

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

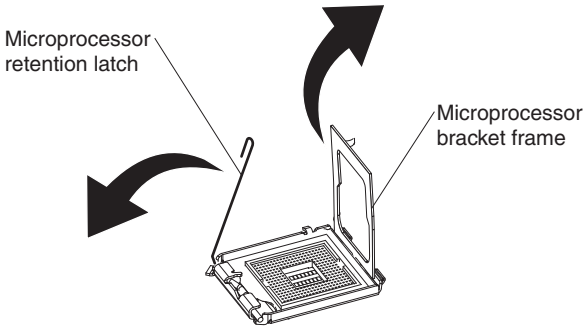
      Important: Be careful when you handle the microprocessor and fan sink. If the microprocessor and fan sink will be reused, do not contaminate the thermal material between them.



   c. Tip the top of the fan sink toward the front of the server while 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.

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

7. Release the microprocessor retention latch by pressing down on the end, moving it to the side, and slowly releasing it to the open (up) position.



8. Open the microprocessor bracket frame by lifting up the tab on the top edge.
9. Carefully lift the microprocessor straight up and out of the socket, and place it on a static-protective surface.
10. If you are instructed to return the microprocessor and fan sink, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

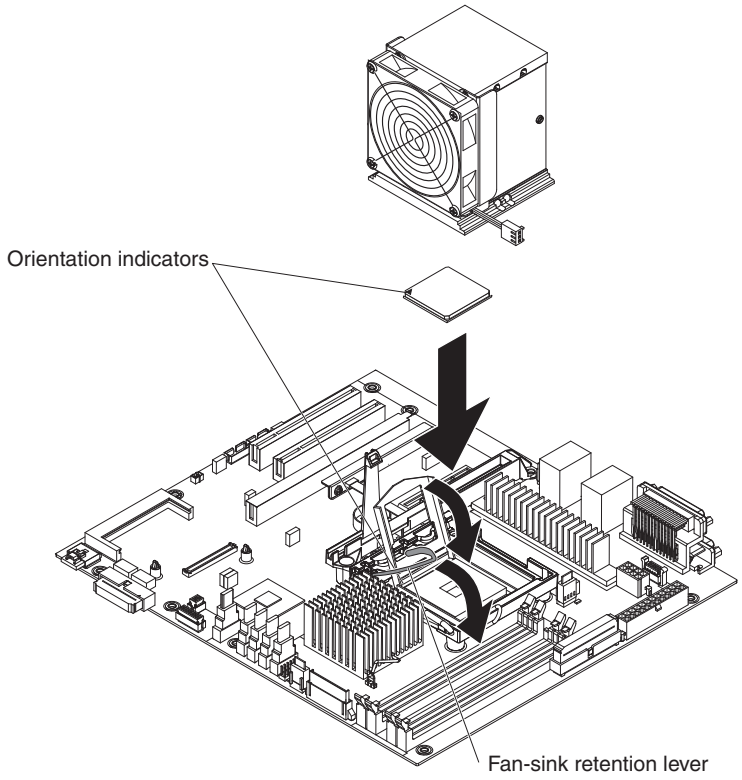
Installing a microprocessor and fan sink

To install the microprocessor, complete the following steps:

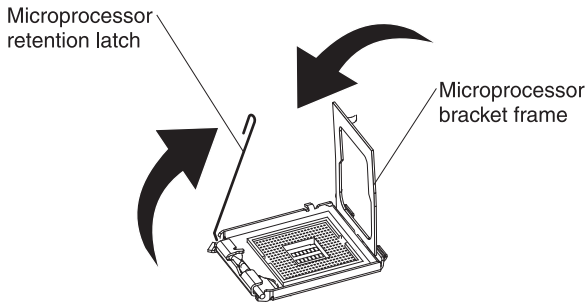
1. Touch the static-protective package that contains the microprocessor to any unpainted metal surface on the server. Then, remove the microprocessor from the package.
2. Remove the protective cover, tape, or label from the surface of the microprocessor socket, if any is present.
3. Rotate the release lever on the microprocessor socket to the fully open position.

   Attention: Make sure that the release lever on the microprocessor socket is in the fully open position before you insert the microprocessor in the socket. Failure to do so might result in permanent damage to the microprocessor, microprocessor socket, and system board.
4. Carefully grasp the microprocessor and place the microprocessor into the microprocessor socket.

   Note: To maintain correct orientation between the microprocessor and the microprocessor socket during installation, observe the following information:
   - The microprocessor has two notches that are keyed to two tabs on the sides of the socket.
   - A triangle-shaped indicator on one corner of the microprocessor points to a 45-degree angle on one corner of the socket.
   - Do not use excessive force when you press the microprocessor into the socket.

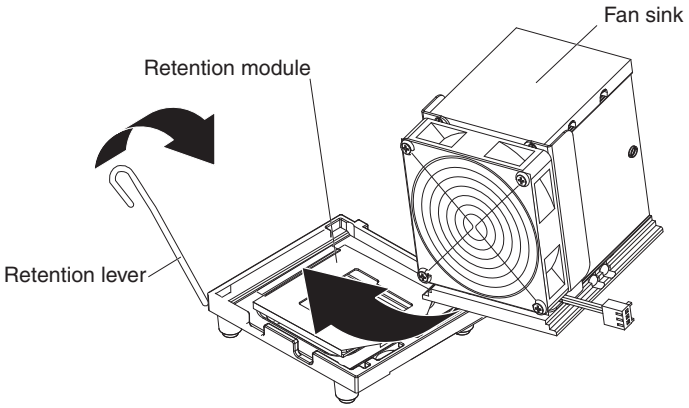


5. Close the microprocessor bracket frame; then, close the microprocessor retention latch and lock it securely in place.



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

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



   b. Slide the bottom edge of the fan sink under the lower flange of the retention module; then, place the top of the fan sink onto the top of the retention module.
   c. Close the fan-sink retention lever and lock it securely in place.
   d. Reconnect the fan-sink cable to the system board (see “System-board internal connectors” on page 8 for the location of the fan-sink connector).
7. Reconnect any cables that you disconnected during the removal of the old microprocessor.
8. Install the side cover (see “Installing the side cover” on page 31).
9. Lock the side cover if you unlocked it during removal.
10. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Thermal grease

The thermal grease must be replaced whenever the fan sink has been removed from the top of the microprocessor and is going to be reused or when debris is found in the grease.

When you are installing the fan sink on the same microprocessor that is was removed from, make sure that:

- The thermal grease on the fan sink and microprocessor is not contaminated.
- Additional thermal grease is not added to the existing thermal grease on the fan sink and microprocessor.

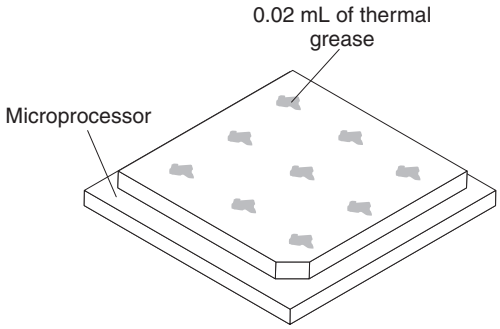
Note:

- Read the Safety information on page vii.
- Read the “Installation guidelines” on page 25.
- Read “Handling static-sensitive devices” on page 28.

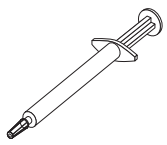
To replace damaged or contaminated thermal grease on the microprocessor and fan sink, complete the following steps:

1. Place the fan sink on a clean work surface.
2. Remove the cleaning pad from its package and unfold it completely.
3. Use the cleaning pad to wipe the thermal grease from the bottom of the fan sink.

   Note: Make sure that all of the thermal grease is removed.
4. Use a clean area of the cleaning pad to wipe the thermal grease from the microprocessor; then, dispose of the cleaning pad after all of the thermal grease is removed.



5. Use the thermal-grease syringe to place 9 uniformly spaced dots of 0.02 mL each on the top of the microprocessor. The outermost dots must be within approximately 5 mm of the edge of the microprocessor, this is to ensure uniform distribution of the grease.

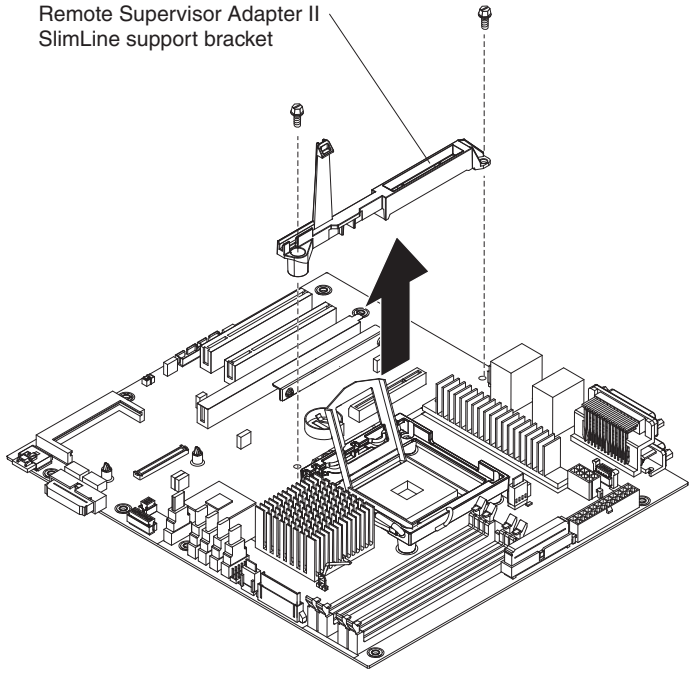


   Note: If the grease is properly applied, approximately half of the grease will remain in the syringe.
6. Install the fan sink onto the microprocessor as described in “Installing a microprocessor and fan sink” on page 67.

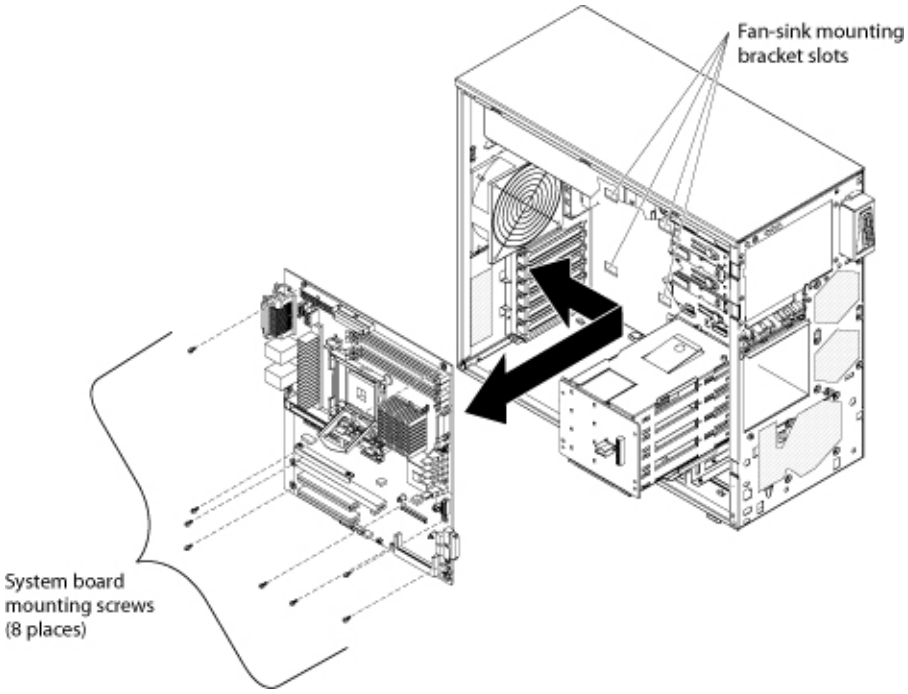
Removing the system board

To remove the system board, complete the following steps:

1. Read the safety information that begins on page vii and “Installation guidelines” on page 25.
2. Turn off the server and all attached devices; then, disconnect all power cords and external cables.
3. Turn the server on its side so that it is lying flat, with the cover facing up.
4. Unlock and remove the side cover (see “Removing the side cover” on page 30).
5. Note where each cable is connected; then, disconnect all cables from the system board.
6. Press and hold the drive cage release tab; then, rotate the drive cage out of the chassis until the retaining tab on top of the cage locks into place.
7. Remove any of the following components (in addition to others that might not be listed) that are installed on the system board and put them in a safe, static-protective place:
   - Adapters (see “Removing an adapter” on page 36).
   - Microprocessor and fan sink (see “Removing the microprocessor and fan sink” on page 65).
   - DIMMs (see “Removing a memory module” on page 41).
   - Battery (see “Removing the battery” on page 45).
8. Remove the two screws that secure the Remote Supervisor Adapter II SlimLine support bracket to the system board and remove the Remote Supervisor Adapter II SlimLine support bracket from the system board. Set it aside for use later.

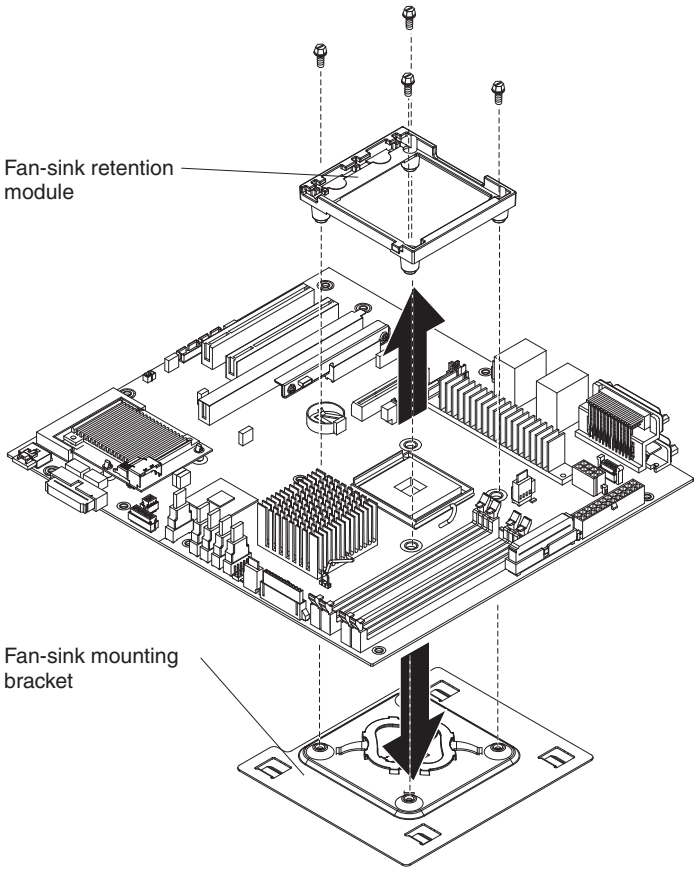


9. Remove the eight screws that secure the system board to the chassis.



10. Slide the system board toward the front of the server to disengage the tabs on the fan sink mounting bracket from the slots on the bottom of the chassis; then, carefully lift the system board out of the server.
11. Remove the four screws that secure the fan sink retention module and fan sink mounting bracket to the system board; then, set the fan sink retention module, fan sink mounting bracket, and screws aside for use later.

    Note: Make sure that you observe the orientation of the fan sink retention module before you move it so that when you reinstall it, you install it in the same orientation.

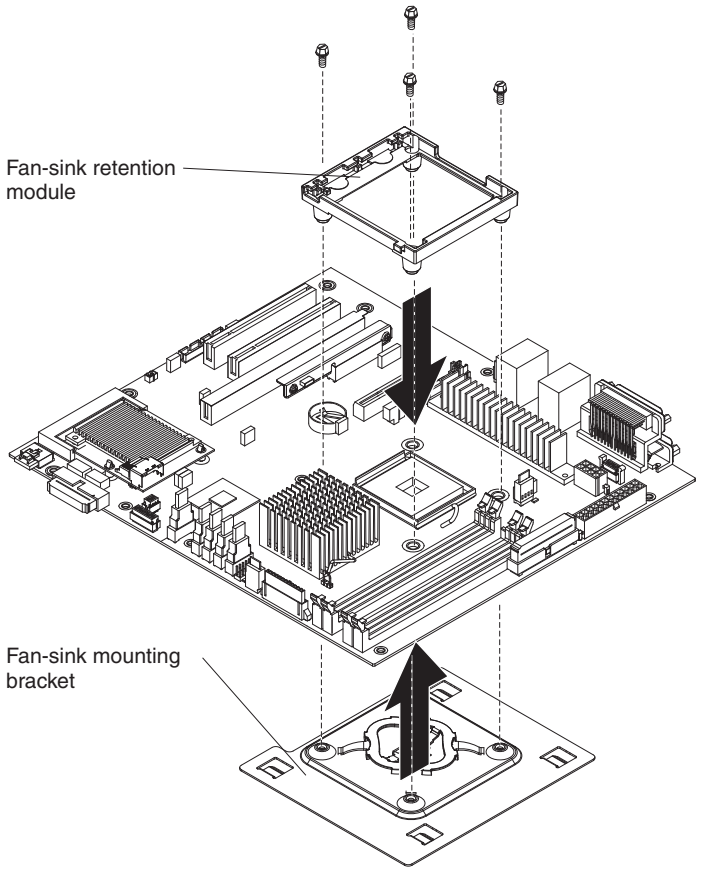


12. If you are instructed to return the system board, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the system board

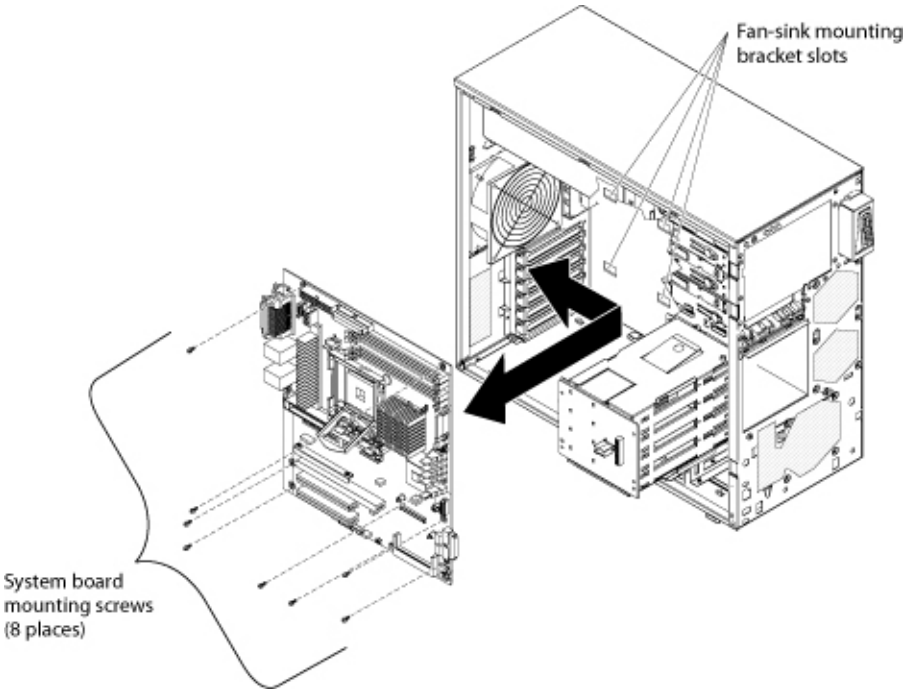
To install the system board, complete the following steps:

1. Touch the static-protective package that contains the system board to any unpainted metal surface on the server. Then, remove the system board from the package.
2. Place the fan sink mounting bracket underneath the system board and align the holes on fan sink mounting bracket with the four screw holes for the fan sink retention module slot on system board. Place the fan sink retention module on top of the system board and align it with the four screw holes for the fan sink retention module slot (make sure that the fan sink retention module orientation of the is correct). Take the four screws that you removed earlier and secure the fan sink mounting bracket and the fan sink retention module to the system board.

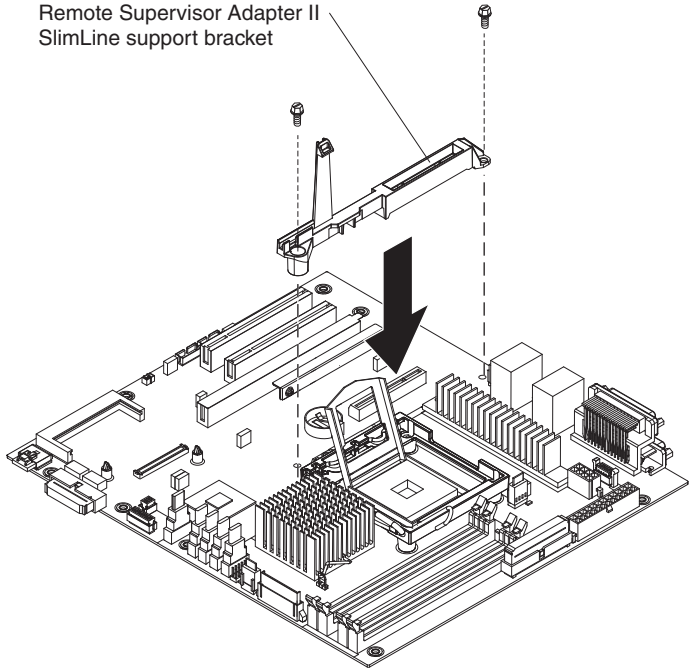


3. Insert the system board into the chassis and slide it toward the rear of the server until the tabs on the fan sink mounting bracket is fully engaged in the holes for fan sink mounting bracket slots on the bottom the chassis.

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



4. Install the eight screws that secure the system board to the chassis.
5. Reinstall the Remote Supervisor Adapter II SlimLine support bracket with the two screws that you removed earlier.



6. Install any of the following components that you removed from the system board:
   - SAS/SATA controller (see).
   - Battery (see “Installing the battery” on page 45).
   - DIMMs (see “Installing a memory module” on page 42).

- Microprocessor and fan sink (see “Installing a microprocessor and fan sink” on page 67).
- Adapters (see “Installing an adapter” on page 37).

7. Press and hold the retaining tab on top of the cage; then, rotate the drive cage into the chassis until it locks into place.
8. Reconnect any cables to the system board that you disconnected during removal.
9. Install the side cover (see “Installing the side cover” on page 31).
10. Lock the side cover if you unlocked it during removal.
11. Reconnect the external cables and power cords; then, turn on the attached devices and turn on the server.

Chapter 5. Diagnostics

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

If you cannot diagnose and correct a problem by using the information in this chapter, see Appendix A, “Getting help and technical assistance,” on page 121 for more information.

Diagnostic tools

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

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

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

  These tables list problem symptoms and actions to correct the problems. See “Troubleshooting tables” on page 96.
- **Server LEDs**

  Use the LEDs on the server to diagnose system errors quickly. See “Error LEDs” on page 106 for more information.
- **Diagnostic programs and messages** The Dynamic System Analysis (DSA) diagnostic programs are the primary method of testing the major components of the server. The DSA diagnostic programs are available on the IBM *Dynamic System Analysis Preboot Diagnostic* CD that is shipped with the Lotus Foundations Appliance and is also available online. To obtain the DSA program online:
  1. Go the following IBM Web page: http://www-947.ibm.com/systems/support/supportsite.wss/brandmain?brandind=5000008
  2. From the *Product family* drop-down box, select *Lotus Foundations Appliance*
  3. From the *Operating systems* drop-down box, select *All listed operating systems*, then click *Go*.
  4. The screen will refresh with additional search options. From the *Refine results* drop-down box, select *Diagnostics* and click *Go*.
  5. Download the DSA .iso image and burn it to a CD. Also be sure to download and read the available *readme.txt* file for detailed instructions on how to use the DSA program.

Attention: Because the Lotus Foundations Appliance does not ship with a CD/DVD drive, you will need to connect a removable USB CD/DVD drive to the back of the unit in order to use the DSA program.

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, one short beep occurs, and the server startup is completed.

If POST detects a problem, several beeps might sound, or an error message is displayed. See “POST beep codes” on page 79 and “POST error codes” on page 84 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.

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 multiple error codes indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 98 for information about diagnosing microprocessor problems.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, “Parts listing, Lotus Foundations Appliance Type 9234,” on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.**

Beep code	Description	Action
One short beep	Indicates successful completion of POST, with no errors.	None
1-1-3	CMOS write/read test failed.	1. Reseat the battery. 2. Clear CMOS. See “System-board jumpers” on page 12 for information about how to clear CMOS. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. (Trained service technician only) System board
1-1-4	BIOS ROM checksum failed.	1. Recover the BIOS code. 2. (Trained service technician only) Replace the system board.
1-2-1	Programmable interval timer failed.	(Trained service technician only) Replace the system board.
1-2-2	DMA initialization failed.	(Trained service technician only) Replace the system board.
1-2-3	DMA page register write/read failed.	(Trained service technician only) Replace the system board.

- **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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Beep code	Description	Action
1-2-4	RAM refresh verification failed.	1. Reseat the DIMMs. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. DIMMs b. (Trained service technician only) System board
1-3-1	First 64 K RAM test failed.	1. Reseat the DIMMs. 2. Clear CMOS. See "System-board jumpers" on page 12 for information about how to clear CMOS. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. DIMMs b. (Trained service technician only) System board
2-1-1	Secondary DMA register failed.	(Trained service technician only) Replace the system board.
2-1-2	Primary DMA register failed.	(Trained service technician only) Replace the system board.
2-1-3	Primary interrupt mask register failed.	(Trained service technician only) Replace the system board.
2-1-4	Secondary interrupt mask register failed.	(Trained service technician only) Replace the system board.
2-3-4	Search for video ROM failed.	(Trained service technician only) Replace the system board.
3-3-2	Critical SMBUS error occurred.	1. Disconnect the power cord, wait 30 seconds, and retry. 2. Reseat the following components: a. DIMM b. System board 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. DIMM b. (Trained service technician only) System board

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

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

No-beep symptoms

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

Table 4. No-beep code symptoms

- **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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

No-beep symptom	Description	Action
No beeps occur, and the server operates correctly.		1. (Trained service technician only) Reseat the front information panel LED cable. 2. (Trained service technician only) Replace the front information panel LED assembly.
No beeps occur, and there is no video.		See "Solving undetermined problems" on page 119.

Error logs

The server generates three error logs:

- **POST error log**

  This log contains the three most recent error codes and messages that were generated during POST.
- **System-event/error log**

  This log contains messages that were generated during POST and all system status messages from the service processor.
- **BMC system event log**

  This log contains messages that were generated by the mini-BMC controller.

The system event/error log and mini-BMC system event log are limited in size. When these logs are full, new entries will not overwrite existing entries; therefore, you must periodically clear them through the Configuration/Setup Utility program (the menu choices are described in the Chapter 2 of this guide). When you are troubleshooting an error, be sure to clear both logs so that you can find current errors more easily.

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

Entries that are written to the system-event/error log and mini-BMC system event 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.

Viewing error logs from the Configuration/Setup Utility program

For complete information about using the Configuration/Setup Utility program, see Chapter 2 of this guide.

To view the error logs from the Configuration/Setup Utility program, complete the following steps:

1. Turn on the computer.
2. When the prompt `Press F1 for Configuration/Setup` is displayed, press F1.
3. Use one of the following procedures:
   - To view the POST error log and system-event/error log, select **Event/Error Logs** → **System Event/Error Log**.
   - To view the BMC system-event log, select **Advanced Setup** → **Baseboard Management Controller (BMC) Setting** → **BMC System Event Log**.

Viewing the mini-BMC system-event log from the diagnostic programs

The BMC system-event log that is generated by the mini-BMC controller contains the same information, whether it is viewed from the Configuration/Setup Utility program or from the diagnostic programs.

To view the BMC system-event log that is generated by the mini-BMC controller from 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 `F2 for Diagnostics` is displayed, press F2. If you have set both a power-on password and an administrator password, you must type the administrator password to run the diagnostic programs.
4. From the top of the screen, select **Hardware Info**.
5. From the list, select **BMC log**.

POST error codes

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

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
062	Three consecutive boot failures using the default configuration.	1. Update the system firmware to the latest level (see "Updating the firmware" on page 13). 2. (Trained service technician only) Replace the system board.
101	Tick timer internal interrupt failure.	(Trained service technician only) Replace the system board.
102	Internal timer channel 2 test failure.	(Trained service technician only) Replace the system board.
106	Diskette controller error.	1. Make sure that the Configuration/Setup Utility program correctly reflects the diskette drive information. 2. Reseat the diskette drive cable. 3. Reseat the diskette drive. 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. Diskette drive cable b. Diskette drive c. (Trained service technician only) System board
151	Real-time clock error.	1. Reseat the battery. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. (Trained service technician only) System board

- **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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
162	Invalid configuration information or CMOS random-access memory (RAM) checksum failure.	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings. 2. Reseat the following components: a. Battery b. Failing device (if the device is a FRU, the device must be reseated by a trained service technician only) 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. Failing device (if the device is a FRU, the device must be replaced by a trained service technician only) c. (Trained service technician only) System board
163	Time of day not set.	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, make sure that the date and time are correct, and save the settings. 2. Reseat the battery. 3. Clear CMOS. See "System-board jumpers" on page 12 for information about how to clear CMOS. 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. (Trained service technician only) System board
164	Memory size has changed.	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, make sure that the date and time are correct, and save the settings. 2. Reseat the battery. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. (Trained service technician only) System board

- **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, Lotus Foundations Appliance Type 9234," on page 19 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
175	Service processor flash code damaged or not loaded.	1. Update the Remote Supervisor Adapter II SlimLine firmware. 2. Replace the Remote Supervisor Adapter II SlimLine.
178	Security hardware error.	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings. 2. (Trained service technician only) Replace the system board.
184	Power-on password damaged.	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings. 2. Reseat the battery. 3. Clear CMOS. See "System-board jumpers" on page 12 for information about how to clear CMOS. 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. Battery b. (Trained service technician only) System board
187	VPD serial number not set.	1. Set the serial number by updating the BIOS code level (see "Updating the firmware" on page 13). 2. (Trained service technician only) Replace the system board.
188	Service processor firmware corrupted or not installed.	1. Restart the server. 2. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings. 3. Update the Remote Supervisor Adapter II SlimLine firmware (see"Updating the firmware" on page 13). 4. (Trained service technician only) Replace the system board.
189	Three attempts were made to access the server with an incorrect password.	Restart the server and enter the administrator password; then, run the Configuration/Setup Utility program and change the power-on password.
289	A DIMM has been disabled by system.	1. Make sure that the DIMM is installed correctly (see "Installing a memory module" on page 42). 2. Replace the DIMM. 3. (Trained service technician only) Replace the system board.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 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
602	Invalid diskette boot record	1. Replace the diskette. 2. Reseat the diskette drive cables. 3. Replace the diskette drive.
604	Internal diskette drive error	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings. 2. Reseat the diskette drive signal cables. 3. Replace the diskette drive.
962	Parallel port configuration error	1. Run the Configuration/Setup Utility program and make sure that the parallel port setting is correct. 2. (Trained service technician only) Replace the system board.
1162	Serial port error	1. Run the Configuration/Setup Utility program and make sure that the serial port settings are correct. 2. (Trained service technician only) Replace the system board.
1600	The service processor is not functioning.	(Trained service technician only) Replace the system board.
1601	System-management adapter communication error.	1. Update the BMC firmware (see "Updating the firmware" on page 13). 2. (Trained service technician only) Replace the system board.
1603	System-management adapter communication error.	1. Make sure that the Remote Supervisor Adapter II SlimLine is installed correctly. 2. Update the Remote Supervisor Adapter II SlimLine firmware (see "Updating the firmware" on page 13). 3. Reseat the following components: a. Adapter b. (Trained service technician only) System board 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. Remote Supervisor Adapter II SlimLine b. (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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
1762	Hard disk drive configuration error.	1. Run the Configuration/Setup Utility program and load the default settings. 2. Reseat the following components: a. Hard disk drive cables b. Hard disk drive c. (Trained service technician only) System board 3. Replace the following components one at a time, in the order shown, restarting the server each time. a. Hard disk drive cables b. Hard disk drive c. (Trained service technician only) System board
178*x*	Fixed disk error. **Note:** *x* is the drive that has the error.	1. Run the hard disk drive diagnostic tests on drive *x*. 2. Reseat the following components, depending on the server model: • Hot-swap models: a. Hard disk drive *x* b. SAS/SATA controller • Simple-swap models: a. Hard disk drive *x* b. Hard disk drive *x* cable 3. Replace the following components one at a time, depending on the server model, in the order shown, restarting the server each time: • Hot-swap models: a. Hard disk drive *x* b. Hard disk drive backplane c. SAS/SATA controller • Simple-swap models: a. Hard disk drive *x* b. Hard disk drive *x* cable 4. (Trained service technician only) Replace the system board.
1800	Unavailable PCI hardware interrupt.	1. Run the Configuration/Setup Utility program and adjust the adapter settings. 2. Remove each adapter one at a time, restarting the server each time, until the failing adapter is isolated.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
1801	A PCI adapter has requested memory resources that are not available.	1. Make sure that no devices have been disabled in the Configuration/Setup Utility program. 2. Change the order of the adapters in the PCI, and PCI Express slots. Make sure that the startup (boot) device is positioned early in the scanning order. 3. Make sure that the settings for the adapter and all other adapters in the Configuration/Setup Utility program are correct. If the memory resource settings are not correct, change them. 4. If all memory resources are being used, remove an adapter to make memory available to the adapter. Disabling the BIOS on the adapter should correct the error. See the documentation that comes with the adapter.
1802	No more I/O space is available for a PCI adapter.	1. If the error code indicates a particular PCI or PCI-E slot or device, remove that device. 2. Reseat each adapter. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Failing PCI or PCI Express adapter b. (Trained service technician only) System board
1803	No more memory (above 1 MB for a PCI adapter).	1. If the error code indicates a particular PCI or PCI-E slot or device, remove that device. 2. Reseat each adapter. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Failing PCI or PCI Express adapter b. (Trained service technician only) System board
1804	No more memory (below 1 MB for a PCI adapter).	1. Remove the failing adapter. 2. Reseat each adapter. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Failing PCI or PCI Express adapter b. (Trained service technician only) System board

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 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
1805	PCI option ROM checksum error.	1. Remove the failing adapter. 2. Reseat each adapter. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Failing PCI or PCI Express adapter b. (Trained service technician only) System board
1806	PCI built in self-test failure.	1. If the error code indicates a particular PCI or PCI-Express slot or device, remove that device. 2. Reseat the following components: a. Each adapter b. (Trained service technician only, if the specified board is a FRU) The board that is indicated in the error code. (See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine CRU or FRU status.) 3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.
1807	General PCI error.	1. Make sure that no devices have been disabled in the Configuration/Setup Utility program. 2. Replace each adapter one at a time, restarting the server each time.

- **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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
1962	A hard disk drive does not contain a valid boot sector.	1. Make sure that a bootable operating system is installed. 2. Run the hard disk drive diagnostic tests. 3. Reseat the following components, depending on the server model: • Hot-swap models: a. Hard disk drive b. SAS/SATA controller • Simple-swap models: a. Hard disk drive b. Hard disk drive cable 4. Replace the following components one at a time, depending on the server model, in the order shown, restarting the server each time: • Hot-swap models: a. Hard disk drive b. Hard disk drive backplane c. SAS/SATA controller • Simple-swap models: a. Hard disk drive b. Hard disk drive cable 5. (Trained service technician only) Replace the system board.
2462	Video memory configuration error.	1. Reseat the following components: a. Video adapter (if one is installed) b. (Trained service technician only) System board 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. Video adapter (if one is installed) b. (Trained service technician only) System board
3001	SMART monitoring failure predicted on hard disk drive	Replace the hard disk drive.
3003	SMART command execution failure on hard disk drive	Replace the hard disk drive.
3005	Current hard disk drive configuration do not support SMART function	Replace the hard disk drive.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
5962	DVD drive configuration error.	1. Run the Configuration/Setup Utility program and load the default settings (see "Using the Configuration/Setup Utility program" on page 13). 2. Reseat the following components: a. DVD drive cable b. DVD drive c. System board 3. Replace the components listed in step 2 one at a time, in the order shown, restarting the server each time.
00012000	Processor machine check error.	1. (Trained service technician only) Reseat the microprocessor. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. (Trained service technician only) Microprocessor b. (Trained service technician only) System board
00019701	Microprocessor 1 failed the built in self-test (BIST).	1. (Trained service technician only) Reseat the microprocessor. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. (Trained service technician only) Microprocessor b. (Trained service technician only) System board
01298001	No update data for microprocessor 1.	1. Update the BIOS code again (see "Updating the firmware" on page 13). 2. (Trained service technician only) Reseat the microprocessor. 3. (Trained service technician only) Replace the microprocessor.
01298101	Bad update data for processor 1.	1. Update the BIOS code again (see "Updating the firmware" on page 13). 2. (Trained service technician only) Reseat the microprocessor. 3. (Trained service technician only) Replace the microprocessor.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
I9990301	Hard disk drive boot sector error.	1. Reseat the following components, depending on the server model: • Hot-swap models: a. Hard disk drive b. SAS/SATA controller • Simple-swap models: a. Hard disk drive b. Hard disk drive cable 2. Replace the following components one at a time, depending on the server model, in the order shown, restarting the server each time: • Hot-swap models: a. Hard disk drive b. Hard disk drive backplane c. SAS/SATA controller • Simple-swap models: a. Hard disk drive b. Hard disk drive cable 3. (Trained service technician only) Replace the system board.
I9990650	AC power has been restored.	1. Reseat the power cords. 2. Check for interruption of the external power. 3. Replace the power cords.

Checkout procedure

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

About the checkout procedure

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

- Read the safety information that begins on page vii.
- When you run the diagnostic programs, a single problem might cause more than one error message. When this happens, correct the cause of the first error message. The other error messages usually will not occur the next time you run the diagnostic programs.

  Exception: If multiple error codes or LEDs indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 98 for information about diagnosing microprocessor problems.
- For information about power-supply problems, see “Solving power problems” on page 117.
- For intermittent problems, check the error log; see “Error logs” on page 82 and .

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. Make sure that both the ac and dc power supply LEDs on the rear of the power supply are lit, indicating that the power supply is operating correctly (see “Power-supply LEDs” on page 107).
   b. Turn off the server and all external devices.
   c. Check all internal and external devices for compatibility at http://www.ibm.com/servers/eserver/serverproven/compat/us/.
   d. Check all cables and power cords.
   e. Set all display controls to the middle positions.
   f. Turn on all external devices.
   g. Turn on the server. If the server does not start, see “Troubleshooting tables” on page 96.
   h. Check the system-error LED on the front panel. If it is lit, check the LEDs on the system board (see “Error LEDs” on page 106).

      Important: If the system-error LED on the front of the server is lit but there are no other error indications, clear the BMC system-event log. This log does not clear itself, and if it begins to fill up, the system-error LED will be lit. Also, after you complete a repair or correct an error, clear the BMC system-event log to turn off the system-error LED on the front of the server.
   i. Check for the following results:
      - Successful completion of POST, indicated by one beep
      - Successful completion of startup
3. Did more than one beep sound, or was a POST error code displayed?
   - **Yes:** Find the beep code or error code in “POST beep codes” on page 79 or “POST error codes” on page 84; if necessary, see “Solving undetermined problems” on page 119.
   - **No:** Find the failure symptom in “Troubleshooting tables” on page 96; if necessary, run the diagnostic programs.
     – If you receive an error, consult the available DSA documentation either on the CD or in the provided documentation (see the section *Diagnostics* in this guide).
     – If the diagnostic programs were completed successfully and you still suspect a problem, see “Solving undetermined problems” on page 119.

Troubleshooting tables

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

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

1. Check the LEDs on the front panel or the system board (see “Error LEDs” on page 106).
2. Remove the software or device that you just added.
3. Run the diagnostic tests to determine whether the server is running correctly.
4. Reinstall the new software or new device.

General problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, “Parts listing, Lotus Foundations Appliance Type 9234,” on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.**

Symptom	Action
A cover lock is broken, an LED is not working, or a similar problem has occurred.	If the part is a CRU, replace it. If the part is a FRU, the part must be replaced by a trained service technician.

Hard disk drive problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, “Parts listing, Lotus Foundations Appliance Type 9234,” on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.**

Symptom	Action
Not all drives are recognized by the hard disk drive diagnostic test (the Fixed Disk Test or the SCSI Attached Disk test).	Remove the drive that is indicated on the diagnostic tests; then, run the hard disk drive diagnostic test again. If the remaining drives are recognized, replace the drive that you removed with a new one.
The server stops responding during the hard disk drive diagnostic test.	Remove the hard disk drive that was being tested when the server stopped responding, and run the diagnostic test again. If the hard disk drive diagnostic test runs successfully, replace the drive that you removed with a new one.
A hard disk drive was not detected while the operating system was being started.	Reseat all hard disk drives and cables; then, run the hard disk drive diagnostic tests again.
A hard disk drive passes the diagnostic Fixed Disk Test but the problem remains.	Run the diagnostic SCSI Attached Disk test. **Note:** Use the SCSI Attached Disk test for drives that are part of RAID arrays. Use the Fixed Disk test for SATA drives that are not part of RAID arrays

Intermittent problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
A problem occurs only occasionally and is difficult to diagnose.	1. Make sure that: • All cables and cords are connected securely to the rear of the server and attached devices. • When the server is turned on, air is flowing from the fan grille. If there is no airflow, the fan is not working. This can cause the server to overheat and shut down. 2. Check the system event/error log (see "Error logs" on page 82). 3. See "Solving undetermined problems" on page 119.

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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The amount of system memory that is displayed is less than the amount of installed physical memory.	1. Make sure that: • No error LEDs are lit on the front-panel assembly or on the system board. • The memory modules are seated correctly. • You have installed the correct type of memory. • If you changed the memory, you updated the memory configuration in the Configuration/Setup Utility program. • All DIMMs are enabled. The server might have automatically disabled a DIMM when it detected a problem. • If a DIMM was disabled by a system-management interrupt (SMI), replace the DIMM. 2. Check the POST error log for error message 289. If POST error message 289 is in the error log, perform the actions listed in the POST error codes table (see "POST error codes" on page 84). Otherwise, continue to step 3. 3. Run memory diagnostics. 4. Make sure that there is no memory mismatch when the server contains more than the minimum memory configuration (one 512 MB DIMM) and that you have installed the correct number of DIMMs. 5. Reseat the DIMMs. 6. Replace the following components one at a time, in the order shown, restarting the server each time: a. DIMMs b. (Trained service technician only) System board

Microprocessor problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

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

Monitor or video problems

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

- **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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
Testing the monitor	1. Make sure that the monitor cables are firmly connected. 2. Try using a different monitor on the server, or try using the monitor that is being tested on a different server. 3. Run the diagnostic programs. If the monitor passes the diagnostic programs, the problem might be a video device driver. 4. Reseat the Remote Supervisor Adapter II SlimLine (if one is installed). 5. Replace the Remote Supervisor Adapter II SlimLine. 6. (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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The screen is blank.	1. Make sure that: • The server is turned on. If there is no power to the server, see "Power problems" on page 101. • The monitor cables are connected correctly. • The monitor is turned on and the brightness and contrast controls are adjusted correctly. • A single beep sounds when the server is turned on, indicating the successful completion of POST. 2. Make sure that the correct server is controlling the monitor, if applicable. 3. Make sure that damaged BIOS code is not affecting the video; see "Updating (flash-update) the BIOS code on the server" on page 109. 4. See "Solving undetermined problems" on page 119.
The monitor works when you turn on the server, but the screen goes blank when you start some application programs.	1. Make sure that: • The application program is not setting a display mode that is higher than the capability of the monitor. • You installed the necessary device drivers for the application. 2. Run video diagnostics. • If the server passes the video diagnostics, the video is good; see "Solving undetermined problems" on page 119. • (Trained service technician only) If the server fails the video diagnostics, replace the system board.
The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.	1. If the monitor self-tests show that the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. **Attention:** Moving a color monitor while it is turned on might cause screen discoloration. Move the device and the monitor at least 305 mm (12 in.) apart, and turn on the monitor. **Notes:** a. To prevent diskette drive read/write errors, make sure that the distance between the monitor and any external diskette drive is at least 76 mm (3 in.). b. Non-IBM monitor cables might cause unpredictable problems. 2. Reseat the monitor cable. 3. Reseat the Remote Supervisor Adapter II SlimLine (if one is installed). 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. Monitor b. Remote Supervisor Adapter II SlimLine c. (Trained service technician only) System board

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
Wrong characters appear on the screen.	1. If the wrong language is displayed, update the BIOS code with the correct language (see "Updating the firmware" on page 13). 2. Reseat the monitor cable. 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Monitor b. (Trained service technician only) System board

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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The power-control button does not work (the server does not start). **Note:** The power-control button will not function until 20 seconds after the server has been connected to ac power.	1. Make sure that the front-panel assembly power-control button is working correctly: a. Disconnect the server power cords. b. Reconnect the power cords. c. Press the power-control button. 2. Make sure that: • The power cords are correctly connected to the server and to a working electrical outlet. • The server contains the correct type of DIMMs. • The DIMMs are correctly seated. • The LEDs on the power supply do not indicate a problem. • The microprocessor is correctly installed. 3. Reseat the following components: a. DIMMs b. Power supply cables to all internal components c. Power supplies (hot-swap models) 4. Replace the following components one at a time, in the order shown, restarting the server each time: a. DIMMs b. Power supplies (hot-swap models) c. (Trained service technician only) Power supply (non-hot swap models) 5. If you just installed an optional device, remove it, and restart the server. If the server now starts, you might have installed more devices than the power supply supports. 6. See "Power-supply LEDs" on page 107. 7. See "Solving undetermined problems" on page 119.
The server does not turn off.	1. Determine whether you are using an Advanced Configuration and Power Interface (ACPI) or a non-ACPI operating system. If you are using a non-ACPI operating system, complete the following steps: a. Press Ctrl+Alt+Delete. b. Turn off the server by holding the power-control button for 5 seconds. c. Restart the server. d. If the server fails POST and the power-control button does not work, disconnect the ac power cord for 20 seconds; then, reconnect the ac power cord and restart the server. 2. (Trained service technician only) If the problem remains or if you are using an ACPI-aware operating system, suspect the system board.
The server unexpectedly shuts down, and the LEDs on the front-panel assembly are not lit.	See "Solving undetermined problems" on page 119.

Serial port problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The number of serial ports that are identified by the operating system is less than the number of installed serial ports.	1. Make sure that: • Each port is assigned a unique address in the Configuration/Setup Utility program and none of the serial ports is disabled. • The serial-port adapter (if one is present) is seated correctly. 2. Reseat the serial-port adapter. 3. Replace the serial-port adapter.
A serial device does not work.	1. Make sure that: • The device is compatible with the server. • The serial port is enabled and is assigned a unique address. • The device is connected to the correct connector (see "Connectors, LEDs, and jumpers" on page 8). 2. Reseat the following components: a. Failing serial device b. Serial cable c. Remote Supervisor Adapter II SlimLine (if one is present) 3. Replace the following components one at a time, in the order shown, restarting the server each time: a. Failing serial device b. Serial cable c. Remote Supervisor Adapter II SlimLine (if one is present) d. (Trained service technician only) System board

Software problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
You suspect a software problem.	1. To determine whether the problem is caused by the Lotus Foundations software, make sure that: • The server has the minimum memory that is needed to use the Lotus Foundations software. For memory requirements, see the information that comes with the software. If you have just installed an adapter or memory, the server might have a memory-address conflict. • The software is designed to operate on the server. This model of server is designed to work only with the Lotus Foundations Appliance as well as Lotus Foundations applications. 2. If you receive any error messages while you use the software, see the information that comes with the Lotus Foundations software for a description of troubleshooting methods and other suggested solutions to the problem. 3. Contact your place of purchase of the software.

Universal Serial Bus (USB) port problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
A USB device does not work.	1. Run the USB diagnostics. 2. Make sure that: • The correct USB device driver is installed. • The operating system supports USB devices. 3. Make sure that the USB configuration options are set correctly in the Configuration/Setup Utility program. (For more information, see Chapter 2 in this guide.) 4. If you are using a USB hub, disconnect the USB device from the hub and connect it directly to the server.

LCD display and control panel 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, Lotus Foundations Appliance Type 9234," on page 19 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 display does not appear to have power.	1. (Trained service technician only) Reseat the cable connecting the display to the system board. 2. (Trained service technician only) Replace the LCD display.

SATA interposer card and IDE PATA flash module 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, Lotus Foundations Appliance Type 9234," on page 19 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
IDE PATA card returns errors when a disk test is run.	(Trained service technician only) Replace the interposer card and IDE PATA card.
A disk test on the IDE PATA flash module does not return errors, but when the server starts up correctly using an actual hard drive as the primary boot device.	1. (Trained service technician only) Ensure that the IDE PATA card is properly connected to the interposer card and that the interposer card is properly connected to the system board. 2. Additional information on troubleshooting the SATA interposer card and IDE PATA flash module can be found within the following Lotus Foundations Technote articles, available online. • Troubleshooting disk issues • Checking disks for errors - (Trained service technician only) Replace the interposer card and IDE PATA card.

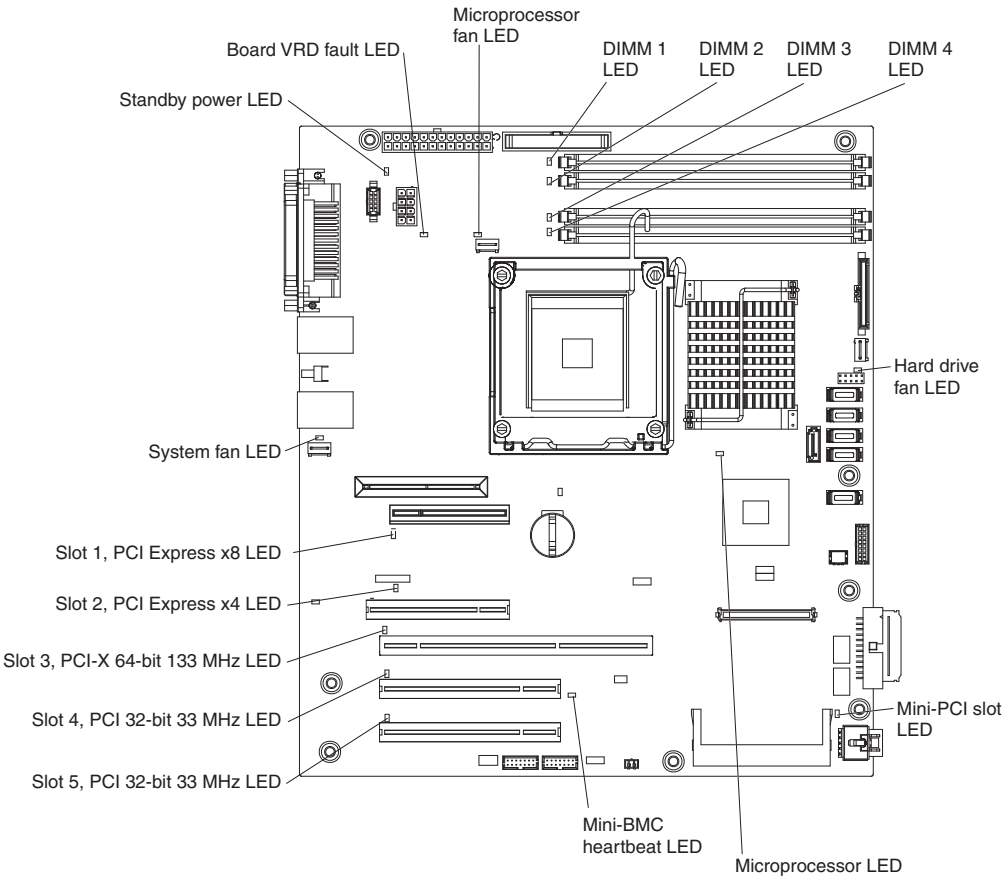
Hotswappable idb drive kit problems

- **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, Lotus Foundations Appliance Type 9234," on page 19 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 idb drive is not detected in WebConfig, although one is inserted and locked into the removable drive cage.	1. (Trained service technician only) Insert another hard drive into the server to see if one is detected. 2. (Trained service technician only) Connect the hard drive directly to the SATA controller card on the system board, bypassing the removable drive cage. 3. Additional information on troubleshooting the hotswappable idb drive can be found within the following Lotus Foundations Technote article: • Troubleshooting disk issues - (Trained service technician only) Replace the removable drive cage.

Error LEDs

The following illustration shows the system-board LEDs. The system board has error LEDs that will help to locate the source of the error. Run the diagnostic programs to find out the cause of the error.



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

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

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

Before you work inside the server to view the LEDs, read the safety information that begins on page vii and “Handling static-sensitive devices” on page 28.

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

1. Check the front-panel assembly on the front of the server. If the system-error LED is lit, it indicates that an error has occurred.

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

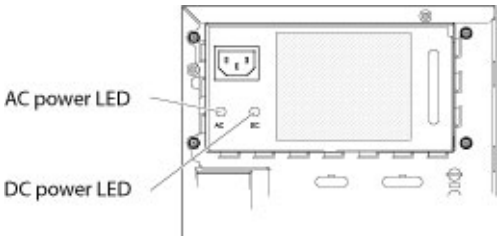
   Look at the system service label on the top of the server, which gives an overview of internal components. This information can often provide enough information to correct the error.

Power-supply LEDs

The following minimum configuration is required for the server to start:

- One microprocessor
- One 512 MB DIMM
- One power supply
- Power backplane
- Power cord
- System board

The following is an illustration of the connectors and power-supply LEDs on the rear of Lotus Foundations Appliance.



The following table describes the problems that are indicated by various combinations of the power-supply LEDs and the power-on LED on the front information panel and suggested actions to correct the detected problems.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Power-supply LEDs		Front information panel power-on LED	Description	Action
AC	DC			
Off	Off	Off	No power to the server, or a problem with the ac power source.	1. Check the ac power to the server. 2. Make sure that the power cord is connected to a functioning power source. 3. Remove one power supply at a time.
Lit	Off	Off	DC source or power supply power problem.	1. Make sure that the power supply is connected to the power backplane. 2. Remove and replace one power supply at a time. 3. View the system-error log (see "Error logs" on page 82).
Lit	Lit	Off	Standby power problem.	1. View the system-error log (see "Error logs" on page 82). 2. Remove one power supply at a time. 3. (Trained service technician only) Replace the power backplane.
Lit	Lit	Flashing	System power-on problem.	1. View the system-error log (see "Error logs" on page 82). 2. Make sure that the power cables are seated correctly. 3. Press the power-control button on the control-panel. 4. Remove the optional Remote Supervisor Adapter II SlimLine, and try to turn on the server. 5. (Trained service technician only) Reseat the system board. 6. (Trained service technician only) Replace the system board.
Lit	Lit	Lit	The power is good.	No action is necessary.

Updating (flash-update) the BIOS code on the server

Periodically, IBM makes new levels of BIOS code available on the Web. Always check http://www.ibm.com/systems/support/ for the latest level of BIOS code, device drivers, documentation, and hints and tips. You can use one of the following methods to update (flash-update) the BIOS code on the server:

- Download the BIOS code update file directly to the hard disk drive.
- Download the BIOS code update file to a diskette (you must attach an optional external USB portable diskette drive to the server); then, update the BIOS code on the server.

One file type is available for each of these methods. The description next to each file indicates the type of medium to which you can download the file. A readme file is also available with instructions for installing the BIOS code update.

To download the BIOS (flash) update files, complete the following steps.

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

1. Go to http://www.ibm.com/systems/support/
2. Click the *System x* link.
3. In the search *Product family* drop down box, select *Lotus Foundations Appliance*.
4. Use the corresponding readme file for detailed instructions, pertaining to the version of the BIOS you are installing.
5. Verify the hardware type in-use. Search via the indicated Foundations Knowledge Base link(s) for more detailed information.

System-error log messages

A system-error log is generated by both the Remote Supervisor Adapter II SlimLine and the mini-BMC. The system-error log can contain messages of three types:

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

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

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

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

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

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

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

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

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

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
ASM Reset -- reason unknown	Information only.
ASM Reset due to *x*, Instruction Fault: *y*	Information only.
ASM Reset due Watchdog timeout	Information only.
ASM Reset was caused by restoring default values	Information only.
ASM Reset was initiated by the user	Information only.
Configuration error recovery on the Inter-connect network	Information only.
CPU over temperature	1. Make sure that the fan sink has good airflow and is not obstructed. 2. Reseat the following components: a. Fan-sink cable b. (Trained service technician only) Fan sink
DASD controller removal	1. Make sure that the mini-PCI-X adapter cable is not damaged. 2. Reseat the mini-PCI-X adapter cable. 3. Replace the mini-PCI-X adapter cable.
DHCP failure,no IP@ assigned-RETRYING!,rc=*xxx*,count=*yyy*	Information only.
Dialback failed for userid *w*. Could not connect at phone number *x*, *y*, *z*	Information only.
ENET[*eee*] DHCP-HstNme=*a*,DN=*b*,IP@=*ccc.ccc.ccc.ccc* GW@=*ddd.ddd.ddd.ddd*, NMsk=*fff.fff.fff.fff*, DNS1@=*ggg.ggg.ggg.ggg*, DNS2@=*hhh.hhh.hhh.hhh*	Information only.
ENET[*eee*] IP-Cfg:HstName=*x*, IP@=*ccc.ccc.ccc.ccc*, GW@=*ddd.ddd.ddd.ddd*, NetMsk=*fff.fff.fff.fff*	Information only.
Failure reading an I2C device, possible bus failure	1. Reseat the following components: a. AC power cords b. Hot-swap power supplies, if any are installed c. Power-supply cables on the system board 2. (Trained service technician only) Replace the system board.
Fan *x* Failure	1. Make sure that fan *x* is not obstructed. 2. Reseat the fan *x* cable. 3. Replace fan *x*.
Fan *x* Outside Recommended Speed	1. Make sure that fan *x* is not obstructed. 2. Reseat the fan *x* cable. 3. Replace fan *x*.

- **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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
Flash of *x* by *y* via *z* was successful.*w*	Information only.
Flash of *x* via *z* failed for user *z...z*	Information only.
Flash succeeded for *x* (address: *y*)	Information only.
Hard Drive *x* Fault	1. Run the diagnostic programs. 2. Replace hard disk drive *x*. 3. Replace the following component, depending on the server model: • Hot-swap models: Hard disk drive backplane • Simple-swap models: Hard disk drive *x* cable
Hard drive *x* removal detected.	Reseat the following component, depending on the server model: • Hot-swap and simple-swap models: Hard disk drive *x*
Internal Error CPU Fault	Information only. If the message remains: 1. (Trained service technician only) Reseat the microprocessor. 2. (Trained service technician only) Replace the microprocessor.
Invalid userid or password received. Userid is *w*, *x*, *y*, *z*	Information only.
LAN: Command Mode tamper triggered. Possible break in attempt	Information only.
LAN: Telnet tamper triggered. Possible break in attempt	Information only.
LAN: Web Server tamper delay triggered. Possible break in attempt	Information only.
LAN: Ethernet interface is no longer active	Information only.
LAN: Ethernet interface is now active	Information only.
No ISMP Gateway defined for the interconnect network. RSA *x* is Assuming the Gateway	Information only.
OS Watchdog response disabled by *x*	Information only.
OS Watchdog response enabled by *x*	Information only.
PFA Alert, see preceding error in system error log	Information only. See the preceding entry in the system-error log.
Possible ASM reset occurred -- reason unknown	Information only.
Power off	Information only.
Power on	Information only.
PPP[*xxx*] PPP-Cfg, Local-IP@=*aaa.aaa.aaa.aaa*, Remote-IP@=*bbb.bbb.bbb.bbb* NetMsk=*ccc.ccc.ccc.ccc*, Auth=*ddd*	Information only.
PPP_1:Client Connected at *xxx* bps	Information only.
PPP_1:User requested to abort PPP interface	Information only.

- **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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
Received alert from system *x*; type:*y*, sender's ID:*z*	Information only.
Remote access attempt failed	Information only.
Remote access attempt failed. Invalid userid or password received. Userid is '*x*' from WEB browser at IP@=*yyy.yyy.yyy.yyy*	Information only.
Remote access attempt failed. Invalid userid or password received. Userid is '*x*' from CMD mode client at IP@=*yyy.yyy.yyy.yyy*	Information only.
Remote access attempt failed. Invalid userid or password received. Userid is '*x*' from TELNET client at IP@=*yyy.yyy.yyy.yyy*	Information only.
Remote Login Successful. Login ID:	Information only.
Remote Login Successful. Login ID:'*x*' from CMD mode client at IP@=*yyy.yyy.yyy.yyy*	Information only.
Retried alert accepted from system *x*; type:*y*, sender's ID:*z*	Information only.
Retry count exceeded. Incorrect password entered too many times for userid *w*, *x*, *y*, *z*	Information only.
RS485 broadcast from *x* ignored; more than *y* devices present on the RS485 network	Information only.
RS485 connection to Lotus Foundations Appliance has ended	Information only.
RS485 network overload has cleared; *x* or fewer devices are present on the RS485 network	Information only.
RSA *x* Became the ISMP Gateway	Information only.
Running the backup ASM main application	Information only.
Secondary Device Event[00 *x* UNKNOWN-*y*]	Information only.
Serial tamper delay triggered. Possible serial port break in attempt	Information only.
System board is over recommended temperature	1. Make sure that the fans have good airflow and are not obstructed. 2. (Trained service technician only) Replace the system board.
System board is under recommended temperature	1. Make sure that the fans have good airflow and are not obstructed. 2. (Trained service technician only) Replace the system board.
System Complex Powered Down	Information only.
System error log full	Clear the current logs.

- **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, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
System is over recommended voltage for +3.3V	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System is over recommended voltage for 1.5V CPU	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System is over recommended voltage on VRM	(Trained service technician only) Reseat the microprocessor.
System is under recommended voltage for +3.3V	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System is under recommended voltage for 1.5V CPU	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System is under recommended voltage on VRM	(Trained service technician only) Reseat the microprocessor.
System log 75% full	Clear the current logs.
System log cleared	Information only.
System Memory Error	1. Reseat the DIMMs. 2. Replace the DIMMs.
System over recommended voltage for +12V	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System over recommended voltage on +2.5V	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System over recommended voltage on continuous +5V	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
System shut off due to system board under temperature	1. Make sure that the fans have good airflow and are not obstructed. 2. (Trained service technician only) Replace the system board.
System shutoff due to +12V over voltage	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to +12V under voltage	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to +2.5V over voltage	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to +2.5V under voltage	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to +3.3V over voltage	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to +3.3V under voltage	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to 1.5V CPU over voltage	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to 1.5V CPU under voltage	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
System shutoff due to board over temperature	1. Make sure that all fans have good airflow and are not obstructed. 2. (Trained service technician only) Replace the system board.
System shutoff due to continuous +5V over voltage	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to continuous +5V under voltage	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System shutoff due to CPU over temperature	1. Make sure that the fan sink has good airflow and is not obstructed. 2. Reseat the following components: a. Fan sink cable b. (Trained service technician only) Fan sink
System shutoff due to VRM over voltage	1. (Trained service technician only) Reseat the microprocessor. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. (Trained service technician only) Microprocessor b. (Trained service technician only) System board
System shutoff due to VRM under voltage	1. (Trained service technician only) Reseat the microprocessor. 2. Replace the following components one at a time, in the order shown, restarting the server each time: a. (Trained service technician only) Microprocessor b. (Trained service technician only) System board
System under recommended voltage for +12V	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System under recommended voltage on +2.5V	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.
System under recommended voltage on continuous +5V	1. Reseat the following components: a. Hot-swap power supplies, if any are installed b. Power supply cables on the system board 2. (Trained service technician only) Replace the system board.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Lotus Foundations Appliance Type 9234," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

System-error log message	Action
Windows blue screen has been captured	Information only.

Solving power problems

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

1. Turn off the server and disconnect all ac power cords.
2. Check for loose cables in the power subsystem. Also check for short circuits, for example, if a loose screw is causing a short circuit on a circuit board.
3. Remove the adapters and disconnect the cables and power cords to all internal and external devices until the server is at the minimum configuration that is required for the server to start (see "Solving undetermined problems" on page 119 for the minimum configuration).
4. Reconnect all ac power cords and turn on the server. If the server starts successfully, replace the adapters and devices one at a time until the problem is isolated.

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

Solving Ethernet controller problems

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

Try the following procedures:

- Make sure that the 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 103.

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, use the clear CMOS jumper (JP2) to clear the CMOS memory; see “System-board jumpers” on page 12. If you suspect that the BIOS code is damaged, see “Updating (flash-update) the BIOS code on the server” on page 109.

Check the LEDs on all the power supplies. If the LEDs indicate that the power supplies are working correctly, complete the following steps:

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

The following minimum configuration is required for the server to start:

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

4. Turn on the server. If the problem remains, suspect the following components in the following order:
   a. System board
   b. Memory module
   c. Microprocessor
   d. SAS/SATA controller

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

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

Problem determination tips

Because of the variety of hardware and software combinations that you can encounter, use the following information to assist you in problem determination. If possible, have this information available when you request assistance from IBM:

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

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

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

See Appendix A, “Getting help and technical assistance,” on page 121 for information about calling IBM for service.

Appendix A. Getting help and technical assistance

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

Before you call

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

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

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

Using the documentation

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

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM systems, optional devices, services, and support. To obtain online support for this product go to:

1. Go to http://www-01.ibm.com/software/lotus/support/
2. Under Search Lotus support, enter the search term ″Foundations Hardware″.
3. In the search results, select the document ″Certified and Supported Hardware Types for Lotus Foundations″.

4. Verify the hardware type in-use. Search via the indicated Foundations Knowledge Base link(s) for more detailed information.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with the Lotus Foundations Appliance For information about which products are supported by Support Line in your country or region, see http://www.ibm.com/services/sl/products/.

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

Hardware service and support

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

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

IBM Taiwan product service

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

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

Appendix B. Notices

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Important notes

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

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

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

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

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

Product recycling and disposal

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

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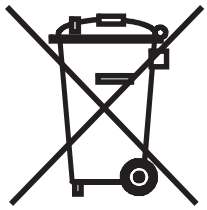


Notice: This mark applies only to countries within the European Union (EU) and Norway.

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

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.

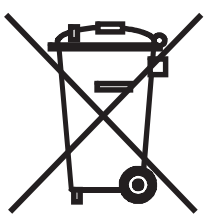
Battery return program

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

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

For Taiwan: Please recycle batteries.

For the European Union:



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Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Les batteries ou emballages pour batteries sont étiquetés conformément aux directives européennes 2006/66/EC, norme relative aux batteries et accumulateurs en usage et aux batteries et accumulateurs usés. Les directives déterminent la marche à suivre en vigueur dans l'Union Européenne pour le retour et le recyclage des batteries et accumulateurs usés. Cette étiquette est appliquée sur diverses batteries pour indiquer que la batterie ne doit pas être mise au rebut mais plutôt récupérée en fin de cycle de vie selon cette norme.

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In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury, and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and treatment of batteries and accumulators. Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local IBM representative.

This notice is provided in accordance with Royal Decree 106/2008 of Spain: The retail price of batteries, accumulators, and power cells includes the cost of the environmental management of their waste.

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.

Electronic emission notices

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are

designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

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

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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

United Kingdom telecommunications safety requirement

Notice to Customers

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

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

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

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這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
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求採取某些適當的對策。

Chinese Class A warning statement

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该产品可能会造成无线电干扰。
在这种情况下，可能需要用户对其
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