



@server

IBM xSeries 336
Type 8837

Option Installation Guide





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Type 8837

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Note:

Before using this information and the product it supports, read the general information in “Notices,” on page 51.

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по
технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

Important:

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

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

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

Statement 1:



DANGER

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

To avoid a shock hazard:

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

To Connect:

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

To Disconnect:

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

Statement 2:



CAUTION:

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

Do not:

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

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

Statement 3:



CAUTION:

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

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

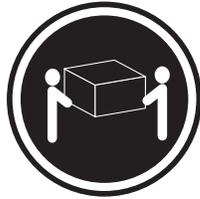


DANGER

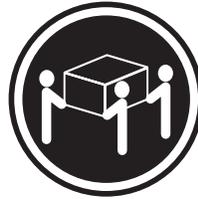
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

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

Statement 4:



≥ 18 kg (39.7 lb.)



≥ 32 kg (70.5 lb.)



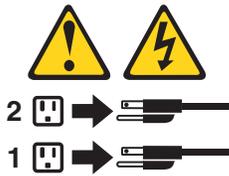
≥ 55 kg (121.2 lb.)

CAUTION:
Use safe practices when lifting.

Statement 5:



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



Statement 6:



CAUTION:
Do not place any objects on top of a rack-mounted device unless that rack-mounted device is intended for use as a shelf.

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.

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

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

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Chapter 1. Introduction

This *Option Installation Guide* contains instructions for installing, removing, and connecting optional devices that your server supports.

Related documentation

In addition to this *Option Installation Guide*, the following documentation comes with the server:

- *User's Guide*

This document is in Portable Document Format (PDF) on the IBM *xSeries® Documentation CD*. It contains general information about the server, including information about features, how to configure the server, and how to get help.

- *Installation Guide*

This printed document contains instructions for setting up the server and basic instructions for installing some options.

- *Safety Information*

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

- *Rack Installation Instructions*

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

- *Hardware Maintenance Manual and Troubleshooting Guide*

This document is in PDF on the IBM *xSeries Documentation CD*. It contains information to help you solve problems yourself, and it contains information for service technicians.

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

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

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

1. Go to <http://www.ibm.com/pc/support/>.
2. In the **Learn** section, click **Online publications**.
3. On the "Online publications" page, in the **Brand** field, select **Servers**.
4. In the **Family field**, select **xSeries 336**.
5. Click **Continue**.

Notices and statements used in this document

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

The following notices and statements are used in this document:

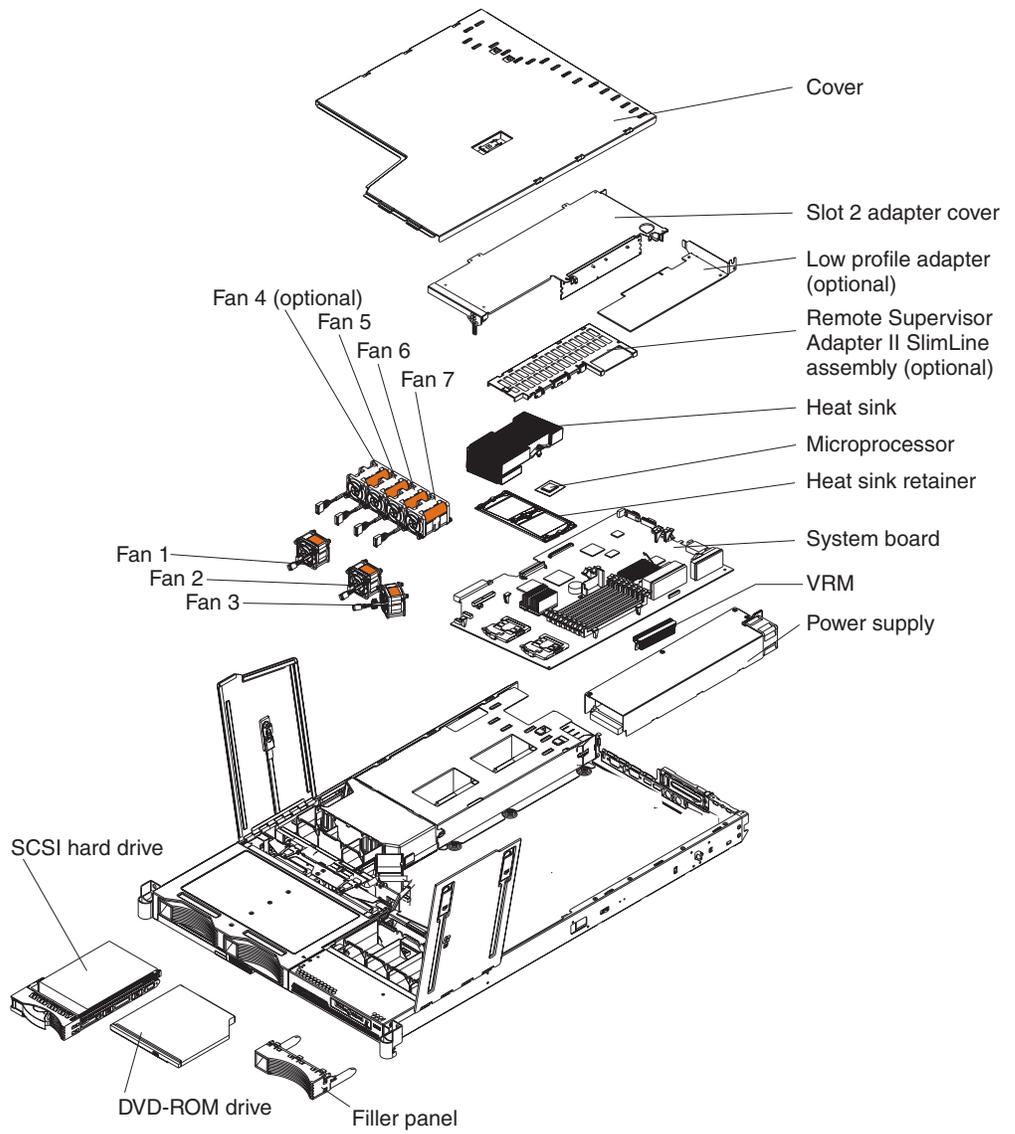
- **Notes:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice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

Major components of the xSeries 336 Type 8837 server

Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the server, open or close a latch, and so on.

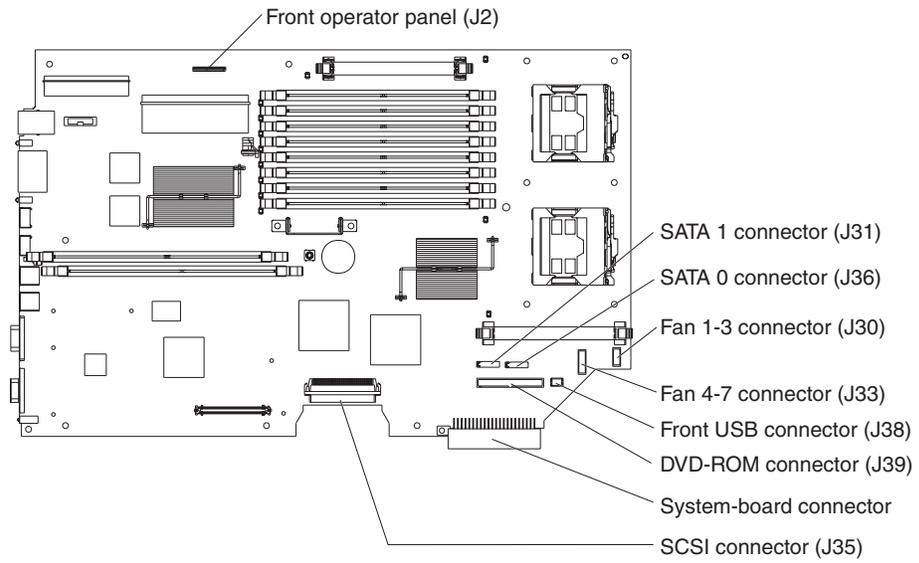
Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points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

The following illustration shows the major components in the server. This illustration shows a SCSI hot-swap hard disk drive model. A SATA non-hot-swap (simple swap) hard disk drive model is also available. The illustrations in this document might differ slightly from the hardware.



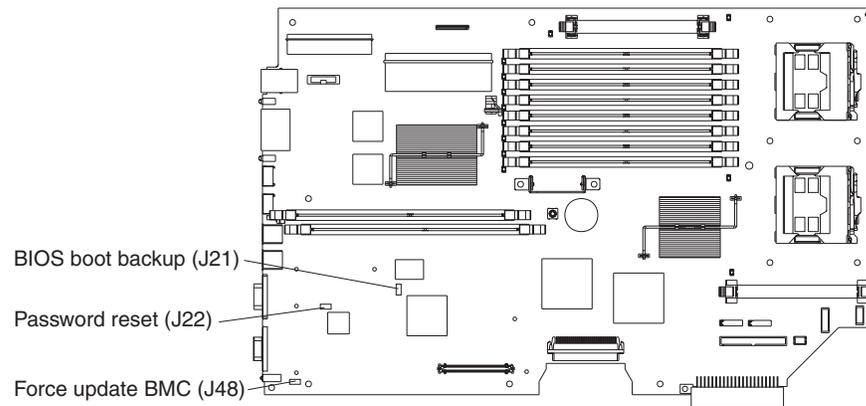
System-board internal cable connectors

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



System-board jumpers

The following illustration shows the jumpers on the system board.

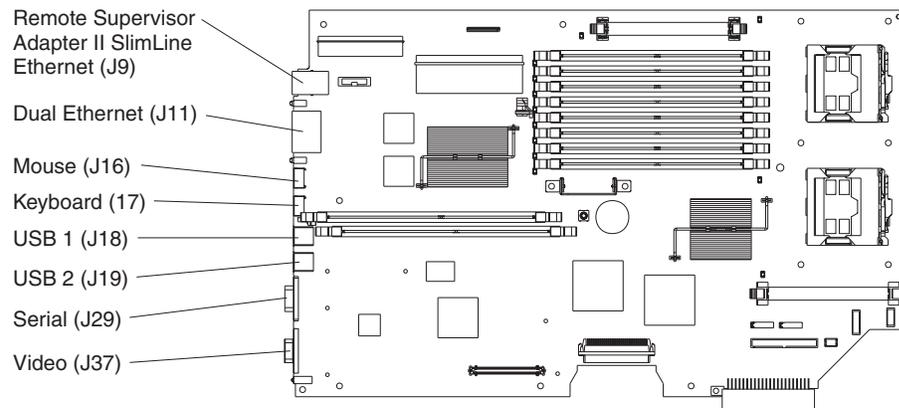


Notes:

1. Before moving any jumpers, turn off the server; then, disconnect all power cords and external cables. (Review the information in “Safety” on page iii, “Installation guidelines” on page 13, “Handling static-sensitive devices” on page 14, and “Turning off the server” on page 15.)
2. Any system-board switch or jumper blocks that are not shown in the illustrations in this document are reserved.

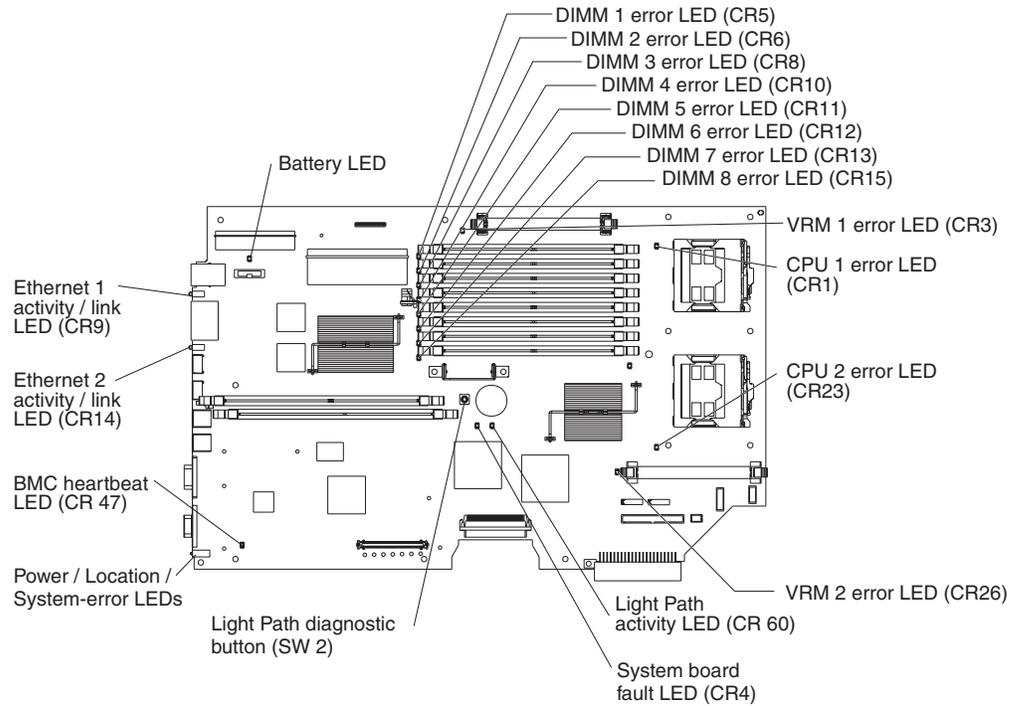
System-board external connectors

The following illustration shows the external input/output connectors on the system board.



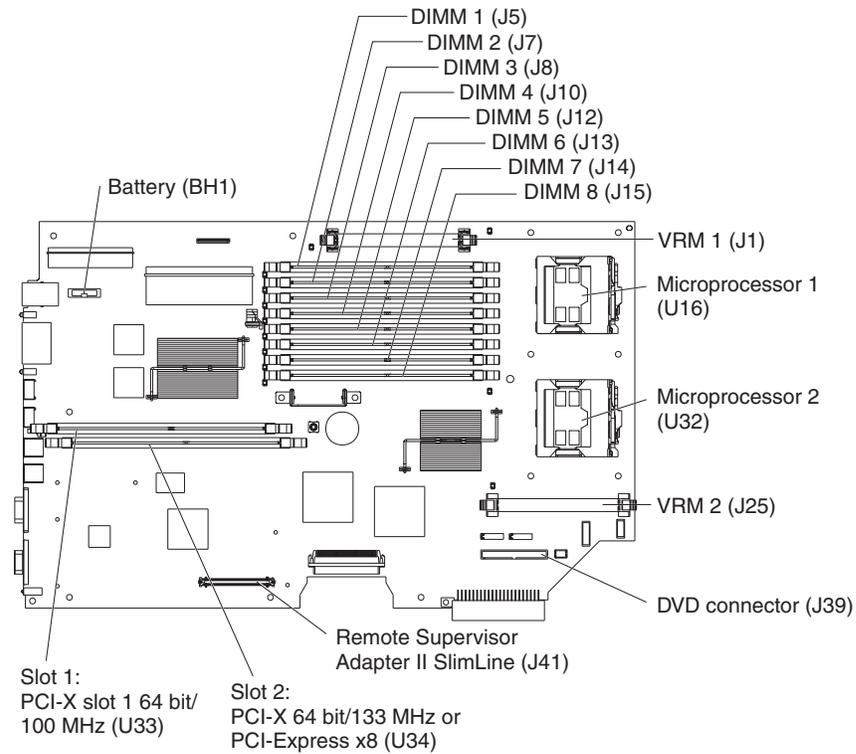
System-board LEDs

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



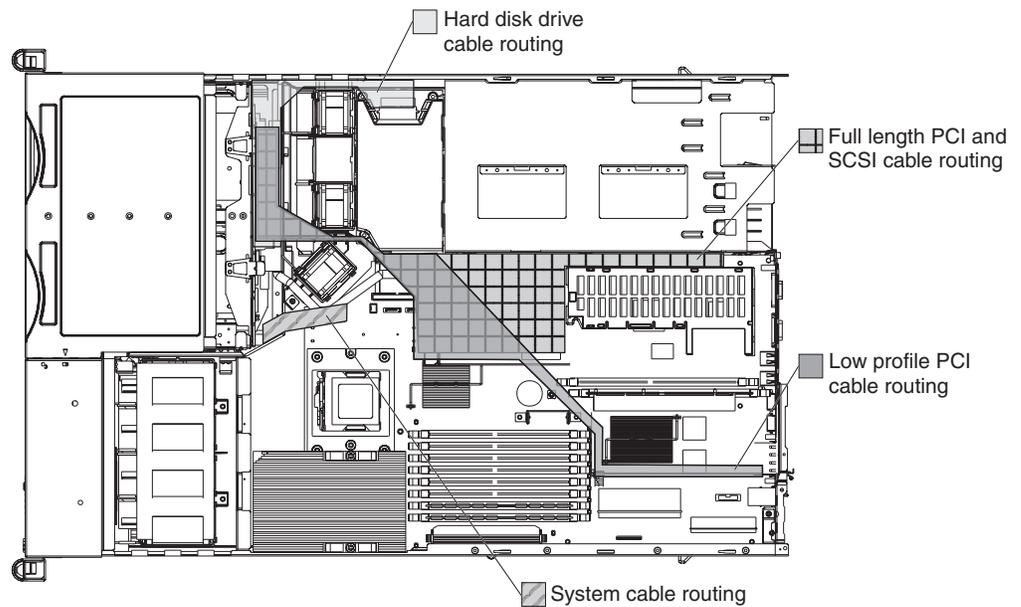
System-board option connectors

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



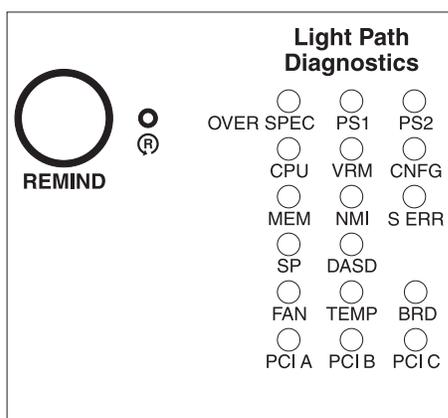
System-board cable channels

The following illustration shows the cable channels on the system board where you should route the cables from user-installable options.



Light Path diagnostics panel

The following illustration shows the controls and LEDs on the Light Path diagnostics panel.



Use the Light Path diagnostics panel to diagnose system errors. The Light Path diagnostics panel is on the top of the operator information panel. To access the Light Path diagnostics panel, press the release latch to the left, on the front of the operator information panel; then, slide out the operator information panel.

For more information about Light Path diagnostics, see the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM xSeries Documentation CD.

The following table lists the LEDs on the Light Path diagnostics panel, the problems that they indicate, and actions to solve the problems. The actions in the table refer to two different error logs; the event error log and the POST error log.

- If a Remote Supervisor Adapter II SlimLine option is installed in the server, use the system event error log.
- If a Remote Supervisor Adapter II SlimLine option is *not* installed in the server, use the POST error log

Note: The Intelligent Platform Management Interface (IPMI) baseboard management controller (BMC) obtains system error information and lights up the appropriate Light Path LED.

The two error logs are in the Configuration/Setup Utility in the Event/Error logs option. For more information, see the *User's Guide*.

LED	Problem	Action
None	An error has occurred and cannot be diagnosed, or the ASM processor has failed. The error is not represented by a Light Path diagnostics LED.	Check the system error log for information about the error.
OVER SPEC	The power supplies are using more power than their maximum rating.	Replace the failing power supply, or remove optional devices from the server.
PS 1	When the LED is lit, the power supply in bay 1 has failed. When the LED flashes, an invalid power-supply configuration has occurred.	If the power supply has failed, call for service. If a configuration error has occurred, make sure that the power supply is installed correctly.

LED	Problem	Action
PS 2	When the LED is lit, the power supply in bay 2 has failed. When the LED flashes, an invalid power-supply configuration has occurred.	If the power supply has failed, call for service. If a configuration error has occurred, make sure that the power supply is installed correctly.
CPU	When the LED is lit, a microprocessor has failed. When the LED flashes, an invalid microprocessor configuration has occurred.	If a lit LED on the system board indicates a problem with a microprocessor, make sure that the microprocessor is installed correctly. See "Installing an additional microprocessor" on page 33 for information about installing a microprocessor. If the problem remains, call for service. If a configuration error has occurred, make sure that the microprocessors have the same cache size and type, and the same clock speed. Microprocessor internal and external clock frequencies must be identical.
VRM	When the LED is lit, an error occurred on the microprocessor voltage regulator module (VRM). When the LED flashes, an invalid VRM configuration has occurred.	Replace the VRM. If the problem remains, call for service. If a configuration error has occurred, make sure that the VRM is installed correctly. If the problem remains, replace the VRM.
CNFG	When the LED flashes, a hardware configuration error has occurred.	Check the system error log for information about the error. The Light Path diagnostic LED for the component that is causing the configuration error also flashes.
MEM	When the LED is on, a memory error has occurred. When the LED flashes, an invalid DIMM configuration has occurred.	Replace the failing DIMM, which is indicated by the lit LED on the system board. If a configuration error has occurred, make sure the DIMMs are installed correctly.
NMI	A machine check error has occurred.	Check the system error log for information about the error.
S ERR	A soft error has occurred.	Check the system error log for information about the error.
SP	The service processor has failed.	Remove ac power from the server; then, reconnect the server to ac power and restart the server. If the problem remains, call for service.
DASD	A hard disk drive error has occurred.	Check the LEDs on the hard disk drives and replace the indicated drive.
FAN	When the LED is lit, a fan has failed or is operating too slowly. A failing fan can also cause the TEMP LED to be lit. When the LED flashes, an invalid fan configuration has occurred.	Replace the failing fan, which is indicated by the lit LED. If a configuration error has occurred, make sure that the fans are installed correctly.
TEMP	The system temperature has exceeded a threshold level.	<ul style="list-style-type: none"> • Determine whether a fan has failed. If it has, replace it. • Make sure that the air vents are not blocked. • Make sure that the room temperature is not too high. See "Features and Specifications" in the <i>Installation Guide</i> or the <i>User's Guide</i> on the IBM xSeries Documentation CD for temperature information. <p>If the problem remains, call for service.</p>
BRD	An error has occurred on the system board or there is a battery fault.	<ul style="list-style-type: none"> • Check the LEDs on the system board to identify the component that is causing the error. • Check the system error log for information about the error. • Check the battery and replace it if it is defective.

LED	Problem	Action
PCI-A	An error has occurred on PCI bus A.	Check the PCI-Express Adapter in slot 2 for an error or there might be a general system board malfunction.
PCI-B	An error has occurred on PCI bus B.	Check the following items for errors: <ul style="list-style-type: none"> • PCI/PCI-X Adapter in Slots 1 or 2. • On-board SCSI. • The system board might have a malfunction.
PCI-C	An error has occurred on PCI bus C.	Check the on-board Ethernet controllers or check for a general system board malfunction.

Chapter 2. Installing options

This chapter provides detailed instructions for installing hardware options in the server.

Installation guidelines

Before you begin installing options, read the following information:

- Read the safety information beginning on page v, “Working inside the server with the power on” on page 14, and “Handling static-sensitive devices” on page 14. This information will help you work safely with the server and options.
- 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.
- You do not have to turn off the server to install or replace hot-swap power supplies or hot-swap fans.
- 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.
- For a list of supported options for the server, go to <http://www.ibm.com/pc/compat/>.

System reliability guidelines

To help make sure that the server has proper cooling and system reliability, make sure that you perform the following actions:

- Each of the drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed in it.
- If the server has redundant power, each of the power-supply bays has a power supply installed in it.
- There is adequate space around the server to allow the server cooling system to work properly. Leave approximately 50 mm (2.0 in.) of open space around the front and rear of the server. Do not place objects in front of the fans. For proper cooling and airflow, replace the server cover before turning on the server. Operating the server for extended periods of time (more than 30 minutes) with the server cover removed might damage server components.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan within 48 hours.
- When replacing a hot-swap fan, you have 5 minutes to install the new fan or the server will shutdown.
- You have replaced a hot-swap drive within 2 minutes of removal.

Working inside the server with the power on

The server supports hot-swap devices and is designed to operate safely while it is turned on and the access doors are open. Follow these guidelines when you work inside a server that is turned on:

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

Handling static-sensitive devices

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

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

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

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 for the BMC 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 is not turned on.

Turning on the server

When you connect the server to ac power, the power supply fans turn on immediately. Pressing the power-control button lets you turn on the server and start the operating system.

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

- If a power failure occurs while the server is turned on, the server will restart automatically when power is restored.
- If your operating system supports the system-management software for the Remote Supervisor Adapter II SlimLine option, the system-management software can turn on the server.
- If your operating system supports the Wake on LAN[®] feature, the Wake on LAN feature can turn on the server.

Turning off the server

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

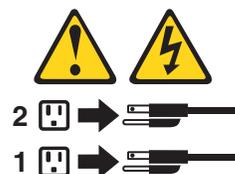
Some operating systems require an orderly shutdown before you turn off the server. See your operating-system documentation for information about shutting down the operating system.

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:

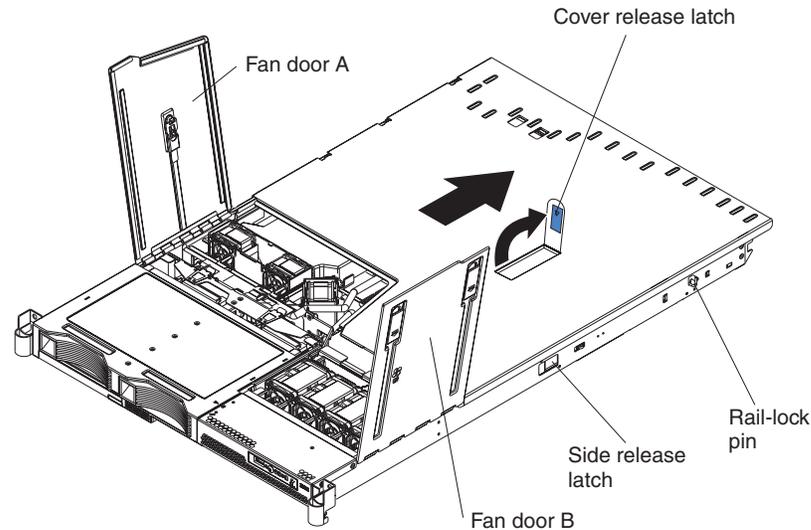
- You can turn off the server from the operating system, if your operating system supports this feature. After an orderly shutdown of the operating system, the server will be turned off automatically.

- 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 you installed the Remote Supervisor Adapter II SlimLine option in the server, the server can be turned off from the Remote Supervisor Adapter II user interface.
- If the Wake on LAN feature turned on the server, the Wake on LAN feature can turn off the server.
- The baseboard management controller can turn off the server as an automatic response to a critical system failure.
- You can turn off the server through a request from the service processor.

Removing the server cover

Complete the following steps to remove the server cover:

Attention: Before removing the server cover, remove the server from the rack and open the two fan doors. See the following illustration.



1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Remove the server from the rack:
 - a. Disconnect the cables and pull the server out of the rack, about a third of the way, until it stops. The cables should be left routed in the cable management arm.
 - b. Slide both side release latches toward the front of the server. Make sure that rail-lock pins are in a vertical position and pull the server out and remove it from the rack.
3. Open both fan doors, fan door A and fan door B. To open fan door A, slide the slide latch to the left, and lift the door panel up. To open fan door B, slide the two slide latches to the right, and lift the door panel up.
4. Remove the server cover:
 - a. Lift up the cover release latch and slide the cover to the rear of the server.
 - b. Make sure that the server cover slides away from the insets that are on the front, rear, and sides of the server cover.
 - c. Lift the cover off the server and set the cover aside.

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

Installing an adapter

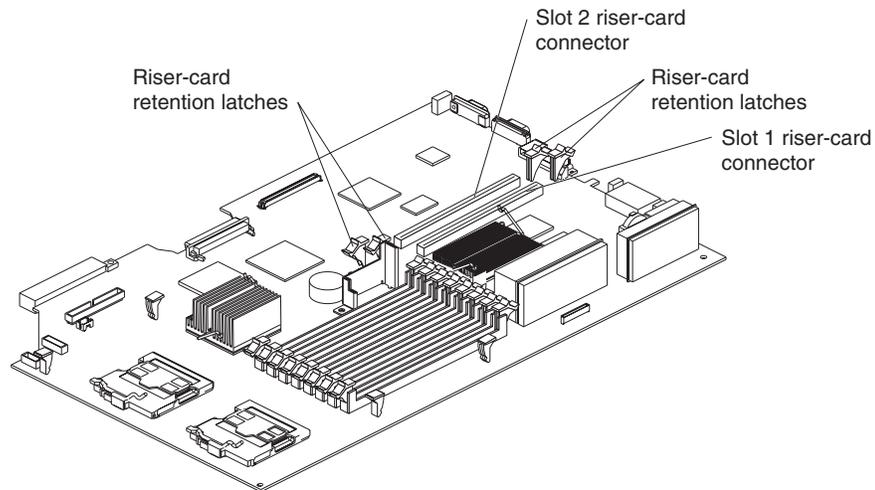
The following notes describe the types of adapters the server supports and other information you must consider when installing an adapter:

- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this section. If you need to change the switch setting or jumper settings on the adapter, follow the instructions that come with the adapter.

- There are several different types of adapters you can install, depending on which slots are available. The following information and illustration identify which types of adapters you can install in PCI slots 1 and 2 and where these slots are located on the system board:
 - Slot 1: You can install only a PCI-X low-profile adapter into slot 1.
 - Slot 2: You can install any PCI-X or PCI-Express adapter into slot 2.

Note: For the PCI-Express adapter, you must install an optional riser card on the system board.

The following illustration shows the location of, and access to, the riser card retention latches for the slot 1 and 2 riser cards.



- When the server starts (boots), it starts the system devices in the following order, if you have not changed the default boot precedence:
 - Integrated Ethernet controllers
 - Integrated SCSI controller
 - PCI-X slot 1
 - PCI-X or PCI-Express slot 2

Complete the following steps to install an adapter:

1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables. Remove the server cover (see “Removing the server cover” on page 17).
3. Follow the cabling instructions, if any come with the adapter. Route the adapter cables before you install the adapter. See “System-board cable channels” on page 9 for cable routing information.
4. Determine which slot you want to use for the adapter, either slot 1 for a low-profile adapter or slot 2 for any type of adapter. See the previous illustration for the locations of slot 1 and slot 2 on the system board.

If you are installing a low-profile adapter, continue with “Installing a low-profile adapter into adapter slot 1” on page 19. If you are installing an adapter in slot 2, go to “Installing an adapter into adapter slot 2” on page 20.

Installing a low-profile adapter into adapter slot 1

Complete the following steps to install the low-profile adapter:

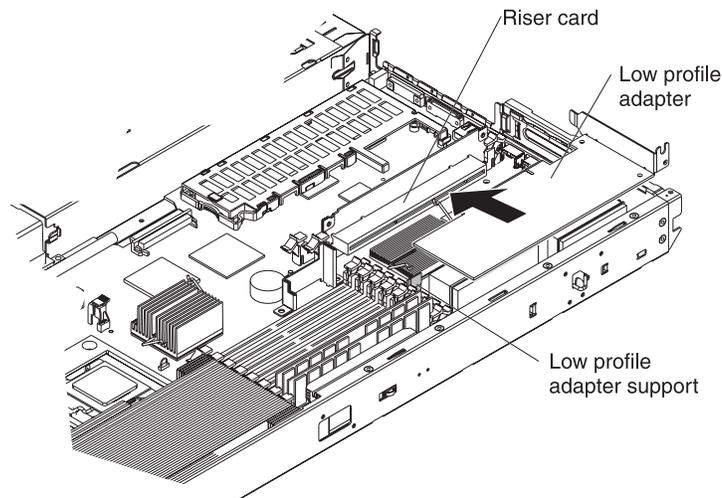
1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Remove the expansion-slot cover from adapter slot 1. From the rear of the server, push the slot 1 expansion cover to the left and then toward the inside of the server. Remove the slot 1 expansion cover and store it in a safe place.

Note: You might have to use a coin or screwdriver to slide the expansion-slot cover to the left.

3. Remove the adapter from the static-protective package and set any jumpers or switches on the adapter as directed by the adapter manufacturer.
4. Slide the I/O connector portion of the adapter through the slot 1 opening.

Attention: When you install an adapter, make sure that the adapter is correctly seated in the connector before you turn on the server. An improperly seated adapter might cause damage to the system board, the riser card, or the adapter.

5. As you start inserting the adapter through the slot 1 opening, align the edge connector, on the low-profile adapter, with the connector on the riser card. Press the edge connector *firmly* into the riser-card connector. Make sure that the adapter snaps into the riser card securely and that the adapter is lying on top of the low-profile adapter support.
6. Push the adapter past the tab, so that the adapter snaps into place on the support.



7. Check the retention latches on the riser card and make sure that they are still securely in place.
8. Connect any internal cables to the adapter. See the instructions that come with the adapter for details.

Attention: Make sure that the cables do not block the flow of air from the fans. For cable routing areas on the system board, see “System-board cable channels” on page 9.

9. If you have other options to install or remove, do so now.
10. Go to “Completing the installation” on page 44.

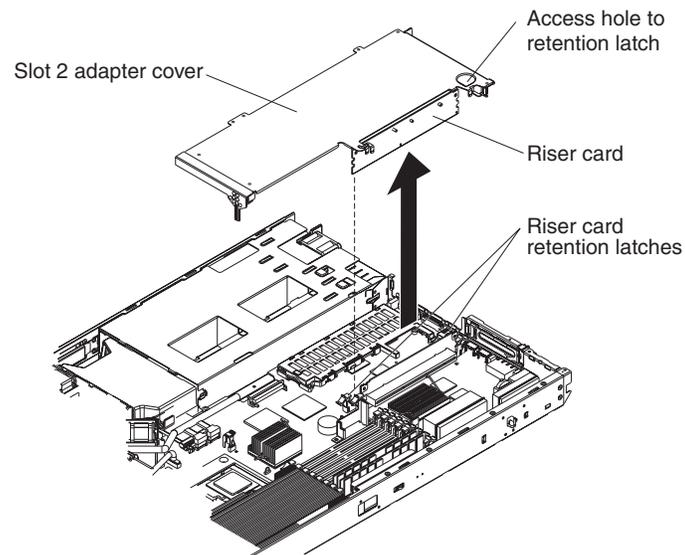
Installing an adapter into adapter slot 2

Complete the following steps to install an adapter into adapter slot 2:

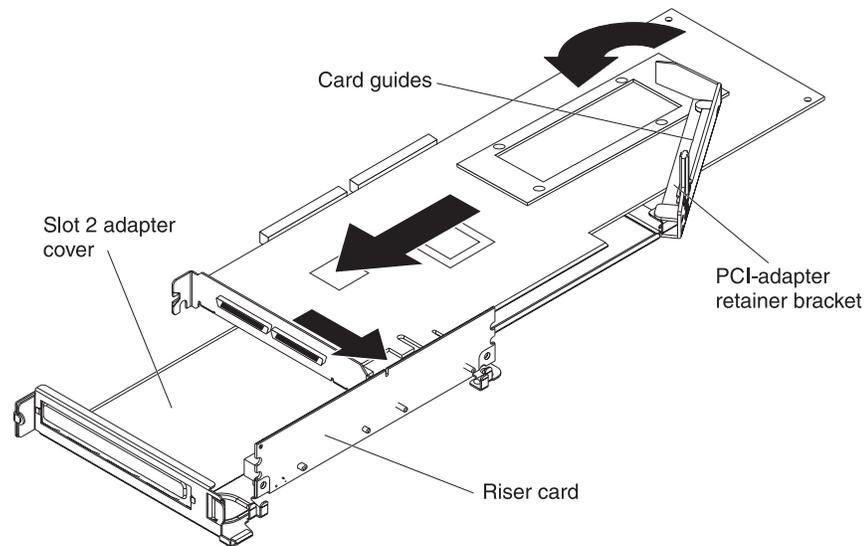
1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Open the retention latches on both sides of the slot 2 riser card. Push the clips down, away from the riser card, until the latches are no longer attached to the riser card.

Note: Insert your finger into the access hole on the slot 2 adapter cover to open the retention latch at the rear of the server.

The following illustration shows the location of the slot 2 riser-card connector and riser-card retention latches.



3. Lift up and remove the slot 2 adapter cover. The slot 2 riser card is attached to the adapter cover, and is removed along with the adapter cover. The following illustration identifies the components that are referred to in this procedure.
4. Remove the expansion-slot cover from the adapter cover:
 - a. Turn the adapter cover so that the expansion-slot cover is facing you.
 - b. Slide the expansion-slot cover to the left. (You might need to use a coin or screwdriver to slide the expansion-slot cover.)
 - c. Push the expansion-slot cover in toward the inside of the adapter cover.
 - d. Remove the expansion slot 2 cover. Store the cover in a safe place.

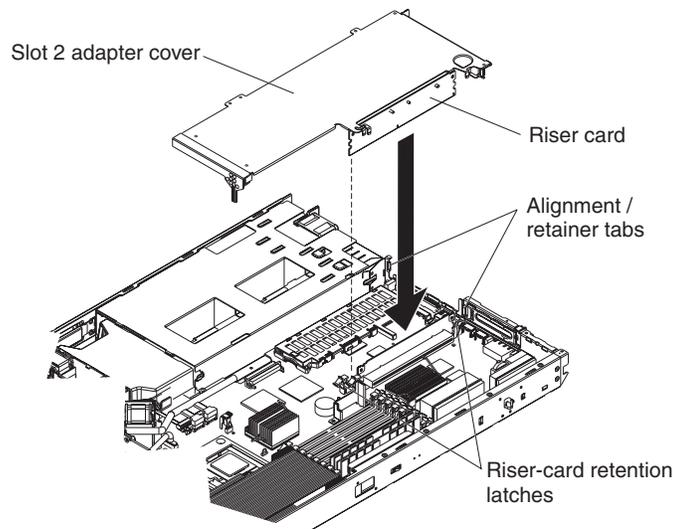


Note: If you are installing a PCI-Express type adapter, you need an optional riser card to plug the adapter into the system board.

5. Prior to installing a full-length adapter, rotate the PCI-adapter retainer bracket 90° away from the adapter cover, to allow insertion of the adapter.
6. Slide the I/O connector portion of the adapter through the connector slot opening.
7. As you insert the adapter through the slot opening, align the adapter edge connector with the riser-card connector and press the adapter *firmly* into the connector. Make sure that the adapter snaps into place and is securely in the riser-card connector.

Attention: When you install an adapter, make sure that you seat the adapter correctly in the riser-card connector before you turn on the server. An improperly seated adapter might cause damage to the system board, the riser card, or the adapter.

8. If you installed a full-length adapter, return the PCI-adapter retainer bracket back to its original position by rotating the PCI-adapter retainer bracket back 90° toward the adapter cover. Place the adapter between the upper and lower guides of the PCI-adapter retainer bracket.
9. Make sure that the PCI-adapter retainer bracket is flush against the adapter cover.



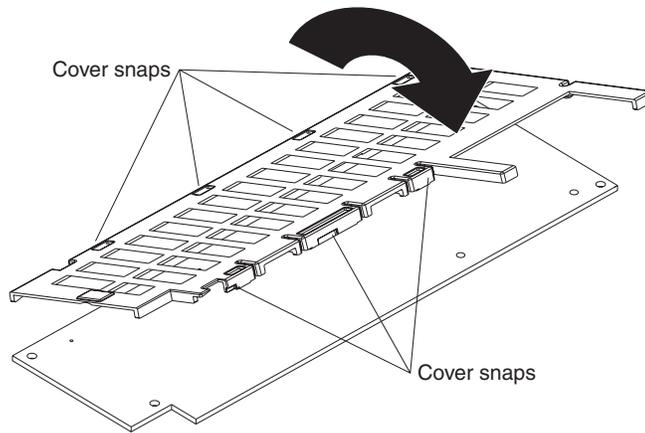
10. Insert the riser card into the riser-card connector on the system board. Grasp the top of the adapter cover and align the riser card with the guides for the riser-card connector. Press the riser card edge connector *firmly* into the slot 2 riser-card connector on the system board.
11. Make sure that the retention latches snap into place to secure the slot 2 riser card into the slot 2 riser-card connector.
12. Connect any internal cables to the adapter. See the instructions that come with the adapter for details.
Attention: Make sure that the cables do not block the flow of air from the fans. See “System-board cable channels” on page 9 for cable routing information.
13. If you have other options to install or remove, do so now.
14. Go to “Completing the installation” on page 44.

Installing the Remote Supervisor Adapter II SlimLine

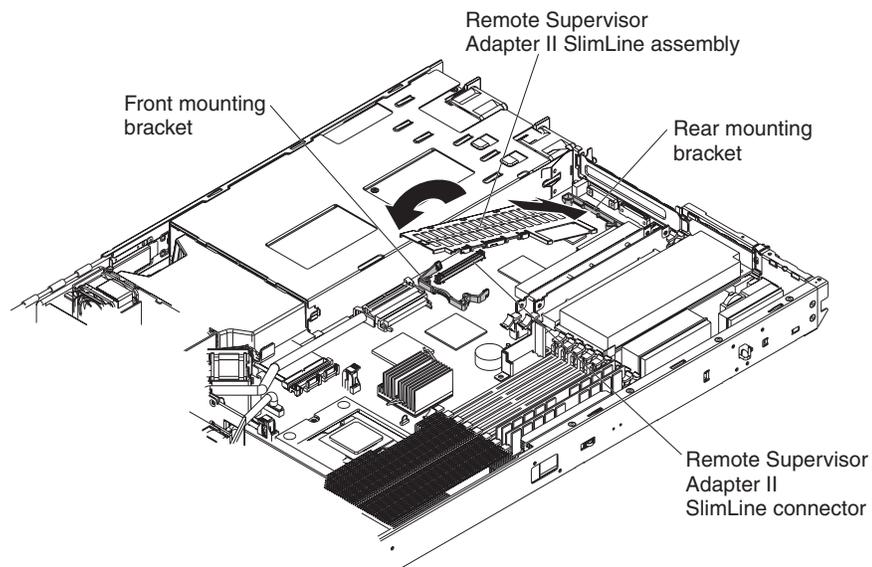
The xSeries 336 server supports the Remote Supervisor Adapter II SlimLine. The Remote Supervisor Adapter II SlimLine does not use a PCI slot in the xSeries 336. The Remote Supervisor Adapter II SlimLine option connects directly to the system board.

Complete the following steps to install the Remote Supervisor Adapter II SlimLine:

1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Remove the slot 2 adapter cover, to allow access to the mounting brackets for the Remote Supervisor Adapter II SlimLine. See “Installing an adapter into adapter slot 2” on page 20 for additional information on removing the slot 2 adapter cover.



3. Install the Remote Supervisor Adapter II SlimLine cover:
 - a. Hook the four cover snaps on the right side of the cover to the adapter (the side closest to the power-supply bay).
 - b. Rotate the adapter toward the cover and hook the left cover snaps to the adapter.



4. The server comes with mounting brackets on the system board. There are front and rear mounting brackets that hold the Remote Supervisor Adapter II SlimLine in place. Align the locating pin on the adapter to the alignment hole on the rear mounting bracket; then, slide the rear of the adapter underneath the flanges of the rear mounting bracket.
5. Push the front of the adapter down onto the front mounting bracket. Push the adapter down, until it snaps into place.
6. If you have other options to install or remove, do so now.
7. Go to “Completing the installation” on page 44.

Installing a hard disk drive

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

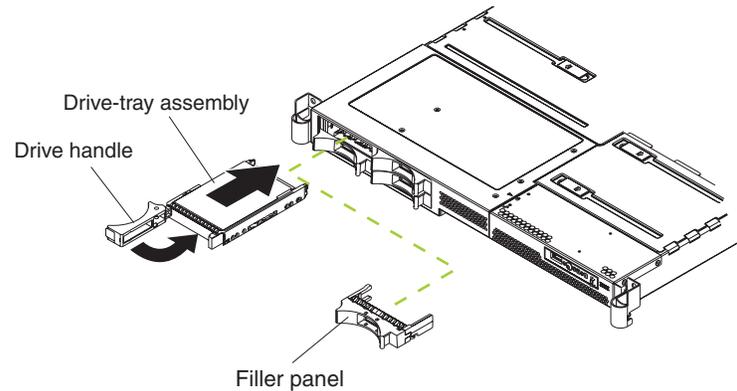
- The server supports the following three configurations:
 - Configuration 1
 - Four 2.5-inch hot-swap SCSI hard disk drives
 - Configuration 2
 - Two 3.5-inch slim hot-swap SCSI hard disk drives
 - One 9.5-mm-high DVD-ROM drive (optional)
 - Configuration 3
 - Two 3.5-inch non-hot-swap (simple swap) Serial ATA (SATA) hard disk drives
 - One 9.5-mm-high DVD-ROM drive (optional)
- Both SCSI configuration models of the server come with a hot-swap SCSI backplane.
- The SCSI server models support low voltage differential (LVD) hot-swap drives. Each hot-swap drive is in a tray, which has a green activity LED and an amber status LED in the upper-right corner. These LEDs are lit if the drive is active and, in some cases, if the drive fails.
- Each hot-swap drive has a single-connector-attached (SCA) connector, which connects directly to the hot-swap SCSI backplane. The backplane attaches to connector J-35 on the system board and controls the SCSI IDs for the hot-swap drives.
- A simple swap hard disk drive does not have a backplane, and it does not have indicator LEDs. Simple swap hard disk drives have a simple swap connection design. The simple swap design has a panel-mount connection at the rear of the hard disk drive cage, which enables the simple swap hard disk drives to easily connect to both the signal and power connections.
- Before you install any type of hard disk drive, read the following information:
 - Inspect the drive tray for signs of damage before inserting the hard disk drive.
 - Read the safety information beginning on page v and “Installation guidelines” on page 13.
- If you are installing a hot-swap drive, continue with “Installing a hot-swap hard disk drive” on page 25. If you are installing a simple swap drive, go to “Installing a simple swap hard disk drive” on page 26.

Installing a hot-swap hard disk drive

If you are installing a 2.5-inch hot-swap drive, continue with “Installing a 2.5-inch hot-swap hard disk drive.” If you are installing a 3.5-inch hot-swap drive, go to “Installing a 3.5-inch hot-swap hard disk drive” on page 26.

Installing a 2.5-inch hot-swap hard disk drive

Complete the following steps to install a 2.5-inch hot-swap SCSI hard disk drive.



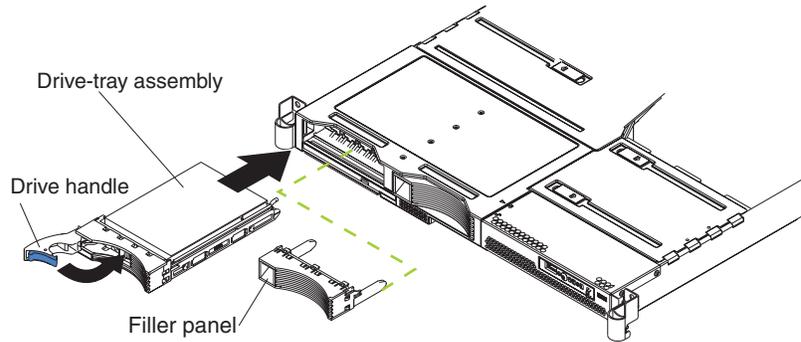
1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Remove the filler panel from the drive bay.

Note: To make sure there is adequate system cooling, do not operate the server for more than 2 minutes without either a hard disk drive or a filler panel installed in each bay.

3. Place the drive handle in the open position and slide the drive into the bay.
4. Close the drive handle.
5. Check the hard disk drive status LED and activity LED to verify that the drive is operating correctly.
6. If you have other options to install or remove, do so now.
7. Go to “Completing the installation” on page 44.

Installing a 3.5-inch hot-swap hard disk drive

Complete the following steps to install a 3.5-inch hot-swap SCSI hard disk drive.



1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Remove the filler panel from the drive bay.

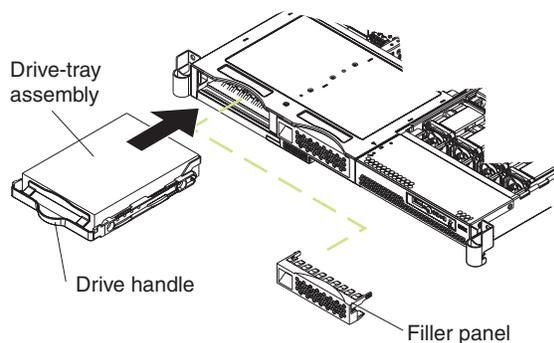
Note: To make sure there is adequate system cooling, do not operate the server for more than 2 minutes without either a hard disk drive or a filler panel installed in each bay.

3. Place the drive handle in the open position and slide the drive into the bay.
4. Close the drive handle.
5. Check the hard disk drive status LED and activity LED to verify that the drive is operating correctly.
6. If you have other options to install or remove, do so now.
7. Go to “Completing the installation” on page 44.

Installing a simple swap hard disk drive

Before you install a simple swap SATA hard disk drive, turn off the server and all attached peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.

Complete the following steps to install a simple swap SATA hard disk drive.



1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Remove the filler panel for the drive from either bay. If you have only one simple swap hard disk drive, you can install it in either the left bay or the right bay.

Note: To make sure there is adequate system cooling, do not operate the server for more than 2 minutes without either a hard disk drive or a filler panel installed in each bay.

3. Insert the simple swap hard disk drive into the drive tray assembly.
4. Slide the drive into the bay until the rear of the drive snaps into place with the rear panel-mount connector. This simple swap connector contains the signal and power connections that are needed by the SATA drive.
5. Install the filler panel for the drive.
6. If you have other options to install or remove, do so now.
7. Go to “Completing the installation” on page 44.

Removing and installing an internal DVD-ROM drive or DVD-ROM blank bezel

The following notes describe the type of DVD-ROM drive the server supports and other information that you must consider when installing a DVD-ROM drive:

- The server supports the installation of an optional DVD-ROM drive only when you are using a 3.5-inch hard disk drive configuration.
- The DVD-ROM drive must be a slim 9.5 mm drive and you install it underneath the 3.5-inch hard disk drive, on the left side.

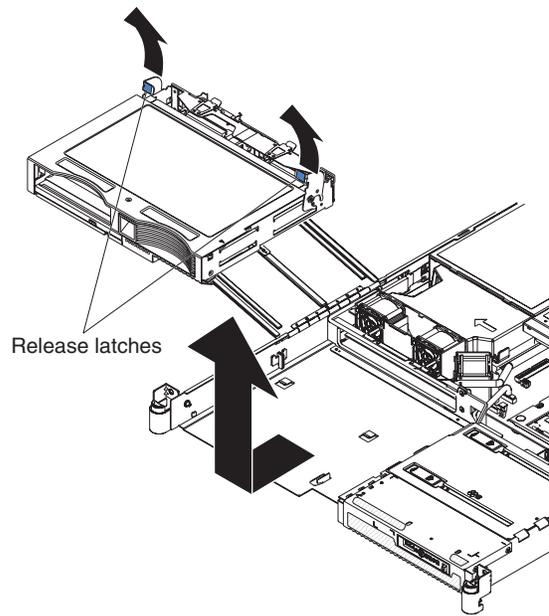
Note: DVD-ROM, CD-ROM, and diskette drives can also be attached externally using the USB connector.

If you are removing an internal DVD-ROM drive or blank bezel, continue with “Removing an internal DVD-ROM drive or DVD-ROM blank bezel” on page 27. If you are installing an internal DVD-ROM drive or blank bezel, go to “Installing an internal DVD-ROM drive or DVD-ROM blank bezel” on page 29.

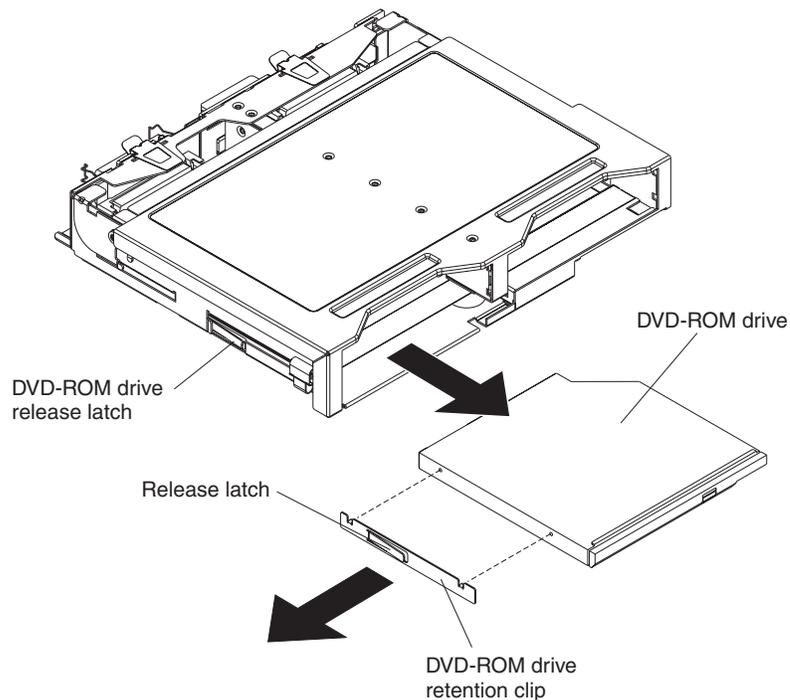
Removing an internal DVD-ROM drive or DVD-ROM blank bezel

Complete the following steps to remove an internal DVD-ROM drive or DVD-ROM blank bezel:

1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables (see “Turning off the server” on page 15); then, remove the cover (see “Removing the server cover” on page 17).



3. Rotate the two release-latches on the 3.5-inch hard drive cage up and then forward to disconnect the electrical connectors and move the drive cage forward; then, lift the 3.5-inch hard drive cage out of the server.
4. Remove the left hard disk drive from the 3.5-inch hard drive cage.

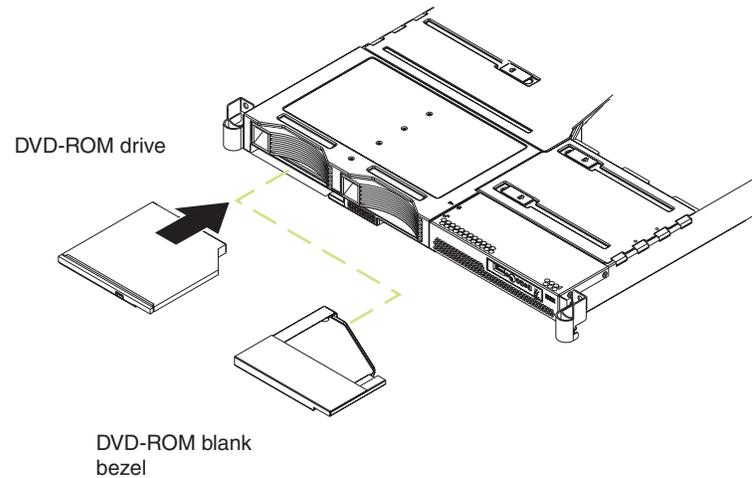


5. Press the release latch on the left side of the DVD-ROM drive or DVD-ROM blank bezel; then, pull the drive or blank bezel and attached retention clip out of the drive cage.
6. Remove the retention clip from the DVD-ROM drive or DVD-ROM blank bezel. This retention clip will be needed when you install a DVD-ROM drive or DVD-ROM blank bezel in the hard drive cage.

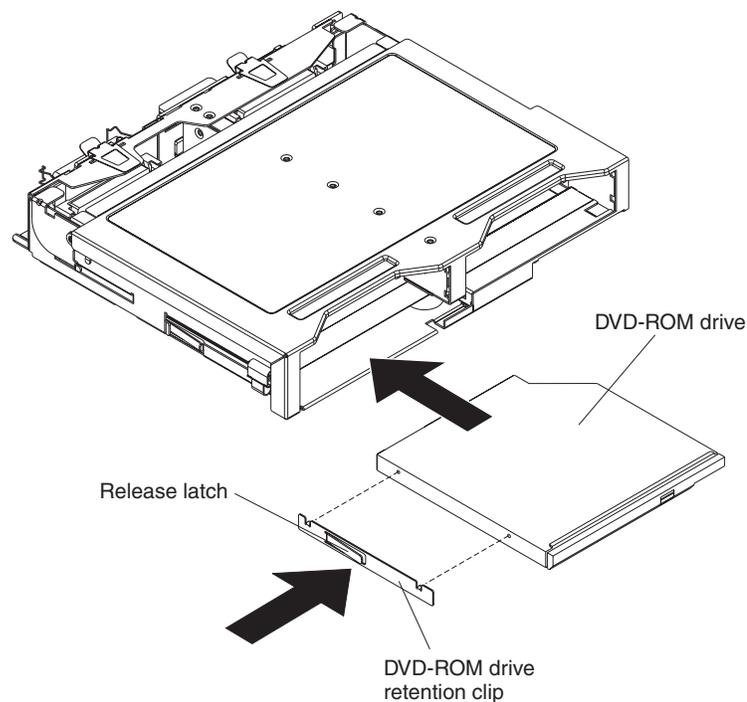
7. Go to “Installing an internal DVD-ROM drive or DVD-ROM blank bezel” on page 29.

Installing an internal DVD-ROM drive or DVD-ROM blank bezel

Complete the following steps to install an internal DVD-ROM drive or DVD-ROM blank bezel.



1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables (see “Turning off the server” on page 15); then, remove the cover (see “Removing the server cover” on page 17).
3. Remove the DVD-ROM drive or DVD-ROM blank bezel. Be sure to follow the instructions in “Removing an internal DVD-ROM drive or DVD-ROM blank bezel” on page 27.

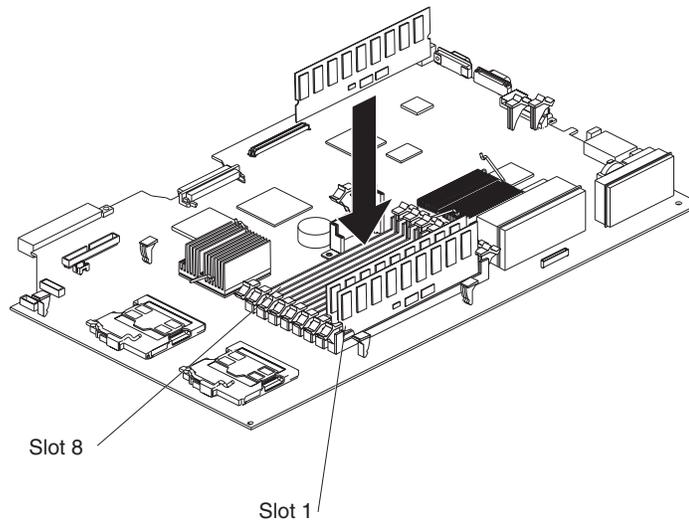


4. Mount the DVD-ROM retention clip on the DVD-ROM drive or DVD-ROM blank bezel that you are installing.
5. Slide the DVD-ROM drive or DVD-ROM blank bezel with the attached mounting bracket into the drive cage, pushing it into the cage until the retention clip engages.
6. If you removed the left hard disk drive from the 3.5-inch hard drive cage, reinstall it. See “Installing a hard disk drive” on page 24 for instructions.
7. Place the 3.5-inch hard drive cage in the server; then, rotate the two release-latches on the 3.5-inch hard drive cage back and then down to slide the drive cage backward and connect its electrical connectors.
8. If you have other options to install or remove, do so now.
9. Go to “Completing the installation” on page 44.

Installing a memory module

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

- The server supports up to eight PC3200 DDR II ECC Registered SDRAM DIMMs. The server supports a minimum of 512 MB and a maximum of 16 GB of installed memory.
- The server uses interleaved DIMMs; you must add, remove, or replace DIMMs in pairs. Each pair must be of the same type, capacity, and speed.
- The server supports 256 MB, 512 MB, 1 GB, and 2 GB DIMMs. See the ServerProven[®] list at <http://www.ibm.com/pc/compat/> for a list of memory modules that the server supports.
- The server comes with one pair of DIMMs installed in DIMM slots 1 and 2 on the system board. The server comes with a minimum of 512 MB (two 256 MB DIMMs).
- You can increase the amount of memory in the server by replacing them with higher-capacity DIMMs or by installing an additional pair of DIMMs into the remaining available slots. The following illustration shows the memory slots on the system board.



Note: When installing additional DIMMs, always install them in pairs starting with slots 1 and 2.

- The server supports Chipkill[™] memory technology, which enables the server to function with one bad chip on a DIMM. The bad memory module must be on a x4 DIMM. The 256 MB and 512 MB x8 DIMMs do not support Chipkill memory. See the following table for the supported Chipkill memory configurations.

Table 1. Supported Chipkill memory configurations

DIMM size	Type	Supported by Chipkill	Minimum	Maximum
256 MB	32Mx8	No	512 MB	2 GB
512 MB	64Mx8	No	1 GB	4 GB
512 MB	64Mx4	Yes	1 GB	4 GB
1 GB	128Mx4	Yes	2 GB	8 GB

Table 1. Supported Chipkill memory configurations (continued)

DIMM size	Type	Supported by Chipkill	Minimum	Maximum
2 GB	256Mx4	Yes	4 GB	16 GB

- You can configure the server to use memory mirroring. Memory mirroring stores data in two pairs of DIMMs simultaneously. When using memory mirroring, you must install two pairs of DIMMs at a time. All the DIMMs you use in memory mirroring must be identical. See the following table for the installation sequence for the DIMM pairs.

Table 2. Memory mirroring DIMM installation sequence

Pair	Slot location
1	Slot: 1 and 2
2	Slot: 3 and 4
3	Slot: 5 and 6
4	Slot: 7 and 8

- The server also supports memory sparing; however, memory sparing and memory mirroring cannot be used at the same time. The sparing feature disables the failed memory from the system configuration and activates a memory sparing pair of DIMMs to replace the failed active DIMM pair.

Before you can enable the memory sparing feature, you must install one additional pair of DIMMs. The memory sparing DIMM pair must be the same speed, type, and the same size as or larger than the active DIMM pair.

To enable memory mirroring or sparing through the Configuration/Setup Utility program, select **Advanced Setup** from the main menu, and select **Memory Configuration**. For more information about using the Configuration/Setup Utility program, see the *Users Guide*. See the following table for memory-sparing DIMM connector assignments.

Table 3. Memory-sparing DIMM connector assignments

Active DIMM connectors	Memory sparing DIMM connectors
Slot 1 and 2	Slot 3 and 4
Slot 1 and 2 Slot 3 and 4	Slot 5 and 6
Slot 1 and 2 Slot 3 and 4 Slot 5 and 6	Slot 7 and 8

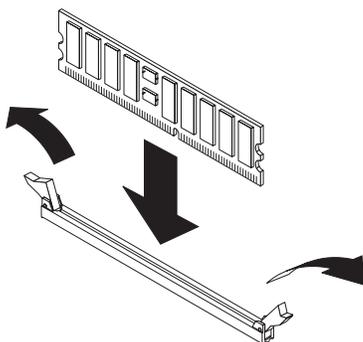
- When you restart the server after adding or removing a DIMM, the server displays a message that the memory configuration has changed.

Complete the following steps to install a DIMM:

- Read the safety information beginning on page v and “Installation guidelines” on page 13.
- Turn off the server and peripheral devices and disconnect all power cords and external cables (see “Turning off the server” on page 15); then, remove the cover (see “Removing the server cover” on page 17).

Attention:

- Avoid touching the components and gold-edge connectors on the DIMMs. Make sure that the DIMMs are completely and correctly seated in the slots. Incomplete insertion might cause damage to the system board or to the DIMMs.
 - When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For information about handling these devices, see “Handling static-sensitive devices” on page 14.
 - To avoid breaking the retaining clips or damaging the DIMM slots, open and close the clips gently. Do not force the DIMM into the slot.
3. Open the retaining clip on each end of the DIMM connector.
 4. Touch the static-protective package containing the DIMM to any unpainted metal surface on the server; then, remove the DIMM from the package.



5. Turn the DIMM so that the DIMM keys align correctly with the slot.
6. Install the DIMM in the slot. 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 inserted; open the retaining clips, remove the DIMM, and then reinsert it.
7. If you have other options to install or remove, do so now.
8. Go to “Completing the installation” on page 44.

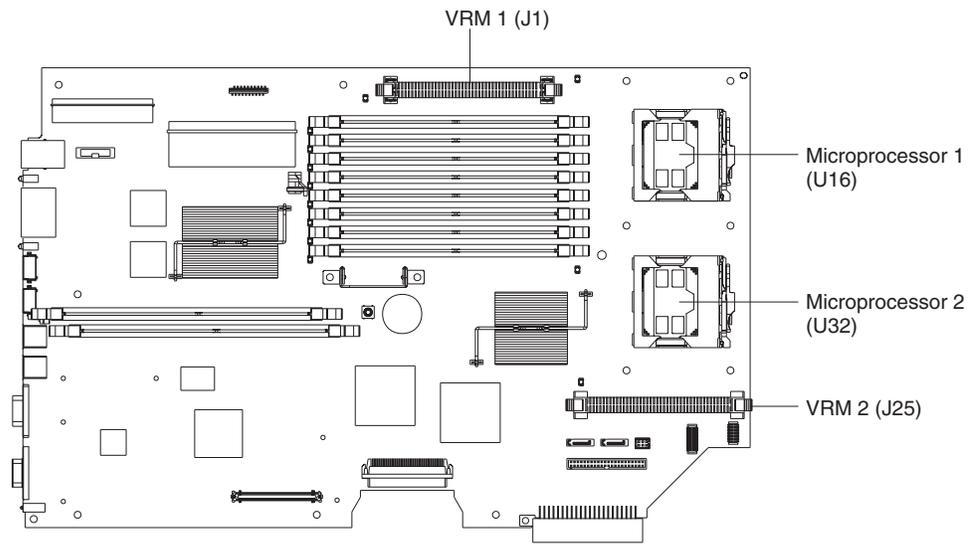
Installing an additional microprocessor

The following notes describe the type of microprocessor that the server supports and other information that you must consider when installing a microprocessor:

- The server supports up to two microprocessors (two-way support); the IBM xSeries 336 server comes with one Xeon microprocessor installed. With two microprocessors, the server can operate as a symmetric multiprocessing (SMP) server.

With SMP, application programs can distribute the processing load between the microprocessors. This enhances performance for database and point-of-sale applications, integrated manufacturing solutions, and other applications.

- The following illustration shows the microprocessor sockets and the voltage regulator module (VRM) slots on the system board.



- If you install a second microprocessor in the server, microprocessor 1 is installed in microprocessor socket 1 (U16), and microprocessor 2 is installed in socket 2 (U32).

You must also install the following items that come with the second microprocessor:

- A voltage regulator module (VRM) that plugs into VRM connector J25
- A cooling fan that plugs into fan position 4

Notes:

1. Read the documentation that comes with the microprocessor to determine whether you must update the basic input/output system (BIOS) code. The most current level of BIOS code for the server is available at <http://www.ibm.com/pc/support/>.
2. A new microprocessor comes in a kit with a VRM, a cooling fan, and a heat sink.
3. To use SMP, obtain an SMP-capable operating system (optional). For a list of supported operating systems, go to <http://www.ibm.com/pc/us/compat/>.

Attention: To avoid damage and to help ensure proper server operation, review the following information before you install a microprocessor:

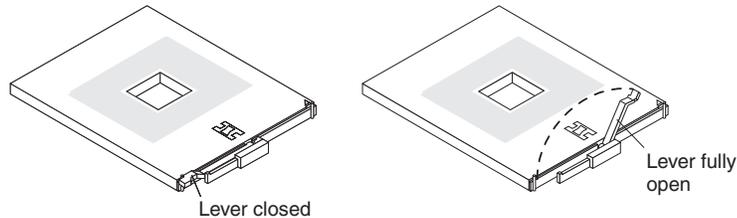
- Make sure that the microprocessors are the same type, have the same cache size, and have the same clock speed.
- Make sure that the microprocessor internal and external clock frequencies are identical.
- See the ServerProven list at <http://www.ibm.com/pc/compat/> for a list of microprocessors that the server supports.

Complete the following steps to install a microprocessor:

1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables.
3. Remove the server cover.

Attention: When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For details about handling these devices, see “Handling static-sensitive devices” on page 14.

4. If you are installing a microprocessor in the microprocessor 2 socket, *first* install a VRM in the microprocessor 2 VRM slot (J-25) and remove the protective cover, if supplied, from the microprocessor 2 socket.
5. Install the microprocessor:
 - a. Touch the static-protective package that contains the new microprocessor to any *unpainted* metal surface on the server; then, remove the microprocessor from the package.

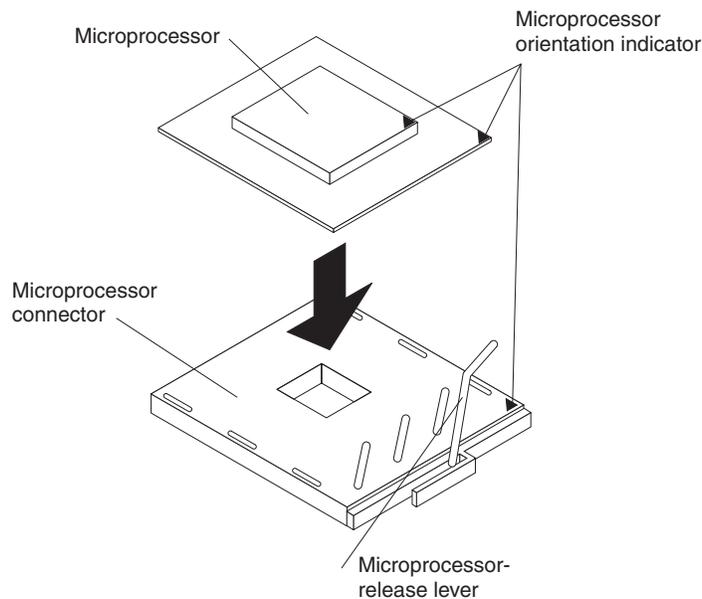


- b. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops or clicks in the fully open position (approximately 135° angle).

Note: The microprocessor-release lever is on the side of the socket that faces the rear of the server.

Attention:

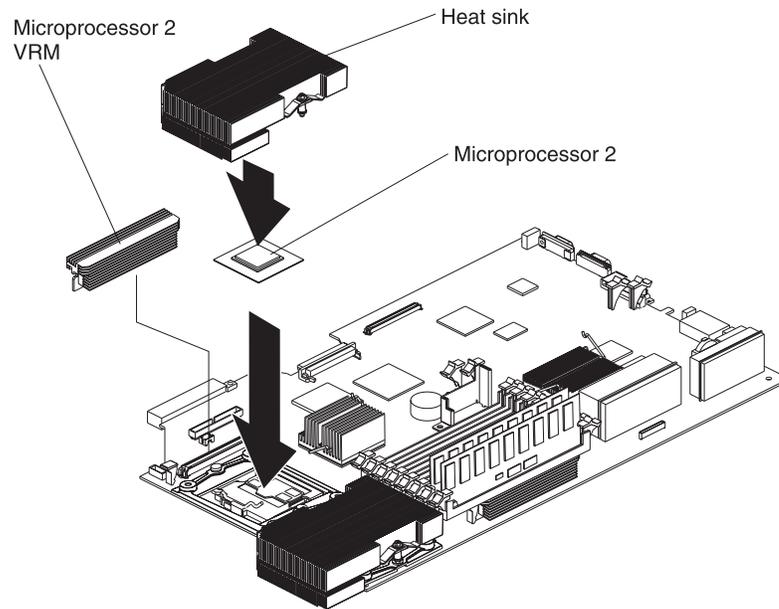
- 1) To avoid bending the pins on the microprocessor, do not use excessive force when pressing it into the socket.
- 2) Make sure the microprocessor is correctly positioned and aligned before closing the microprocessor-release lever.



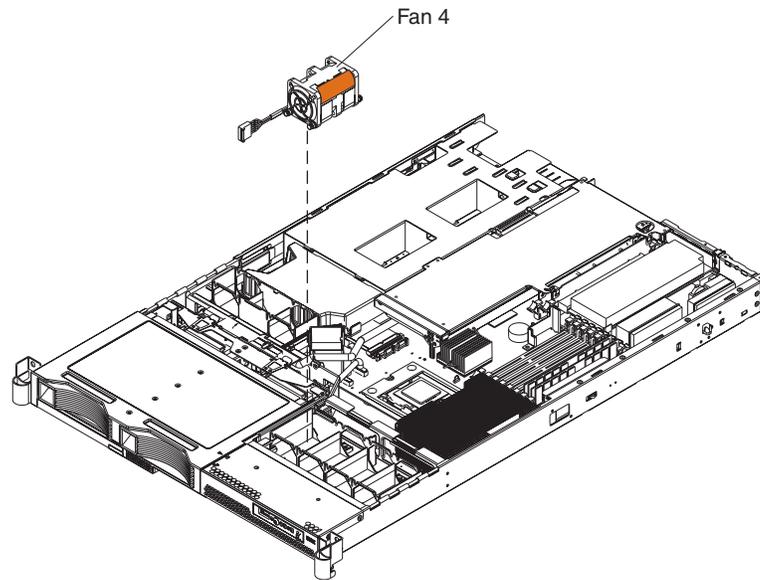
- c. Position the microprocessor over the microprocessor socket; then, carefully press the microprocessor into the socket.
6. Close the microprocessor-release lever to secure the microprocessor.

Attention:

- Do not disturb or contaminate the thermal grease on the bottom of the new heat sink. Doing so damages its heat-conducting capability and exposes the new microprocessor to overheating.
- If you have to remove the heat sink after installing it, note that the thermal grease might have formed a strong bond between the heat sink and the microprocessor. Do not force the heat sink and microprocessor apart; doing so can damage the microprocessor pins. Loosen one captive screw fully before loosening the other captive screw to help break the bond between the components without damaging them.



7. Remove the heat sink from its package and remove the cover from the bottom of the heat sink. Make sure that the thermal grease is still on the bottom of the heat sink and position the heat sink on top of the microprocessor. Press firmly on the captive screws and tighten them, alternating between screws until they are tight. Do not overtighten the screws by using excessive force.



8. Install fan 4, in front of the second microprocessor. See “Replacing a hot-swap fan” on page 41 for instructions.
9. If you have other options to install or remove, do so now.
10. Go to “Completing the installation” on page 44.

Installing and removing a hot-swap power supply

The server supports a maximum of two hot-swap power supplies.

Statement 8



CAUTION:

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

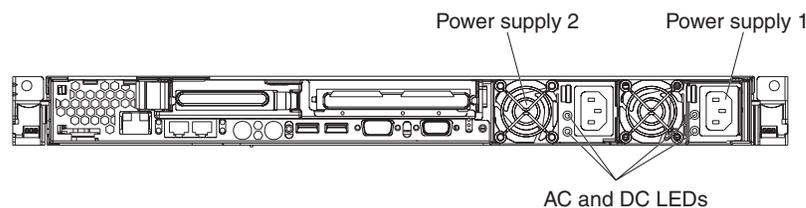


Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

The following notes describe the type of power supply that the server supports and other information that you must consider when installing a power supply:

- The server comes with one 585-watt hot-swap power supply as standard. The input voltage is 110 V ac or 220 V ac auto-sensing.
- You can install an optional 585-watt hot-swap power supply to use as a redundant power supply.
- These power supplies are designed for parallel operation. In the event of a power supply failure, the redundant power supply continues to power the system. Two power supplies are supported per server.
- See “Using Y power-cord connectors for power backup” on page 40 for information on how to properly connect Y power-cord connectors to backup power supplies.

The following illustration shows the power-supply connectors and their associated LEDs on the back of the server. The AC LED is the top LED and the DC LED is the bottom LED.



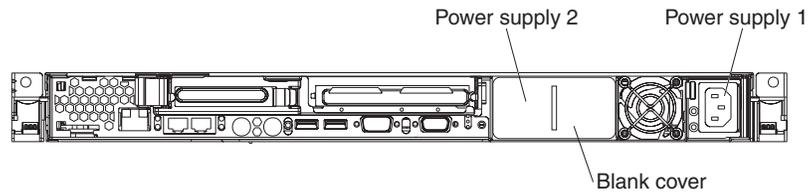
Installing a power supply

Complete the following steps to install a hot-swap power supply:

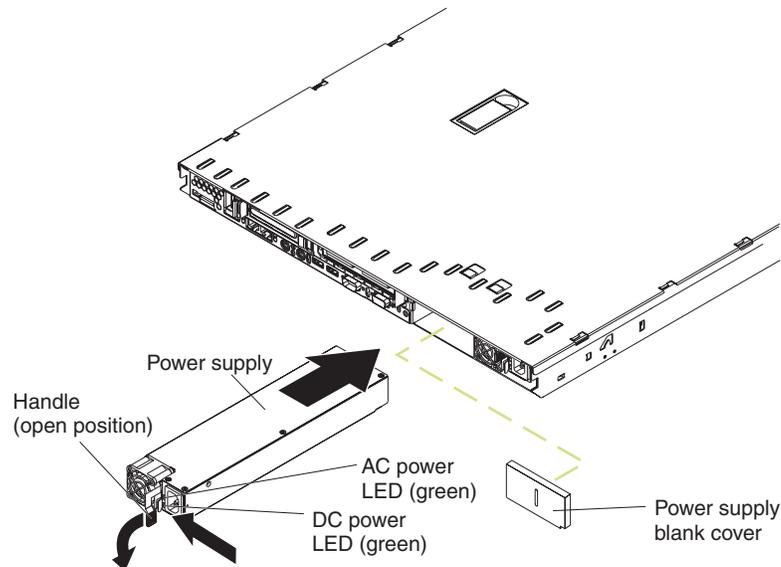
1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Remove the power-supply blank cover from the empty power-supply bay by inserting a coin or flat-tipped screwdriver into the slot in the middle of the power-supply blank. Pull the blank cover from the power-supply bay. Save the power-supply blank cover in a safe place.

Attention: During normal operation, each power-supply bay must have either a power supply or power-supply blank cover installed for proper cooling.

The following illustration shows a power supply in bay 1 and a blank cover in power-supply bay 2.



3. Install the power supply in the empty bay.



- a. Rotate the power-supply handle down to the open position, and then slide the power supply into the power-supply bay.
 - b. Gently lift up the power-supply handle until it clicks into place.
4. Connect the power cord for the new power supply to the power-cord connector on the power supply. If redundant power supplies are installed in the server, see “Using Y power-cord connectors for power backup” on page 40 for additional information.
 5. Connect the power cord to a properly grounded electrical outlet.
 6. Make sure that the power-supply fan starts and the ac power LED (top) and dc power LED (bottom) on the power supply are lit, indicating that the power supply is operating correctly. The two green LEDs are to the left of the power-cord connector.

Removing a power supply

Before you replace an existing power supply, you must remove the old one. Complete the following steps to remove a hot-swap power supply:

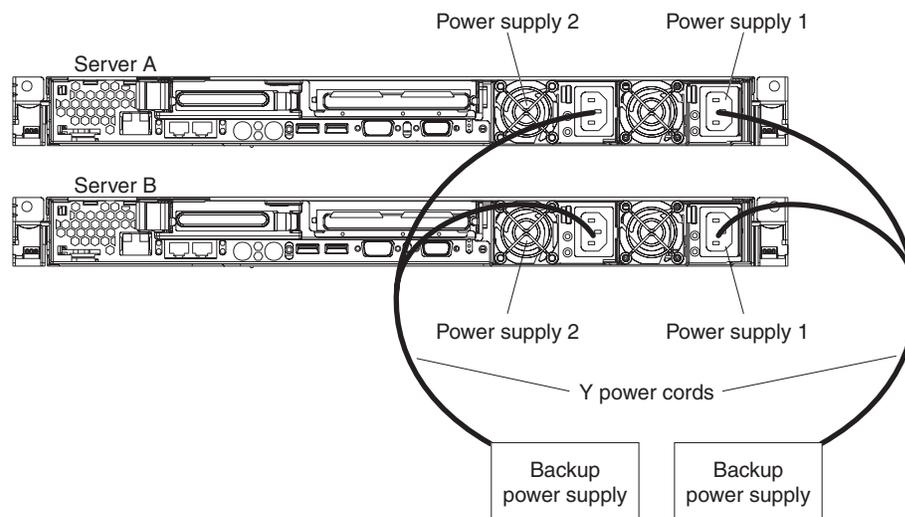
1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Disconnect the power cords:
 - If the server has only one power supply installed in it, turn off the server and peripheral devices; then, disconnect all power cords and external cables (see “Turning off the server” on page 15).
 - If the server has redundant power supplies, disconnect the power cord from the power supply that is being replaced.

3. Push the power-supply handle to the left and then down to release the power supply.
4. Pull the power supply all the way out of the power-supply bay.
5. Install a new power supply by following the instructions in “Installing a power supply” on page 38, or reinstall the blank cover to keep the server from overheating.

Using Y power-cord connectors for power backup

When you have multiple servers with redundant power supplies, use Y power-cords to provide connection to the backup power-supply (Back-UPS) units. The Back-UPS unit provides temporary power to the connected devices if there is a power outage in the network. The Back-UPS unit must be connected correctly to ensure optimum power backup to the servers.

Connect the Y power cord to two power supplies, in two different servers, then connect the other end of the Y power cord to a Back-UPS unit. The following illustration shows the proper connection between the servers with the Y power-cord.



This connection method provides the server with two different and independent backup power sources: one Back-UPS unit for power supply 1 on both servers and another Back-UPS unit for power supply 2 (redundant power supply) on both servers.

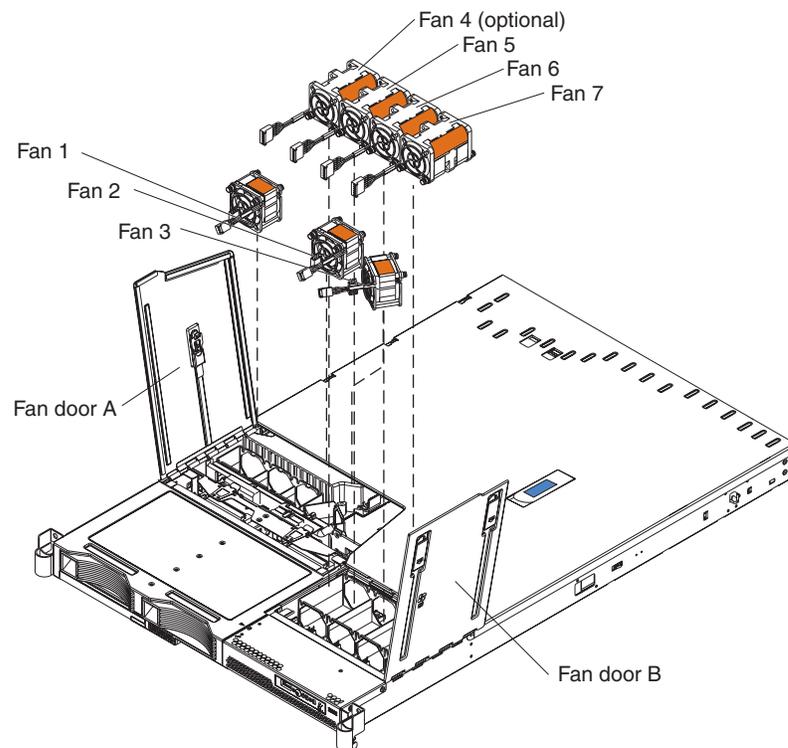
If you have other options to install or remove, do so now. Otherwise, go to “Completing the installation” on page 44.

Replacing a hot-swap fan

The server comes with a maximum of seven hot-swap fans. If the server has one microprocessor, it has six fans. If you install a second microprocessor, the seventh fan, fan 4, comes with the optional second microprocessor.

Attention: To ensure proper server operation, if a fan fails, replace it as soon as possible.

The following illustration shows the locations of the hot-swap fans.



Complete the following steps to replace a hot-swap-fan:

1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Open the fan door for the failing fan. The LED near the connector of the failing fan assembly is lit.
Attention: To ensure proper system cooling, do not leave the fan doors open for more than 30 minutes during this procedure.
3. Disconnect the cable of the failing fan from the connector.
4. Pull up on the orange tab on the side of the failing fan; then, lift the fan out of the server.
5. Orient the new fan in the same position as the fan you removed. Make sure that the airflow indicator, on top of the fan, is pointing to the rear of the server.
6. Push the fan assembly down into the server until the blue grommets are correctly seated.
7. Connect the fan cable to the fan connector.
8. Close the fan door.
9. Go to “Completing the installation” on page 44.

Replacing the battery

The following notes describe information that you must consider when replacing the battery:

- IBM has designed this product with your safety in mind. The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.

Note: In the U. S., call 1-800-IBM-4333 for information about battery disposal.

- If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.
- To order replacement batteries, call 1-800-772-7378 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.

Note: After you replace the battery, you must reconfigure the server and reset the system date and time.

Statement 2:



CAUTION:

When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If the 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.

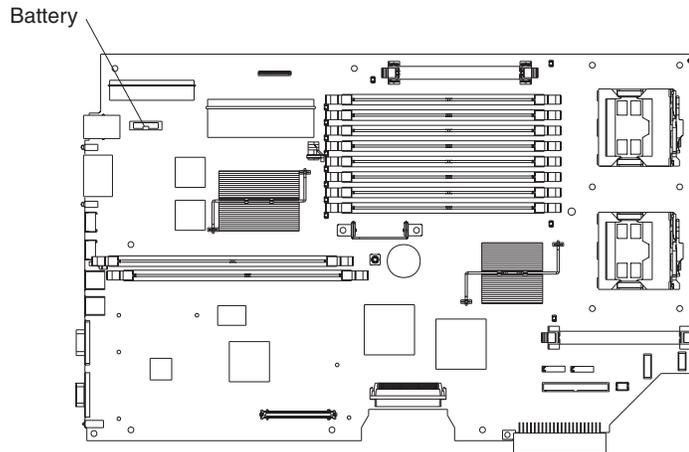
Do not:

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

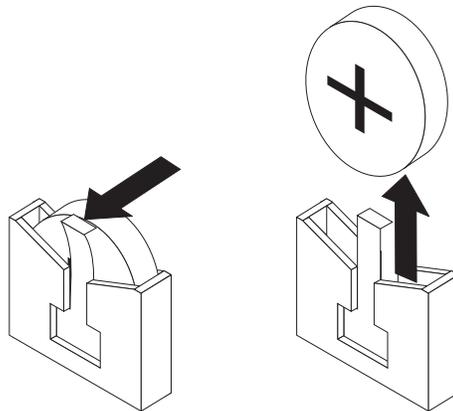
Dispose of the battery as required by local ordinances or regulations.

Complete the following steps to replace the battery:

1. Read the safety information beginning on page v and “Installation guidelines” on page 13.
2. Follow any special handling and installation instructions supplied with the battery.
3. Turn off the server and all attached devices and disconnect all power cords and external cables (see “Turning off the server” on page 15); then, remove the server cover (see “Removing the server cover” on page 17).
4. Disconnect any internal cables, as necessary.



5. Locate the battery (connector BH1) on the system board.



6. Remove the battery:
 - a. Use one finger to pull the retainer tab that secures the battery to its housing.
 - b. Use one finger to slide the battery up and out from its socket.
7. Insert the new battery:
 - a. Hold the battery so that the plus side of the battery is facing toward the center of the server, toward slots 1 and 2.
 - b. Pull the retainer tab out of the way so that you can slide the battery into its socket.
 - c. Slide the battery down until it snaps into place.
8. Reconnect the internal cables that you disconnected.
9. Reinstall the server cover, connect all cables and power cords, and set the required configuration parameters (see “Completing the installation” on page 44).

Completing the installation

Complete the following steps to complete the installation:

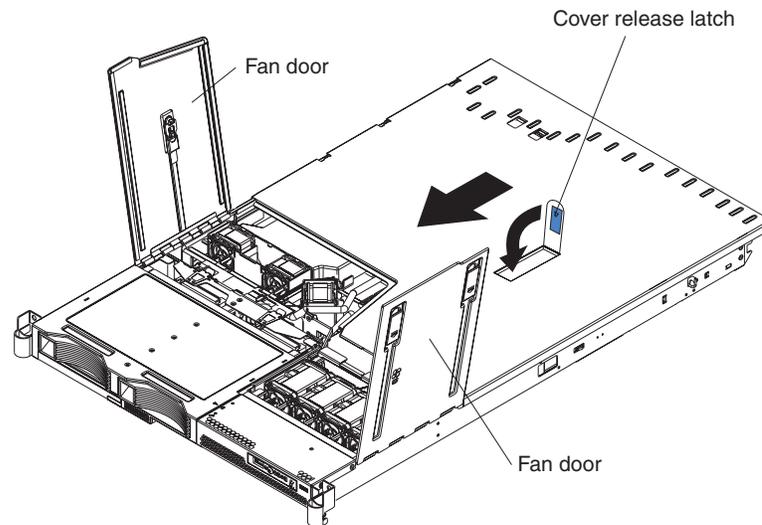
1. Install the server cover. See “Installing the server cover” on page 44 for more information.
2. Connect the cables and power cords. See “Connecting the cables” on page 45 for more information.
3. If you have added or removed hardware from the server, update the server configuration as necessary. See “Updating the server configuration” on page 45 for more information.

Installing the server cover

Complete the following steps to install the server cover:

1. Position the internal cables so that they do not interfere with the cover installation. See “System-board cable channels” on page 9 for information about cable routing.

Important: Before sliding the cover forward, make sure that all the tabs on both the front, rear, and side of the cover engage the chassis correctly. If all the tabs do not engage the chassis correctly, it will be very difficult to remove the cover later.



2. Position the cover on top of the server and slide it forward.
3. Press down on the cover release latch until the cover properly engages all the inset tabs on the server.
4. Close the fan doors.
5. Install the server in the rack. See the *Rack Installation Instructions* that come with the server for details.

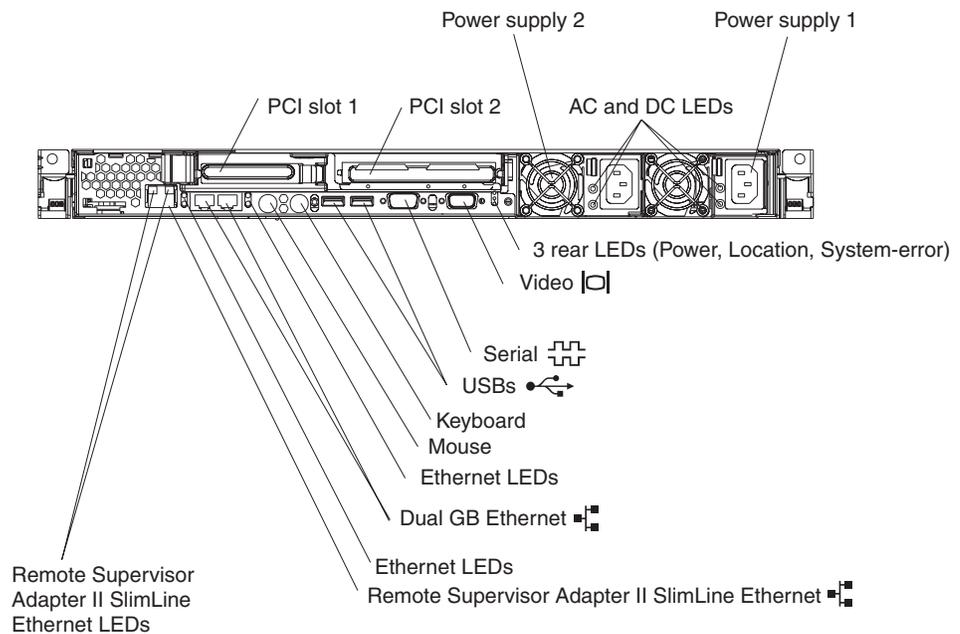
Connecting the cables

The following illustrations show the locations of the input and output connectors on the server. Detailed cabling instructions are in the *Rack Installation Instructions* that come with the server.

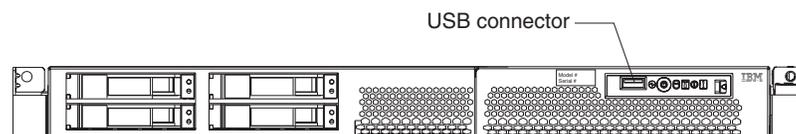
Notes:

1. You must turn off the server before connecting cables to or disconnecting any cables from the server (see “Turning off the server” on page 15).
2. See the documentation that comes with your options for additional cabling instructions. It might be easier for you to route cables before you install certain options.
3. Cable identifiers are printed on the cables that come with the server and options. Use these identifiers to connect the cables to the correct connectors.

Rear view



Front view



Updating the server configuration

After you add or remove an internal option or external SCSI device, you might receive a message that the configuration has changed when you start the server for the first time. The Configuration/Setup Utility program starts automatically so that you can save the new configuration settings. For more information, see the section about configuring the server in the *User's Guide* on the *IBM xSeries Documentation CD*.

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

The server comes with at least one microprocessor. If you install a second one, the server can operate as a symmetric multiprocessing (SMP) server. You might have to upgrade the operating system to support SMP. For more information, see the section about using the *ServerGuide™ Setup and Installation* CD in the *User's Guide* and the operating-system documentation.

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

If you have installed the Remote Supervisor Adapter II SlimLine option to manage the server remotely, see the *Remote Supervisor Adapter II SlimLine User's Guide*, which comes with the adapter, for information about setting up, configuring, and using the adapter.

For information about configuring the integrated Gigabit Ethernet controller, see the *Broadcom NetXtreme Gigabit Ethernet Software* CD.

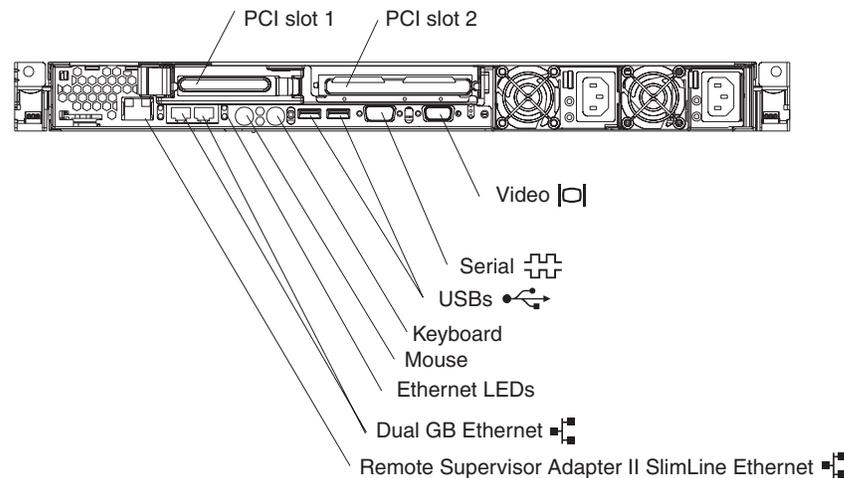
Chapter 3. I/O connectors

Your server has the following input/output (I/O) connectors:

- One auxiliary-device (pointing device) connector
- Three Ethernet controller connectors
- One keyboard
- One serial
- Three Universal Serial Bus (USB), one front and two rear
- One video

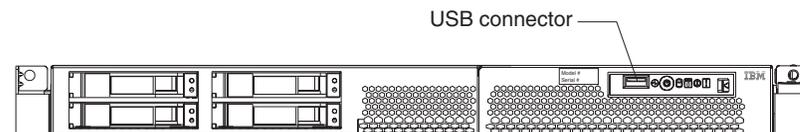
Rear view

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



Front view

The following illustration shows the location of the USB connector on the front of the server.

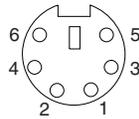


Note: If an optional Remote Supervisor Adapter II SlimLine option is installed on the system board, the server has a dedicated Ethernet connector (Remote Supervisor Adapter II SlimLine Ethernet) on the rear of the server. See the documentation that comes with the Remote Supervisor Adapter II SlimLine for more information.

The following sections describe these connectors.

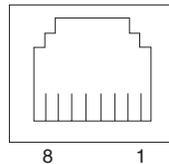
Auxiliary-device (pointing device) connector

Use this connector to connect a mouse or other pointing device. The following illustration shows an auxiliary-device connector.



Ethernet connectors

The following illustration shows an Ethernet connector.



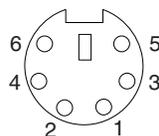
Connect a Category 3, 4, or 5 unshielded twisted-pair cable to this connector. The 100BASE-TX and 1000BASE-T Fast Ethernet standards require Category 5 or higher cabling.

Notes:

1. The server has three Ethernet connectors. Two of the Ethernet connectors are attached to the Ethernet controllers. See the *IBM xSeries 336 Type 8837 User's Guide* on the *IBM xSeries Documentation CD* for more information about the Ethernet controllers.
2. The third Ethernet connector is a dedicated connector that is active only when you install an optional Remote Supervisor Adapter II SlimLine. This dedicated connector is the Remote Supervisor Adapter II SlimLine Ethernet connector.

Keyboard connector

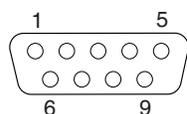
Use this connector to connect a PS/2[®] (non-USB) keyboard to the server. The following illustration shows a keyboard connector.



If you attach a keyboard to this connector, USB ports and devices are disabled during POST.

Serial connector

Use a serial connector to connect a serial device. The following illustration shows a serial connector.

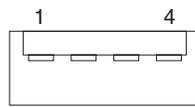


Universal Serial Bus connector

Use a Universal Serial Bus (USB) connector to connect a USB device. The USB ports support both USB 1.0, 1.1 and 2.0. The following table contains the speeds and cable lengths that USB 1.0, 1.1, and 2.0 support.

	USB 1.0/1.1	USB 2.0
Speed	12 Mbps	480 Mbps
Maximum cable length	3.0m (low speed)	3.0m (low speed)
	5.0m (high speed)	5.0m (high speed)

Using Plug and Play technology, USB devices are configured automatically and can interface with a maximum of 127 devices. The following illustration shows a USB connector.



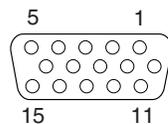
Use a 4-pin cable to connect a device to a USB connector. If you need to connect more USB devices than the server has USB connectors for, use a USB hub to connect additional devices.

If you connect a PS/2 (non-USB) keyboard to the keyboard connector, the USB keyboard port is disabled during POST.

If you connect a USB keyboard that has a mouse port, the keyboard emulates a mouse, and you cannot disable the mouse settings in the Configuration/Setup Utility program.

Video connector

Use this connector to connect a monitor to the server. The connector is dark blue to help you identify it. The following illustration shows a video connector.



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Important notes

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

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

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

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

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

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

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

Product recycling and disposal

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

Battery return program

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

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

In the Netherlands, the following applies.



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

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

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

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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

United Kingdom telecommunications safety requirement

Notice to Customers

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

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

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

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Chinese Class A warning statement

聲 明
此為 A 級產品。在生活環境中，該產品可能會造成無線電干擾。在這種情況下，可能需要用戶對其干擾採取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Power cords

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

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

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

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

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

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

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

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

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