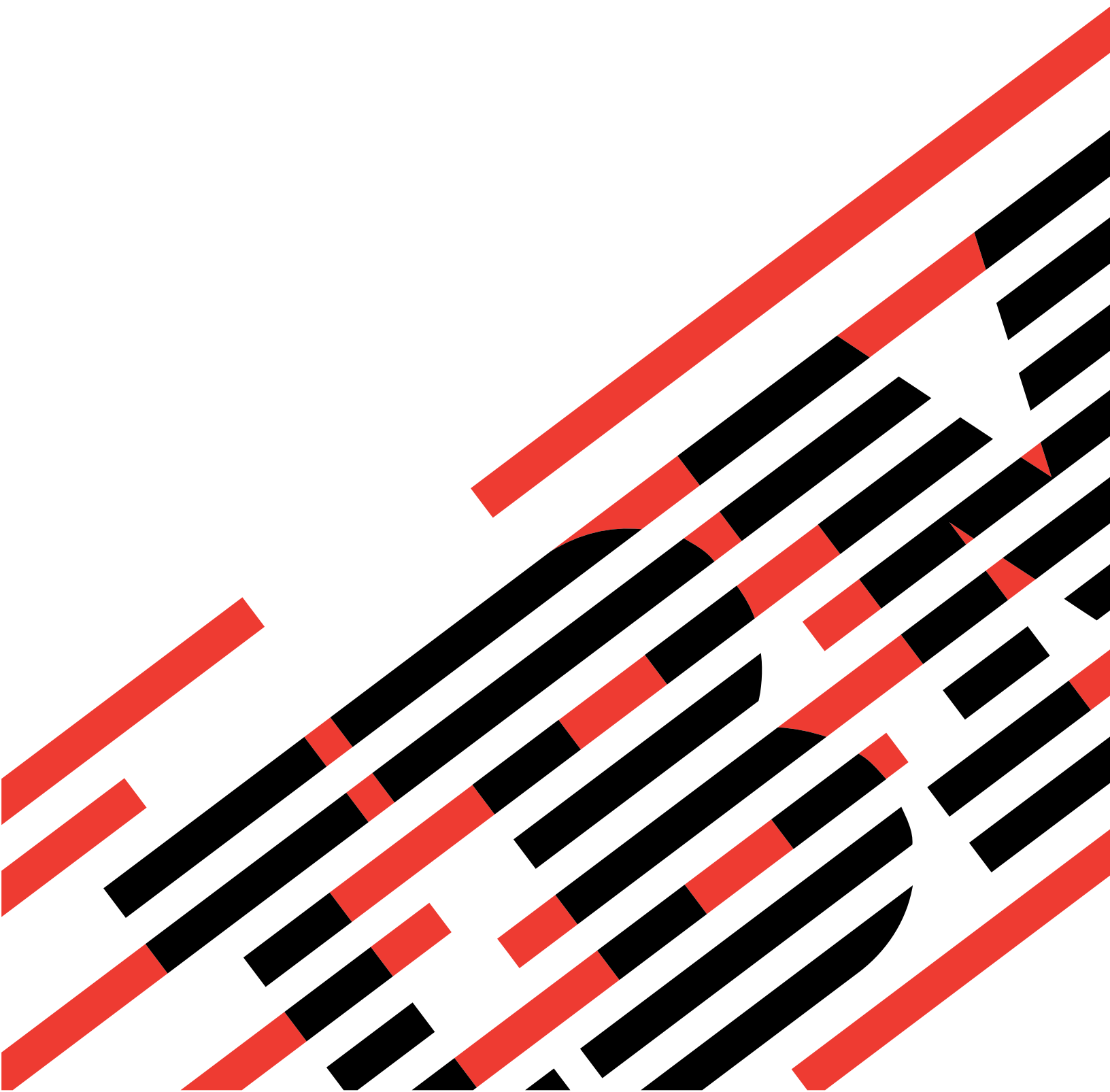




@server

IBM xSeries 365
Type 8861 and 8862
Option Installation Guide





@server

IBM xSeries 365
Type 8861 and 8862
Option Installation Guide

Note:

Before using this information and the product it supports, read the general information in “Notices,” on page 45

First Edition (December 2003)

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Contents

Safety	v
Chapter 1. Introduction	1
Related documents	1
Notices and statements used in this document	2
Major components of the xSeries 365 server	2
Memory-board connectors and LEDs	4
I/O-board connectors, jumpers, and LEDs	6
Microprocessor board connectors and LEDs	8
Light path diagnostics panel	9
Chapter 2. Installing options	11
Installation guidelines	11
System reliability guidelines	11
Working inside the server with the power on	11
Handling static-sensitive devices	12
Removing the cover and bezel	13
Installing a PCI or PCI-X adapter	13
Installing a hot-swap hard disk drive	17
Replacing the CD-ROM drive	18
Installing memory modules	18
Installing a microprocessor	22
Installing a hot-swap power supply	29
Replacing the battery	31
Replacing a hot-swap fan	33
Replacing the memory cassette	34
Completing the installation	35
Installing the cover and bezel	35
Connecting the cables	36
Updating the server configuration	38
Chapter 3. I/O connectors	41
Server connectors	42
Auxiliary-device (pointing device) connector	42
Ethernet connector	42
Keyboard connector	42
RXE Expansion Port connector	42
RXE Management Port connector	43
SCSI connector	43
Serial connector	43
Universal Serial Bus connector	43
Remote Supervisor Adapter II connectors	44
Appendix. Notices	45
Edition notice	45
Trademarks	46
Important notes	46
Product recycling and disposal	47
Battery return program	47
Electronic emission notices	48
Federal Communications Commission (FCC) statement	48
Industry Canada Class A emission compliance statement	48
Australia and New Zealand Class A statement	48

United Kingdom telecommunications safety requirement	48
European Union EMC Directive conformance statement	48
Taiwanese Class A warning statement	49
Chinese Class A warning statement	49
Japanese Voluntary Control Council for Interference (VCCI) statement	49
Power cords	49
Index	53

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

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* document.

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

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

Statement 1:



DANGER

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

To avoid a shock hazard:

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

To Connect:

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

To Disconnect:

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

Statement 2:



CAUTION:

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

Do not:

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

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

Statement 3:



CAUTION:

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

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



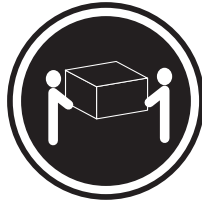
DANGER

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

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

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

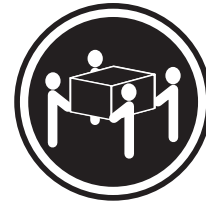
Statement 4:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



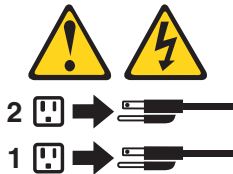
≥ 55 kg (121.2 lb)

CAUTION:
Use safe practices when lifting.

Statement 5:



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



Statement 8:



CAUTION:

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



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

Statement 10:



CAUTION:

Do not place any object weighing more than 82 kg (180 lb) on top of rack-mounted devices.



>82 kg (180 lb)

Chapter 1. Introduction

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

Related documents

The following documentation comes with your server:

- *User's Guide*
This document is in Portable Document Format (PDF) on the IBM® *xSeries Documentation* CD. It contains general information about your server.
- *Installation Guide*
This printed document contains instructions for setting up your 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 your 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 your server model, additional publications might be included on the IBM *xSeries Documentation* CD.

Your 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 your 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 365**.
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 the documentation:

- **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.

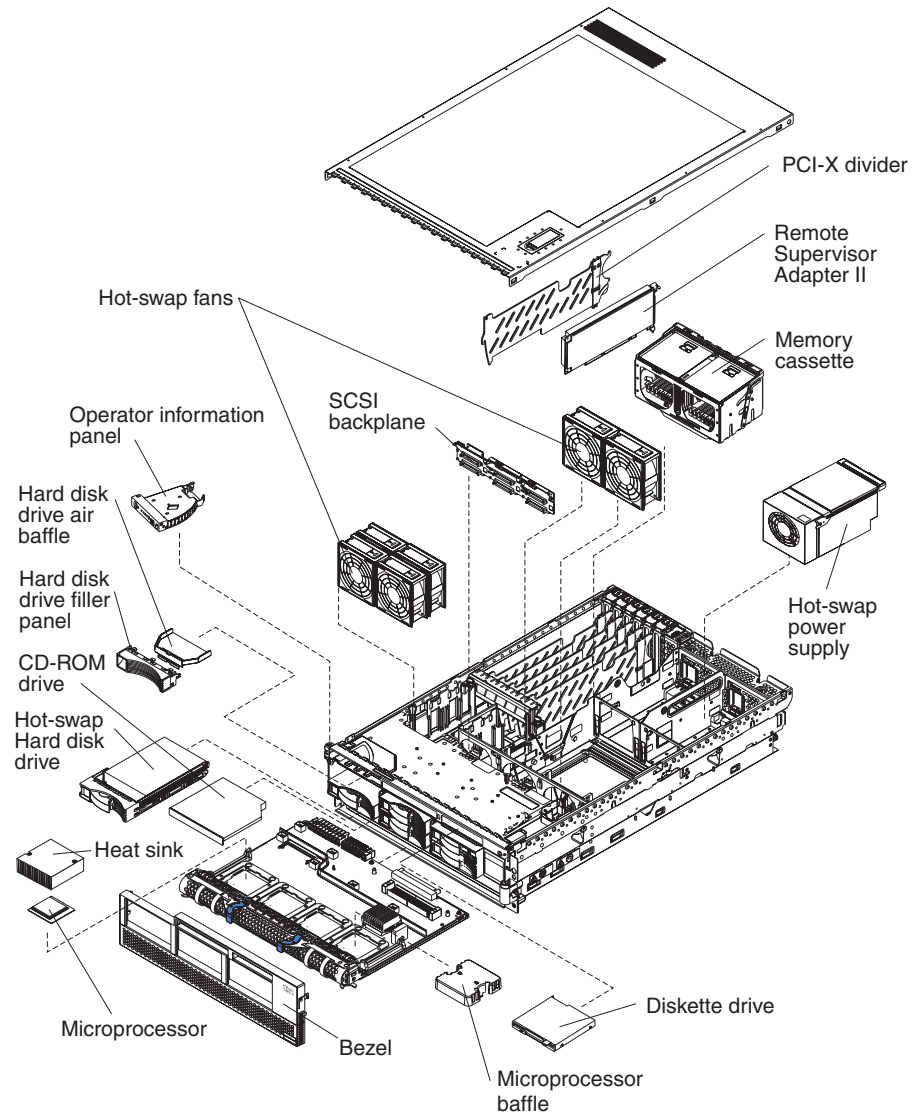
Major components of the xSeries 365 server

The orange color on components and labels in the server identifies hot-swap or hot-plug components. You can install or remove these components while the system is running, provided that the server is configured to support this function.

The blue color on components and labels indicates touch points where a component can be gripped, a latch moved, and so on.

The following illustration shows the major components in the server.

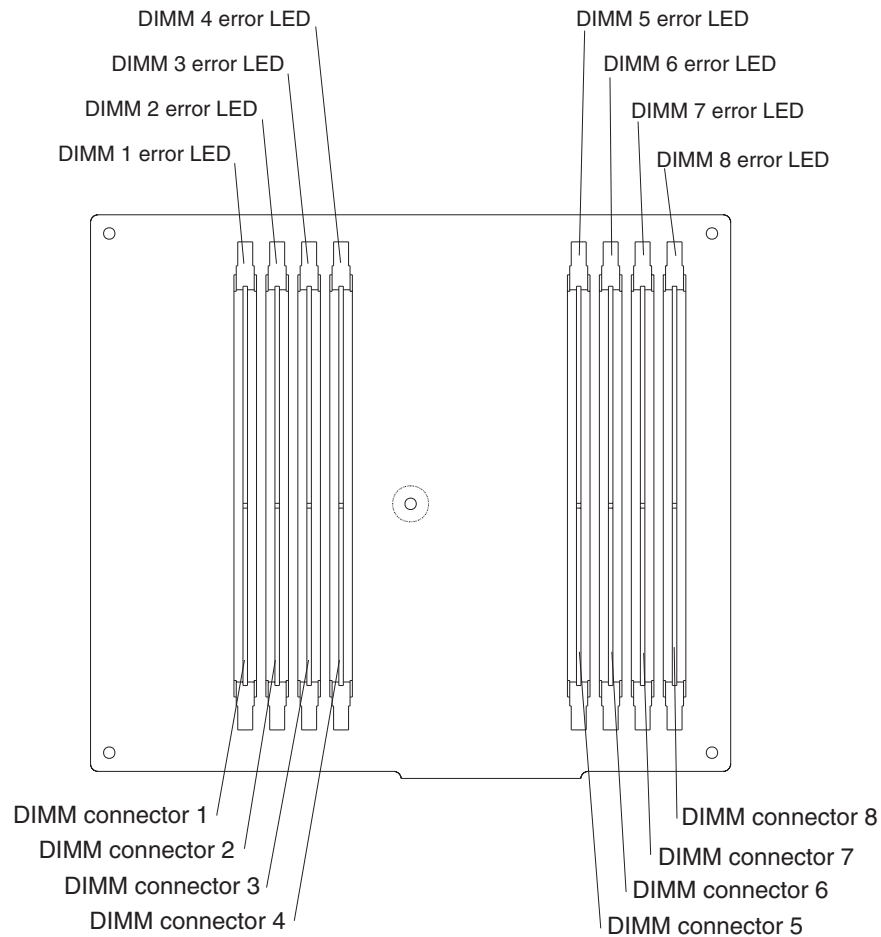
Note: The illustrations in this document might differ slightly from your hardware.



Memory-board connectors and LEDs

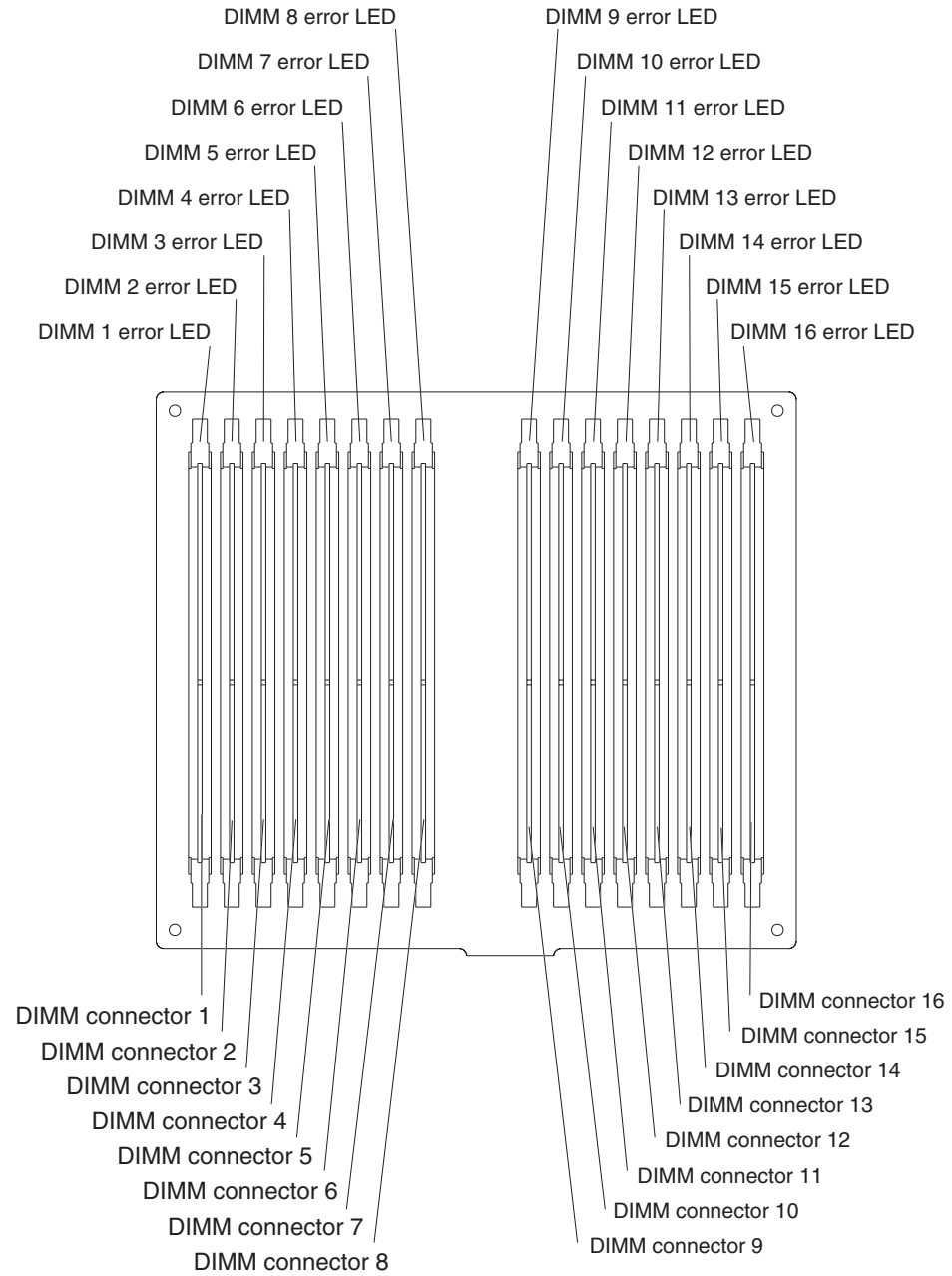
The following illustration shows the internal connectors and LEDs on the 8-DIMM-connector memory board in the memory cassette.

Note: The lit LEDs light the connector retaining clips; look for a lit retaining clip to locate a failed DIMM.



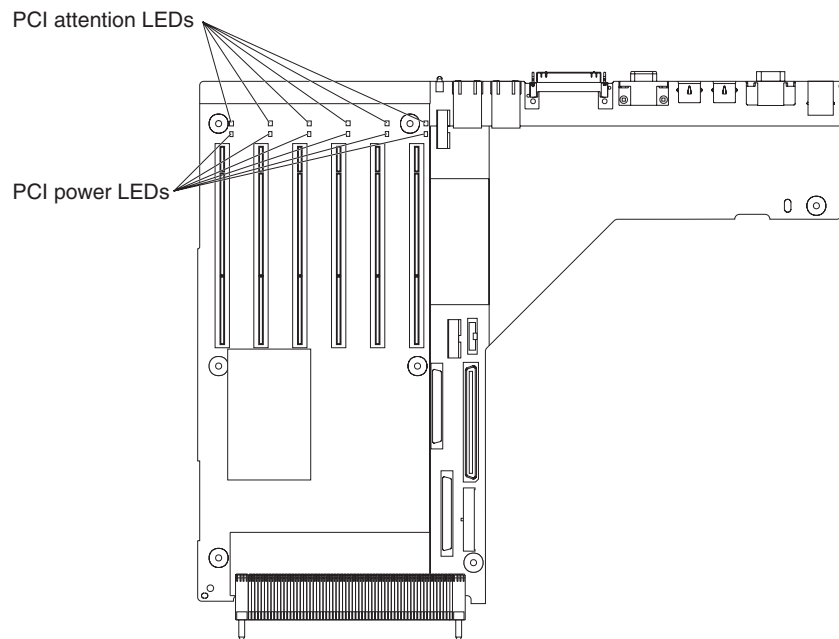
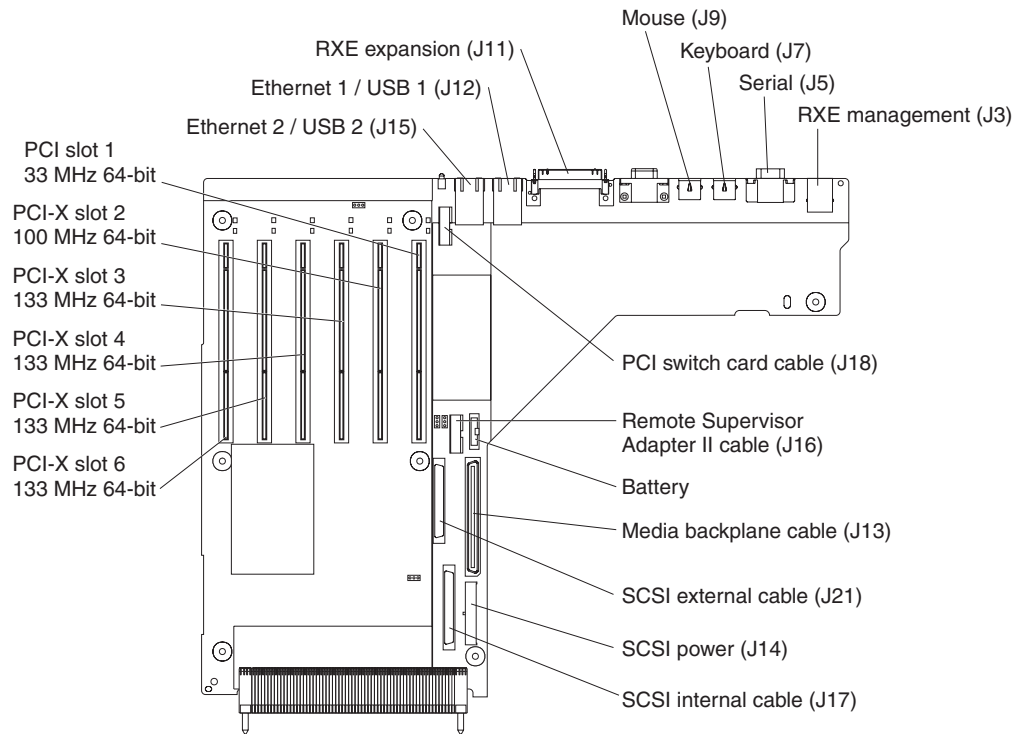
The following illustration shows the internal connectors and LEDs on the 16-DIMM-connector memory board in the memory cassette.

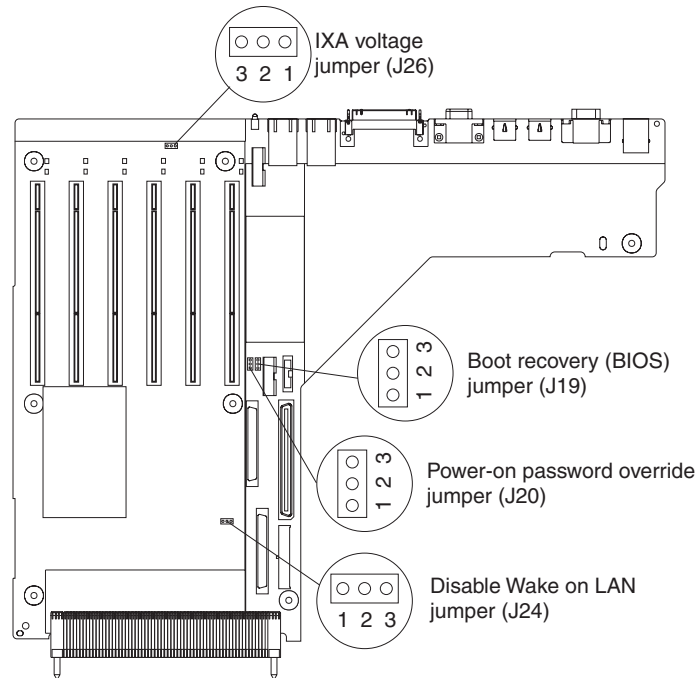
Note: The lit LEDs light the connector retaining clips; look for a lit retaining clip to locate a failed DIMM.



I/O-board connectors, jumpers, and LEDs

The following illustrations show the connectors, jumpers, and LEDs on the I/O board.





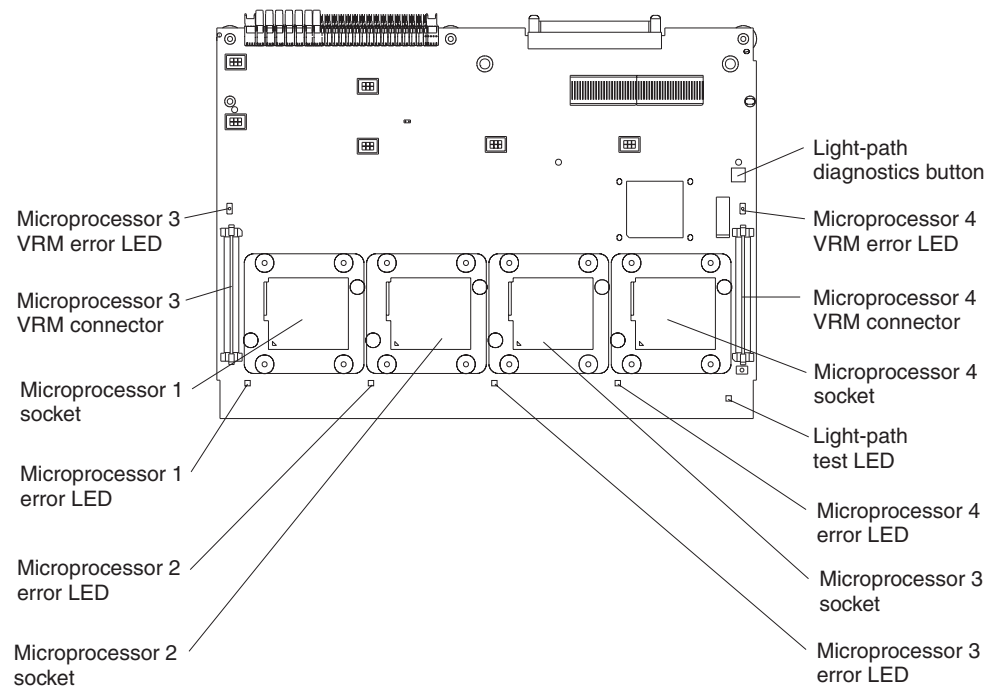
The I/O board contains three-pin jumper blocks. The following table describes the purposes of the jumpers

Table 1. Jumpers on the I/O board

Jumper name	Description
Boot recovery (BIOS) (J19)	<p>The default position is pins 1 and 2.</p> <p>See the section about recovering the BIOS code in the <i>Hardware Maintenance Manual and Troubleshooting Guide</i> on the IBM xSeries Documentation CD for additional information.</p>
Power-on password override (J20)	<p>The default position is pins 1 and 2. Changing the position of this jumper to pins 2 and 3 bypasses the power-on password check.</p> <p>Changing the position of this jumper does not affect the administrator password check if an administrator password is set.</p> <p>See the section about using passwords in the <i>User's Guide</i> on the IBM xSeries Documentation CD for additional information about the power-on password.</p>
Disable Wake on LAN (J24)	<p>The default position is pins 1 and 2. Move the jumper to pins 2 and 3 to prevent a Wake on LAN (WOL) packet from waking the system when the system is in the powered-off state.</p>
IXA voltage (J26)	<p>The default position is pins 1 and 2. Move the jumper to pins 2 and 3 when an IXA adapter is installed in PCI slot 3.</p>

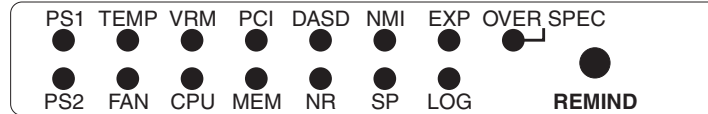
Microprocessor board connectors and LEDs

The following illustration shows the internal connectors and LEDs on the microprocessor board in the microprocessor tray.



Light path diagnostics panel

The following illustration shows the LEDs on the light path diagnostics panel, which is on the side of the operator information panel.



For more information about light path diagnostics, see the *Hardware Maintenance Manual and Troubleshooting Guide*. The following table describes the LEDs on the light path diagnostics panel.

Light path diagnostics panel LED	Description
PS1	Power supply number 1 failure
PS2	Power supply number 2 failure
TEMP	System over temperature condition
FAN	Fan failure
VRM	VRM failure
CPU	Microprocessor failure
PCI	PCI failure
MEM	Memory failure
DASD	Hard disk drive or SCSI backplane failure
NR	Nonredundant power mode
NMI	Nonmaskable interrupt
SP	Service processor error
EXP	Attached expansion I/O failure
LOG	See event log or Remote Supervisor Adapter II log for non-optimal condition information
OVER SPEC	Power supplies being overdriven
REMIND button	Press to invoke remind mode

Note: The NR LED is lit only when two power supplies are installed and one is not functioning.

Use the REMIND button to put the system-error LED on the operator information panel into the Remind mode (flashes every 2 seconds). By pressing this button, you acknowledge the failure but indicate that you will not take immediate action. If a new failure occurs, the system-error LED is lit again.

The system-error LED stays in Remind mode until one of the following conditions occurs:

- All known problems are resolved
- The system is restarted
- A new problem occurs

You can use the REMIND button to delay server maintenance until a later time.

Light path diagnostics might direct you to look for an LED that identifies the specific failing component on the internal boards. See the illustrations in this chapter that identify the LEDs on the boards.

Chapter 2. Installing options

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

Installation guidelines

Before you begin installing options in your server, read the following information:

- Read the safety information beginning on page v and the guidelines in “Handling static-sensitive devices” on page 12. This information will help you work safely with your server and options.
- Make sure that you have an adequate number of properly grounded electrical outlets for your server, monitor, and other devices that you will connect to the server.
- Back up all important data before you make changes to disk drives.
- Have a small Phillips screwdriver available.
- Have a small flat-blade screwdriver available.
- You do not need to turn off the server to install or replace hot-swap power supplies, hot-swap fans, or hot-plug Universal Serial Bus (USB) devices.
- The orange color on components and labels identifies hot-swap or hot-plug components. You can install or remove hot-swap and hot-plug components while the server is running, provided that the server is configured to support this capability. See the instructions in this chapter for more information about removing and installing hot-swap and hot-plug components.
- The blue color on components and labels indicates touch points, where a component can be gripped, a latch moved, and so on.
- For a list of supported options for your server, go to <http://www.ibm.com/pc/compat/>.

System reliability guidelines

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

- Each of the drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed in it.
- There is adequate space around the server to allow the server cooling system to work properly. See the documentation that comes with the rack.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan as soon as possible.
- You have replaced a hot-swap drive within 2 minutes of removal.
- Microprocessor sockets 2, 3, and 4 each contain either a microprocessor baffle or a microprocessor and heat sink at all times.

Working inside the server with the power on

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

- Avoid wearing loose-fitting clothing on your forearms. Button long-sleeved shirts before 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 electronic devices, including your server. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

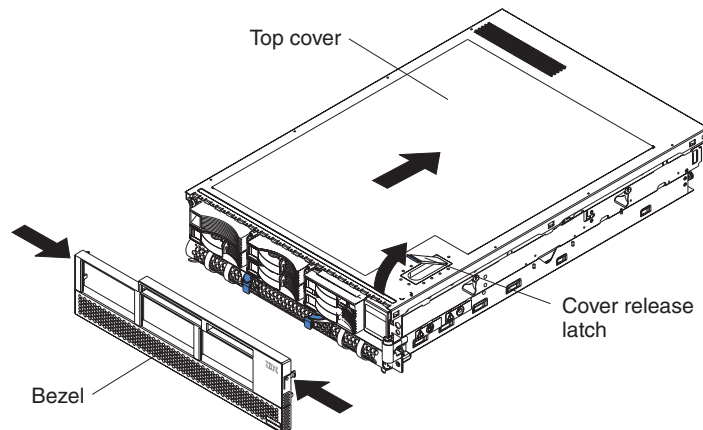
To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- 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 your server cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Removing the cover and bezel

Complete the following steps to remove the cover and bezel:

1. Read the safety information beginning on page v, and “Installation guidelines” on page 11.
2. If you are installing or replacing a non-hot-swap component, turn off the server and all attached peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Slide the server out of the rack until the slide rails lock into place.



4. Lift the cover-release latch. The cover slides to the rear approximately 13 mm (0.5 inch). Lift the cover off the server.

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

5. Press on the bezel retention tabs at the top edge of the bezel, and pull the top of the bezel slightly away from the server.
6. Lift the bezel up to release the two tabs at the bottom edge of the bezel.

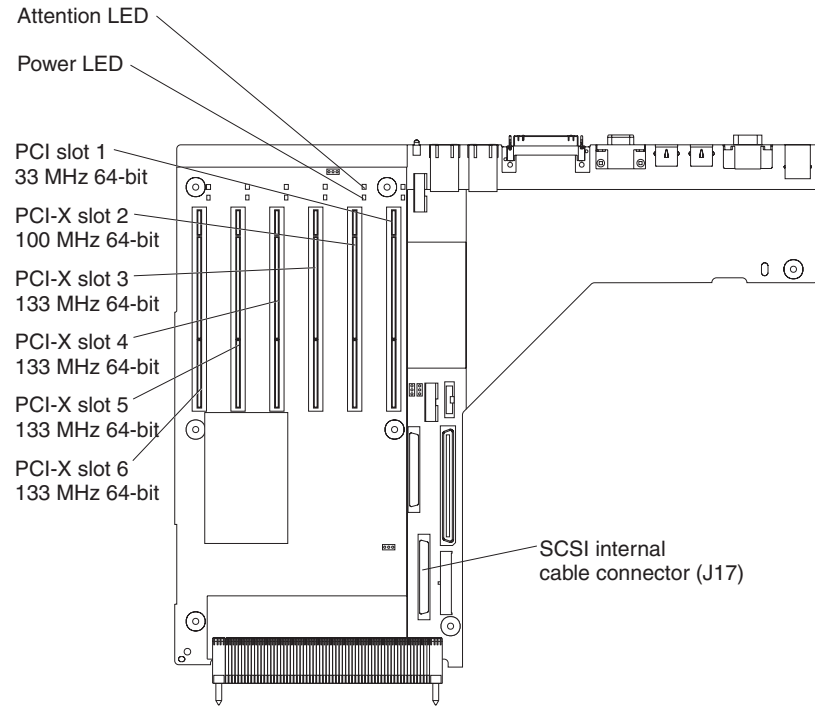
Installing a PCI or PCI-X adapter

Attention: The Remote Supervisor Adapter II, which is in PCI slot 1, is *not hot-pluggable*. Turn off the server before removing or replacing the Remote Supervisor Adapter II.

The following notes describe the types of adapters that your server supports and other information that you must consider when installing a PCI or PCI-X adapter:

- The server supports 3.3 V and universal PCI and PCI-X adapters; it does not support 5.0-V-only adapters.
- The following illustration shows the location and bus speeds of the PCI-X expansion slots on the I/O board.

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



- Slot 1 is a PCI slot and is dedicated to the Remote Supervisor Adapter II. The adapter will operate in PCI mode only. The bus speed is 33 MHz only. The adapter is *not hot-swappable*; turn off the server when removing and installing the adapter.
- Slot 2 supports hot-plugging only for an adapter with a speed of 100 MHz or higher. You can install an adapter with a speed less than 100 MHz in this slot only while the server is turned off; the bus speed will be set to the speed of the adapter.
- For slots 3 through 6, the bus speed will be set to the speed of the adapter; if a PCI adapter is installed, the bus will run in PCI mode.
- If you install a ServeRAID™ 6i adapter, it must be installed in slot 2.
- If you install an IXA adapter, it must be installed in slot 3 and you must set the IXA jumper on the I/O board. See page 7 for the location and setting of the IXA jumper.
- Each PCI/PCI-X slot is on a separate PCI bus.
- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this chapter.
- If you need to change switch settings or jumper settings on the adapter, follow the instructions that come with the adapter.
- Your server scans devices and PCI-X slots to assign system resources in the following order: CD-ROM drive; disk drives; integrated Ethernet controller; integrated SCSI devices; and PCI-X slots 1, 2, 3, 4, 5, and 6. If an RXE-100 enclosure is attached to the server, the scan continues in sequence with PCI slots 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18.

Note: You can use the Configuration/Setup Utility program to change the sequence and have the server scan one of the first six PCI slots before it scans the integrated devices. You cannot change the scan sequence of the PCI slots in an RXE-100 enclosure.

- The PCI-X slot numbers in an RXE-100 enclosure are assigned in the following order:

Slots in RXE-100 enclosure	Slot numbers assigned to A side	Slot numbers assigned to B side
6 slots on A side only	7 - 12* (A1 - A6)	none
6 slots on B side only	none	7 - 12* (B1 - B6)
12 slots	7 - 12 (A1 - A6)	13 - 18 (B1 - B6)
* Both sides are numbered 7 - 12 when an RXE-100 enclosure is shared		

- If you install a RAID adapter other than a ServeRAID 6i adapter to control internal hot-swap hard disk drives, you might need to disconnect the internal channel cable from the SCSI RAID cable connector (J17) on the I/O board and connect it to the RAID adapter. No recabling is needed for a ServeRAID 6i adapter. See the information that comes with your RAID adapter.
- If you install a RAID adapter to control external hard disk drives, connect one end of the RAID external channel cable (separately orderable) to an external channel connector on the edge of the RAID adapter that is accessible from the rear of the server; then, route the cable to the external SCSI device and connect it to the applicable connector.

Note: See the documentation that comes with the RAID adapter for any additional cabling instructions. That documentation also provides information about installing the RAID software and configuring the RAID adapter. For a list of supported RAID adapters, go to <http://www.ibm.com/pc/us/compat/>.

- Before attempting to install a new adapter, make sure that there is an available slot at the correct bus speed for it. If you need additional PCI-X slots, you can purchase a remote I/O expansion enclosure through your IBM marketing representative or authorized reseller.

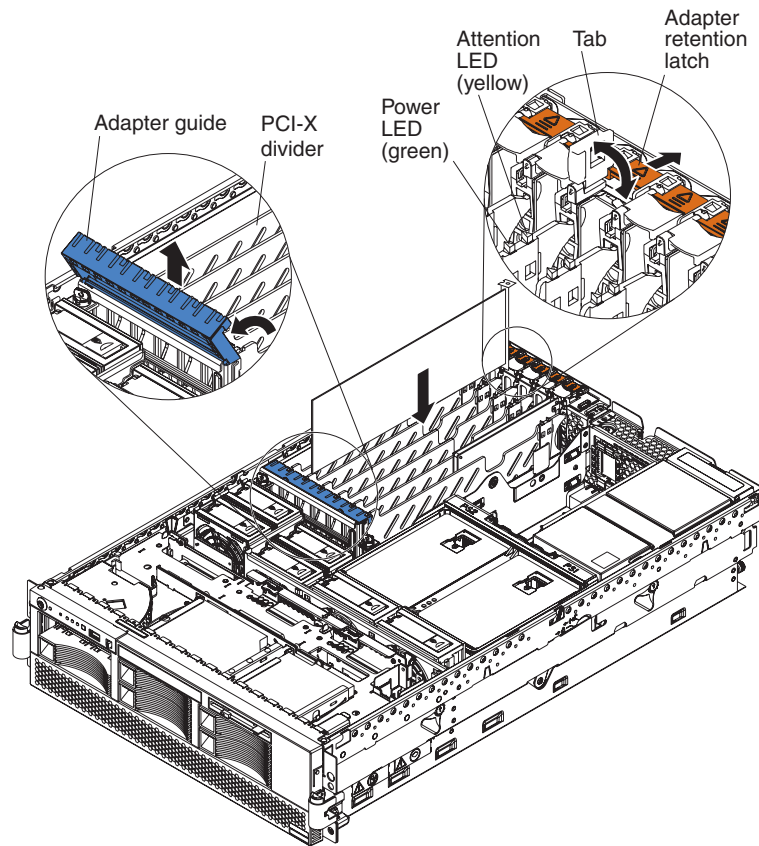
Note: Before hot-swapping any PCI-X adapters, read the information in “Working inside the server with the power on” on page 11.

Complete the following steps to install a PCI/PCI-X adapter.

Note: For hot-pluggable adapters, make sure that the PCI hot-plug device driver is installed. For details, see the documentation that comes with the adapter. For more detailed instructions and information about installing PCI/PCI-X adapters, see the section about installing options in the *Option Installation Guide* on the IBM *xSeries Documentation CD*.

1. Review the safety information beginning on page v and “Installation guidelines” on page 11.
2. If the adapter is not hot-pluggable, turn off the server and peripheral devices, and disconnect the power cords and all external cables.

3. Remove the server cover (see “Removing the cover and bezel” on page 13) and determine which PCI-X expansion slot you will use for the adapter.



4. See the documentation that comes with your adapter for instructions for setting jumpers or switches and for cabling.

Note: Route adapter cables before you install the adapter.

5. Install the adapter:
 - a. Open the blue adapter guide by lifting the front edge, as shown in the illustration.
 - b. Push the orange adapter retention latch toward the rear of the server and open the tab. The power LED turns off for the slot.
 - c. Remove the expansion-slot cover.

- d. Carefully grasp the adapter by its top edge or upper corners, and align it with the connector on the PCI-X board.
- e. If necessary remove the extension handles or bracket before installing a long adapter.

Attention: When you install an adapter, avoid touching the components and gold-edge connectors on the adapter. Be sure the adapter is correctly seated in the connector. Incorrectly seated adapters might cause damage to the I/O board or to the adapter.

- f. Press the adapter *firmly* into the adapter connector.
 - g. Push down on the blue adapter guide to stabilize the adapter.
 - h. Close the tab; then, push down on the blue adapter retention latch until it clicks into place, securing the adapter.
6. Connect any required cables to the adapter.

7. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 35.

Installing a hot-swap hard disk drive

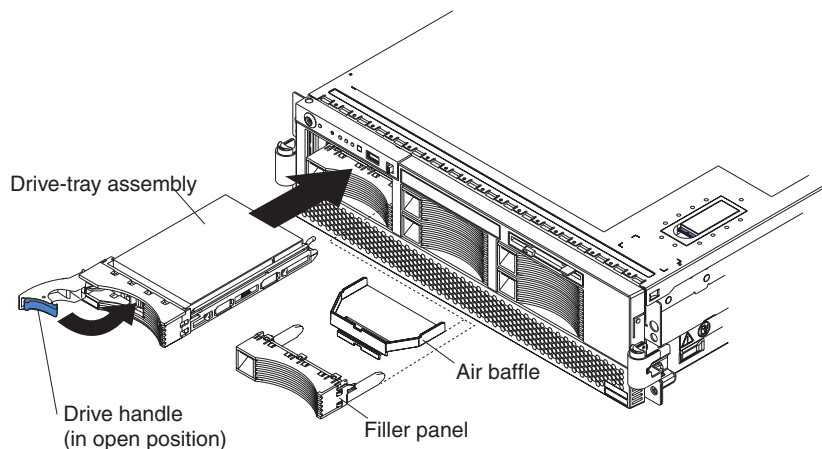
The following notes describe the types of hard disk drives that your server supports and other information that you must consider when installing a hard disk drive:

- The server supports up to six 26 mm (1-inch), 3.5-inch, hot-swap hard disk drives in the hot-swap bays.
- Each hot-swap drive is in a tray, which has a green activity LED and an amber status LED in the upper-right corner. The activity LED flashes when the drive is active; the status LED is lit if the drive has an error. Each hot-swap drive has a single-connector-attached (SCA) connector, which connects directly into the hot-swap SCSI hard disk drive backplane. The backplane controls the SCSI IDs for the hot-swap drives.
- Before you install a hot-swap hard disk drive, take the following actions:
 - Inspect the drive tray for any signs of damage.
 - Make sure that the drive is installed in the tray correctly.
 - If your server has an optional RAID adapter installed, see the documentation that comes with the adapter for information about installing a hard disk drive.

Complete the following steps to install a hard disk drive:

1. Review the safety information beginning on page v and “Installation guidelines” on page 11.
2. Remove the filler panel and air baffle from one of the empty hot-swap bays, if present.

Attention: To maintain proper system cooling, do not operate the server for more than 10 minutes without either a drive or filler panel and air baffle installed in each bay.



3. Install the hard disk drive in the hot-swap bay:
 - a. Make sure that the tray handle is open (that is, perpendicular to the front of the drive).
 - b. Align the drive assembly with the guide rails in the bay.
 - c. Gently push the drive assembly into the bay until the drive stops.
 - d. Push the tray handle to the closed (locked) position.
 - e. Check the hard disk drive status LED to make sure that the hard disk drive is operating correctly. If the amber hard disk drive status LED for a drive is

lit continuously, that drive is faulty and needs to be replaced. If the green hard disk drive activity LED is flashing, the drive is being accessed.

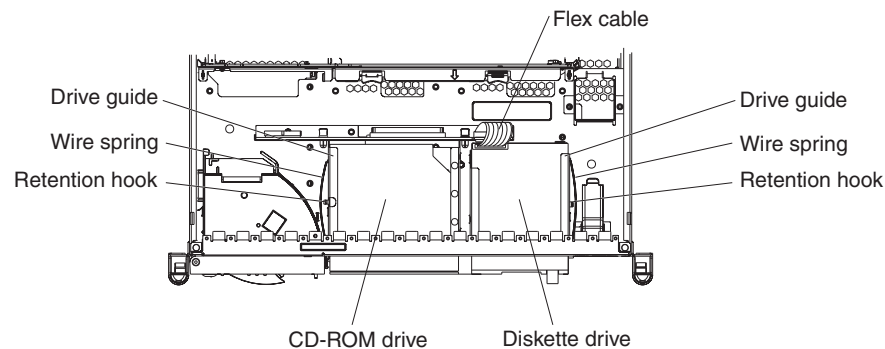
4. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 35.

Note: If the server has a RAID controller or adapter installed, you might need to reconfigure the disk arrays after installing hard disk drives. See the documentation that comes with the adapter for more information.

Replacing the CD-ROM drive

Complete the following steps to replace the CD-ROM drive:

1. Review the safety information beginning on page v, and “Installation guidelines” on page 11.
2. Turn off the server, disconnect all power cords and external cables, and remove the top cover (see “Removing the cover and bezel” on page 13).



3. Slip the wire spring from under the retention hook and pull it away from the drive. Set the wire spring aside.
4. Slide the drive out the front of the server.
5. Slide the replacement drive into the bay.
6. Align the holes in the side of the drive with the hole in each drive guide.
7. Push each end of the wire spring through the hole in the drive guide and into the hole in the drive, beginning with the front hole; then, push the middle of the wire spring under the retention hook.
8. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 35.

Installing memory modules

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

- Your server supports 2.5 V, 184-pin, error correcting code (ECC), double-data rate (DDR) SDRAM, PC2100 registered DIMMs with Chipkill memory protection™.
- DIMMs can be removed and replaced through the access doors on the top of the memory cassette.
- You can increase the amount of memory in the server by replacing the DIMMs with higher-capacity DIMMs or installing additional pairs of DIMMs in open sockets. The server supports 512 MB, 1 GB, and 2 GB DIMMs. See the

ServerProven[®] list at <http://www.ibm.com/pc/compat/> for an updated list of memory modules supported by the server.

- For a server with an 8-DIMM-connector memory cassette, you can increase the memory capabilities of your server by upgrading to the 16-DIMM-connector memory cassette. The 16-DIMM-connector memory cassette supports memory mirroring and Memory ProteXion[™]. See the ServerProven list at <http://www.ibm.com/pc/compat/> for a list of memory cassettes supported by the server.
- Your server uses interleaved DIMMs, which require that you install the DIMMs in specific configurations:
 - In the 8-DIMM-connector memory cassette, install DIMMs in pairs. Each pair must be of the same type, capacity, and speed. The DIMM connectors are arranged in two groups of four rows each; the server comes with one pair of DIMMs installed in DIMM connectors 1 and 5 in the memory cassette.
 - In the 16-DIMM-connector memory cassette, the DIMM connectors are arranged in two groups of eight rows each. In non-mirrored mode, install DIMMs in pairs; in mirrored mode, install DIMMs in quads, or groups of 4. Each pair or quad must be of the same type, capacity, and speed.
- You must populate the DIMM connectors in the following order:

8-DIMM memory board

First pair	DIMMs 1 and 5
Second pair	DIMMs 2 and 6
Third pair	DIMMs 3 and 7
Fourth pair	DIMMs 4 and 8

16-DIMM memory board in non-mirrored mode

First pair	DIMMs 1 and 3
Second pair	DIMMs 14 and 16
Third pair	DIMMs 2 and 4
Fourth pair	DIMMs 13 and 15
Fifth pair	DIMMs 5 and 7
Sixth pair	DIMMs 10 and 12
Seventh pair	DIMMs 6 and 8
Eighth pair	DIMMs 9 and 11

16-DIMM memory board in mirrored mode

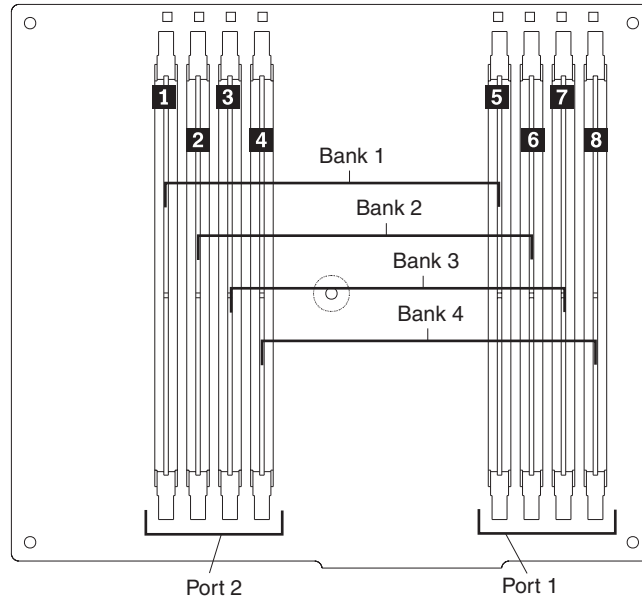
First quad	DIMMs 1, 3, 14, and 16
Second quad	DIMMs 2, 4, 13, and 15
Third quad	DIMMs 5, 7, 10 and 12
Fourth quad	DIMMs 6, 8, 9 and 11

Use the Configuration/Setup Utility program to enable or disable mirrored mode. Memory mirroring enables you to improve the memory reliability of your server by creating a mirror of the data in memory port 1 and storing it in memory port 2. For memory mirroring to work, you must have the same amount of memory in both memory ports, and you must have DIMMs of the same size and clock speed in both memory ports.

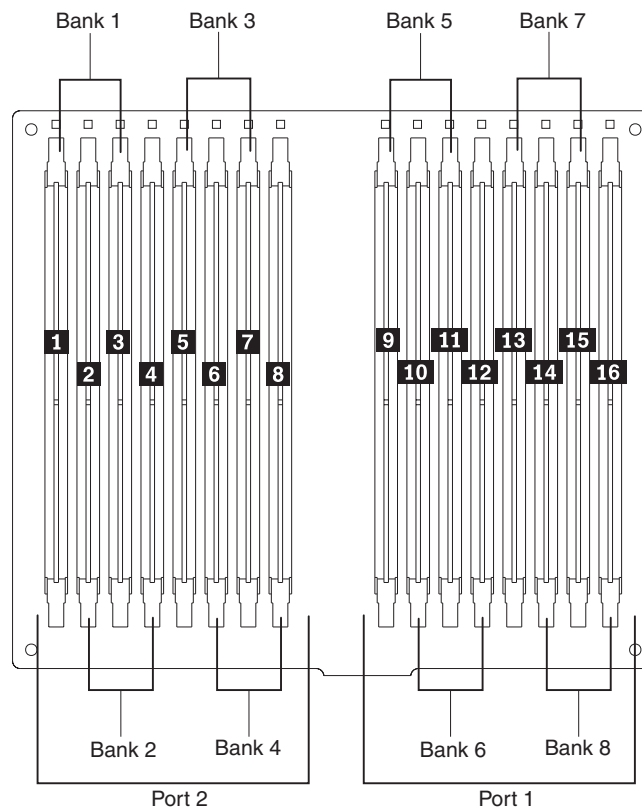
Note: When memory mirroring is enabled, reported memory is reduced to half of installed memory.

- The DIMMs constitute the following memory banks and use the following memory ports:

8-DIMM memory board



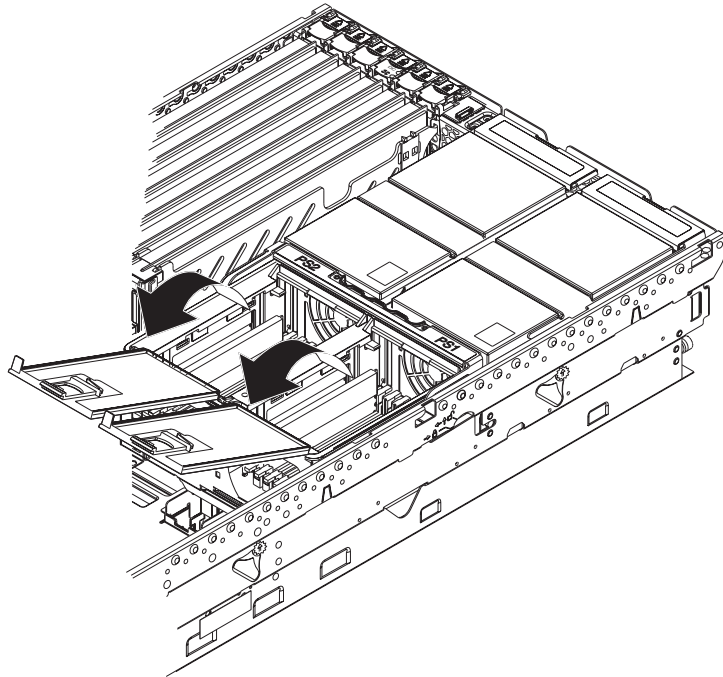
16-DIMM memory board



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

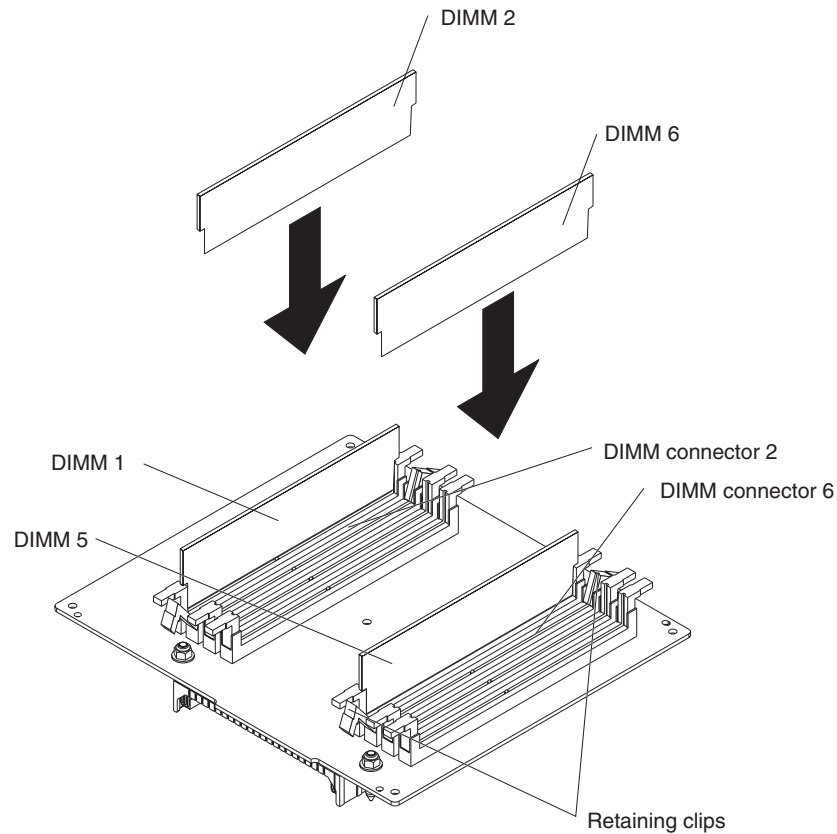
Complete the following steps to install DIMMs:

1. Review the safety information beginning on page v, “Installation guidelines” on page 11, and the documentation that comes with the DIMMs.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables. Remove the top cover (see “Removing the cover and bezel” on page 13).
3. Open the two DIMM access doors on the top of the memory cassette.



4. Open the retaining clip on each end of the DIMM connector.
Attention: To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.
5. Touch the static-protective package that contains the DIMM option to any unpainted metal surface on the server. Then, remove the DIMM from the package.
6. Turn the DIMM so that the DIMM keys align correctly with the slot.

Note: The following illustration shows installing DIMMs in an 8-DIMM-connector memory board.



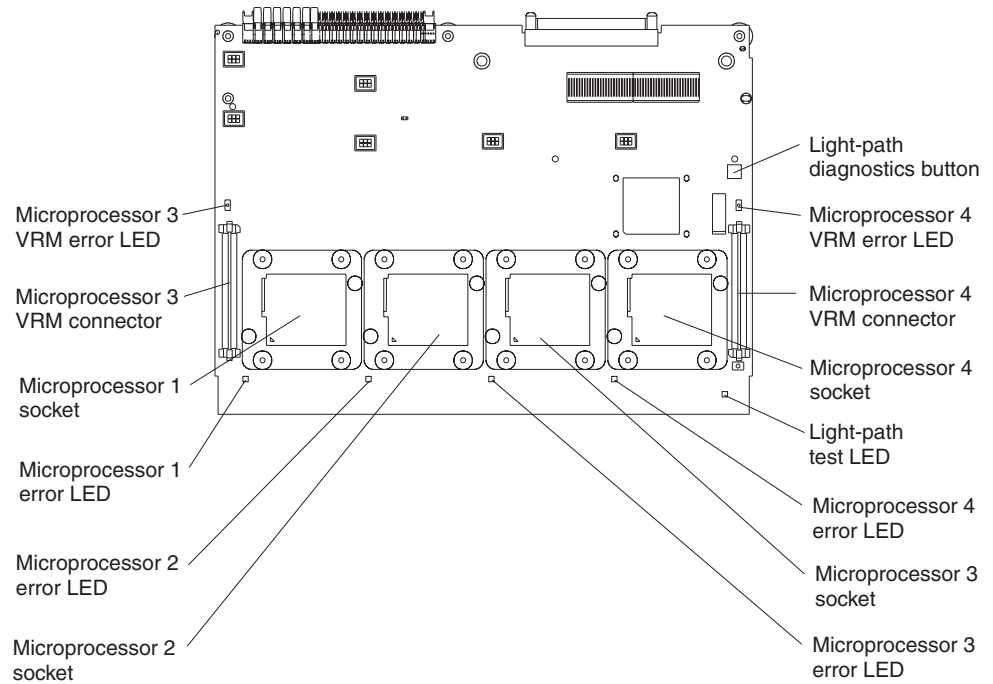
7. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is firmly seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly inserted; open the retaining clips, remove the DIMM, and then reinsert it.
8. Repeat steps 4 on page 21 through 7 for each additional DIMM that you install. Close the DIMM access doors when you have finished.
9. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 35.

Installing a microprocessor

The following notes describe information that you must consider when installing a microprocessor in the server:

- The server comes with a minimum of one microprocessor installed on the microprocessor board in the microprocessor tray and supports up to four microprocessors. With more than one microprocessor, the server can operate as a symmetric multiprocessing (SMP) server. With SMP, certain operating systems and application programs can distribute the processing load among the microprocessors. This enhances performance for database and point-of-sale applications, integrated manufacturing solutions, and other applications. The following illustration shows the microprocessor connectors and the microprocessor voltage regulator module (VRM) connectors on the microprocessor board.

Note: The VRMs for microprocessors 1 and 2 are integrated on the microprocessor board; the VRMs for microprocessors 3 and 4 come with the microprocessor options and must be installed on the microprocessor board.



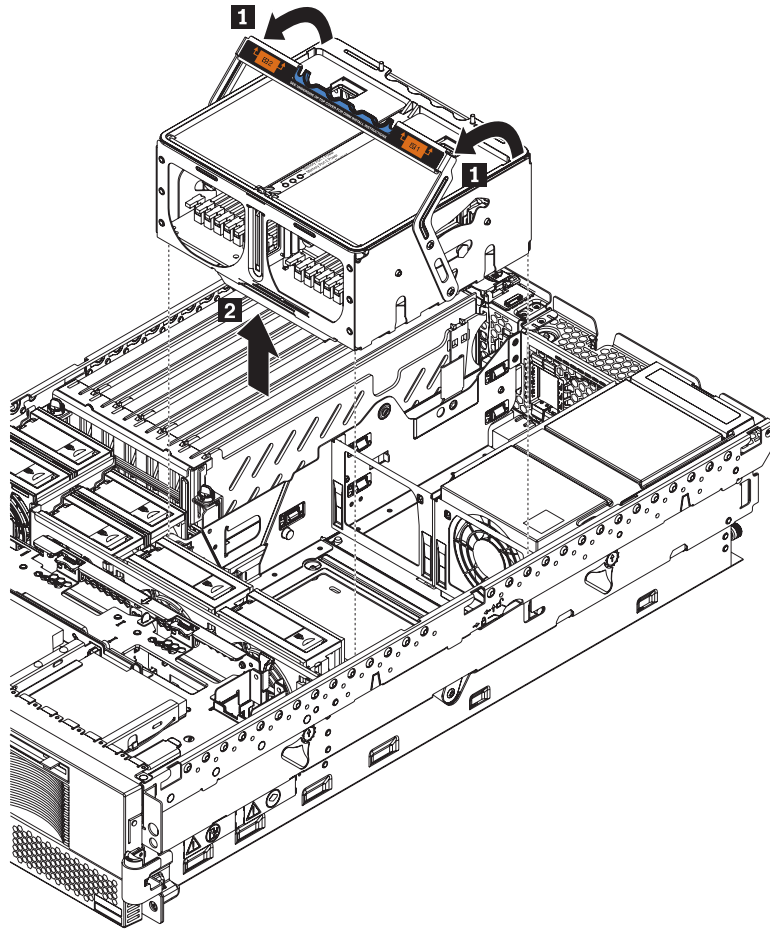
- If one microprocessor is installed:
 - The microprocessor is installed in microprocessor connector 1 (U22).
 - The microprocessor supports both the startup and application processes.
- If you install additional microprocessors in the server, microprocessor 2 is installed in microprocessor connector 2 (U23); microprocessor 3 is installed in connector 3 (U24); microprocessor 4 is installed in connector 4 (U25).
- A new microprocessor comes in a kit with a VRM and a heat sink. The VRM is used only with microprocessor 3 or 4.
- Read the documentation that comes with the microprocessor to determine whether you need to update the server basic input/output system (BIOS) code. The most current level of BIOS code for the server is available from <http://www.ibm.com/pc/support>.
- To use SMP, obtain an SMP-capable operating system. For a list of supported operating systems, go to <http://www.ibm.com/pc/us/compat/>.

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

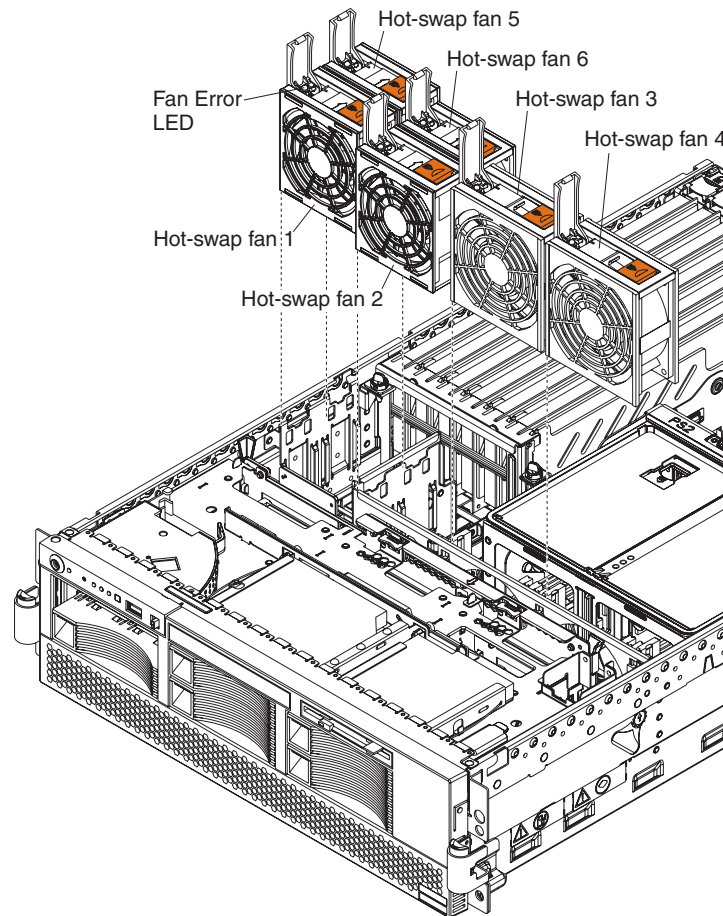
- Ensure that the microprocessors are the same type, have the same cache size, and have the same clock speed.
- Ensure that the microprocessor internal and external clock frequencies are identical.
- See the ServerProven list at <http://www.ibm.com/pc/compat/> for a list of microprocessors supported by the server.
- When installing additional microprocessors, populate the microprocessor connectors in numeric order, starting with connector 2. If you install the microprocessors in the wrong order, the server will not turn on.
- Avoid touching the components and pins on the microprocessor. Make sure that the microprocessor is completely and correctly seated in the socket. Incomplete insertion might cause damage to the microprocessor board or to the microprocessor.

Complete the following steps to install a microprocessor:

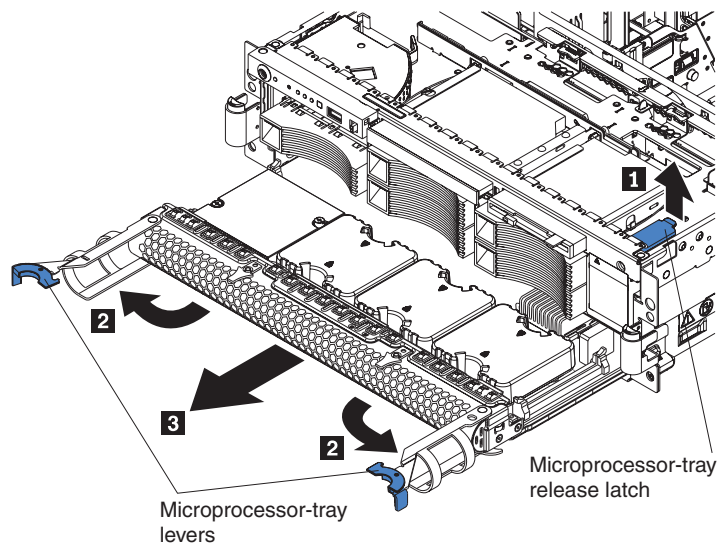
1. Review the safety information beginning on page v and “Installation guidelines” on page 11.
2. Turn off the server and all peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server cover and bezel (see “Removing the cover and bezel” on page 13).
4. Remove the microprocessor tray:
 - a. Remove the memory cassette. See “Replacing the memory cassette” on page 34 for instructions.



- b. Remove all fans. See “Replacing a hot-swap fan” on page 33 for instructions.

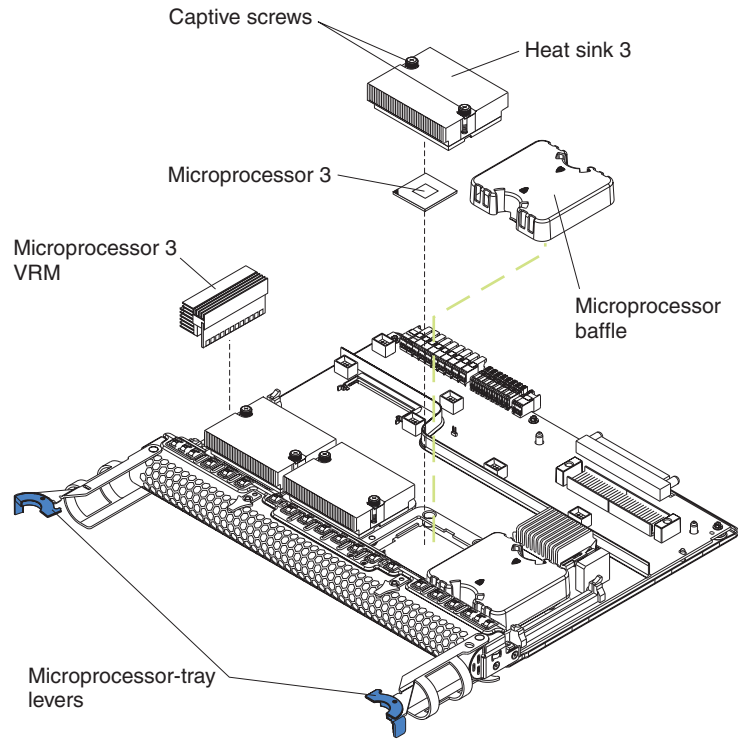


- c. Lift the microprocessor-tray release latch (**1**).



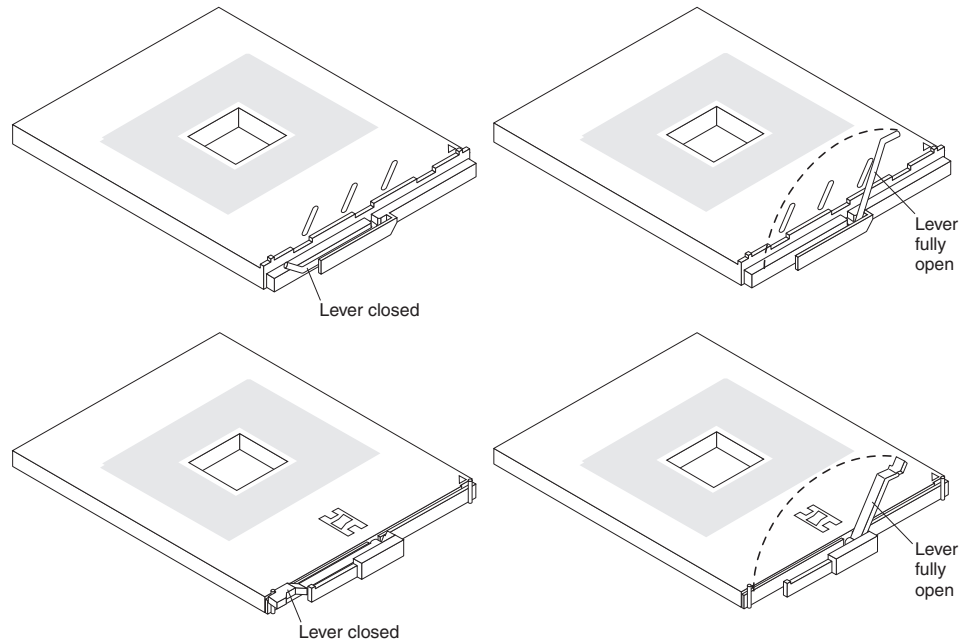
- d. Open the microprocessor-tray levers (**2**).
 e. Pull out the microprocessor tray (**3**).

Attention: The microprocessor tray is heavy. Pull the tray part-way out of the server, reposition your hands to grasp the body of the tray, and then pull the tray out the rest of the way.



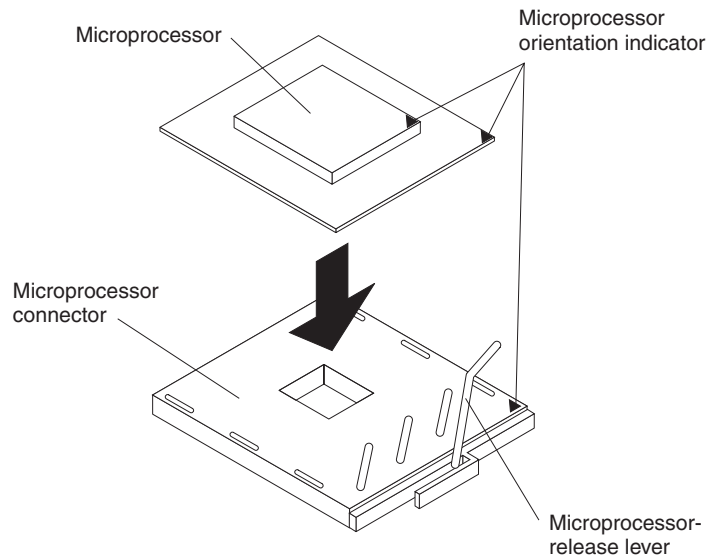
Note: The new microprocessor comes in a kit with a VRM and a heat sink. The VRM is used only with microprocessors 3 and 4.

5. Remove the microprocessor baffle from the empty microprocessor socket and store the microprocessor baffle for future use.
6. Remove the protective cover, tape, or label from the surface of the microprocessor socket, if any is present.
7. Lift the microprocessor-release lever to the fully-open position (135°).



Attention: You must ensure that the locking lever on the microprocessor socket is in the fully-open position before you insert the microprocessor in the socket. Failure to do so might result in permanent damage to the microprocessor, microprocessor socket, and system board.

8. Install the microprocessor:
 - a. Touch the static-protective package containing the new microprocessor to any *unpainted* metal surface on the server; then, remove the microprocessor from the package.
 - b. Position the microprocessor over the microprocessor socket as shown in the following illustration. Carefully press the microprocessor into the socket.



9. Close the microprocessor-release lever to secure the microprocessor.

Attention:

- Do not disturb or contaminate the thermal material on the bottom of the new heat sink. Doing so damages its heat-conducting capability and exposes the new microprocessor to overheating.
 - If you need to remove the heat sink after installing it, note that the thermal material 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. Loosening one captive screw fully before loosening the other captive screw helps break the bond between the components without damaging them.
10. Remove the heat sink from its package and remove the cover from the bottom of the heat sink. Make sure that the thermal material is still on the bottom of the heat sink. Remove the release liner and orient the heat sink above the microprocessor; then, press the heat sink into place. Press firmly on the captive screws and tighten them, alternating between screws until they are tight. Do not overtighten the screws.
 11. If you installed the microprocessor in connector 3 or 4, install the VRM in the applicable microprocessor VRM connector (VRM connector 3 for microprocessor 3, VRM connector 4 for microprocessor 4).
 - a. Open the retaining clips at either end of the VRM connector.

- Attention:** To avoid breaking the VRM retaining clips or damaging the VRM connectors, open and close the clips gently.
- b. Turn the VRM so that the VRM keys align correctly with the connector.
 - c. Insert the VRM into the connector. Firmly press the VRM straight down into the connector by applying pressure on both ends of the VRM simultaneously. The retaining clips snap into the locked position when the VRM is firmly seated in the connector. If there is a gap between the VRM and the retaining clips, the VRM has not been correctly inserted; open the retaining clips, remove the VRM, and then reinsert it.
12. Reinstall the microprocessor tray in the server:
 - a. Make sure the microprocessor-tray release latch is open; then, push the microprocessor tray into the server.
 - b. Close the tray levers and make sure they are securely latched.
 - c. Press the microprocessor-tray release latch down.
 - d. Reinstall the fans and memory cassette in the server.
 13. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 35.

Installing a hot-swap power supply

The following notes describe information that you must consider when installing a hot-swap power supply in the server:

- The server comes with a minimum of one power supply and supports up to two power supplies.
- The power supplies are numbered from left to right (1 to 2) as viewed from the rear of the server. Power supplies must be installed in the following sequence: power supply 1, then power supply 2.
- If you install or remove a power supply, observe the following precautions:

Statement 8:

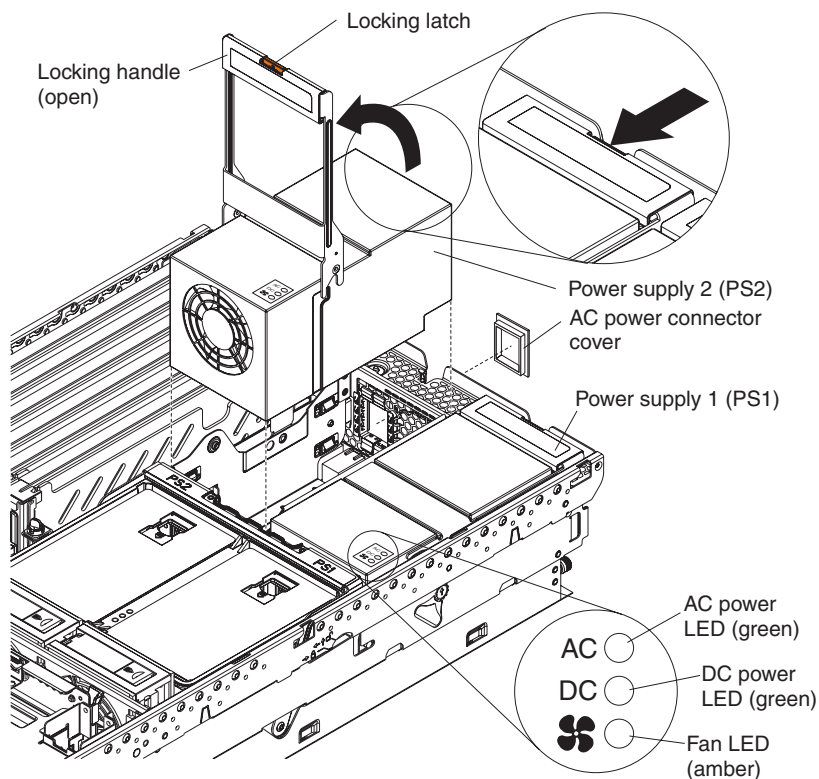


CAUTION:

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



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



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

1. Review the safety information beginning on page v and “Installation guidelines” on page 11.
2. Remove the server cover. See “Removing the cover and bezel” on page 13.
3. If you are adding a power supply to an empty power bay, remove the cover from the ac power connector opening on the rear of the server.

4. If you are replacing a failed power supply, remove the failed power supply from the bay.
 - a. Disconnect the power cord from the connector on the back of the failed power supply.
 - b. Press the locking latch on the power supply handle and raise the power supply handle to the open position.
 - c. Lift the failed power supply out of the bay.
5. Raise the handle on the new power supply to the open position.
6. Place the new power supply into the power bay in the chassis and fully close the locking handle.
7. Connect one end of the power cord for the new power supply into the connector on the back of the power supply; route the power cord through the cable-management arm and connect the other end of the power cord into a properly grounded electrical outlet.
8. Make sure that the ac power LED on the rear of the power supply and the ac power LED on the top of the power supply are lit, indicating that the power supply is operating correctly. If the server is turned on, make sure that the dc power LED on the top of the power supply is lit also.
9. Continue with “Completing the installation” on page 35.

Replacing the battery

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

- When replacing the battery, you must replace it with a lithium battery of the same type from the same manufacturer.
- To order replacement batteries, call 1-800-772-2227 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.
- After you replace the battery, you must reconfigure the system and reset the system date and time.
- To avoid possible danger, read and follow the following safety statement.

Statement 2:



CAUTION:

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

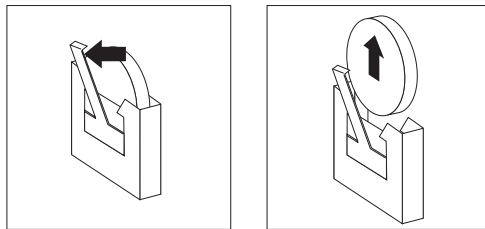
Do not:

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

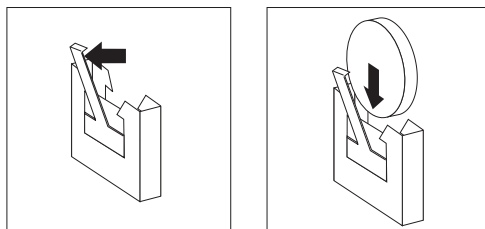
Dispose of the battery as required by local ordinances or regulations.

Complete the following steps to replace the battery:

1. Review the safety information beginning on page v, and “Installation guidelines” on page 11, and follow any special handling and installation instructions supplied with the replacement battery.
2. Turn off the server and all peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server cover (see “Removing the cover and bezel” on page 13).
4. Using the illustration at “I/O-board connectors, jumpers, and LEDs” on page 6 as a reference, locate the battery on the I/O board.
5. Remove the battery:
 - a. Use one finger to press the top of the battery clip away from the battery.
 - b. Lift and remove the battery from the socket.



6. Insert the new battery:
 - a. Position the battery so that the positive (+) symbol is facing away from you.
 - b. Use one finger to press the top of the battery clip away from the battery.
 - c. Press the battery into the socket until it clicks into place. Make sure that the battery clip holds the battery securely.



7. Reinstall the server cover as described in “Installing the cover and bezel” on page 35.
8. Reconnect the external cables; then, reconnect the power cords and turn on the peripheral devices and the server.

Note: You must wait approximately 20 seconds after you connect the power cord of the server to an electrical outlet before the power-control button becomes active.

9. Start the Configuration/Setup Utility program and set configuration parameters.
 - Set the system date and time.
 - Set the power-on password.
 - Reconfigure the server.

See the section about using the Configuration/Setup Utility program in the *User's Guide* on the IBM xSeries Documentation CD for details.

Replacing a hot-swap fan

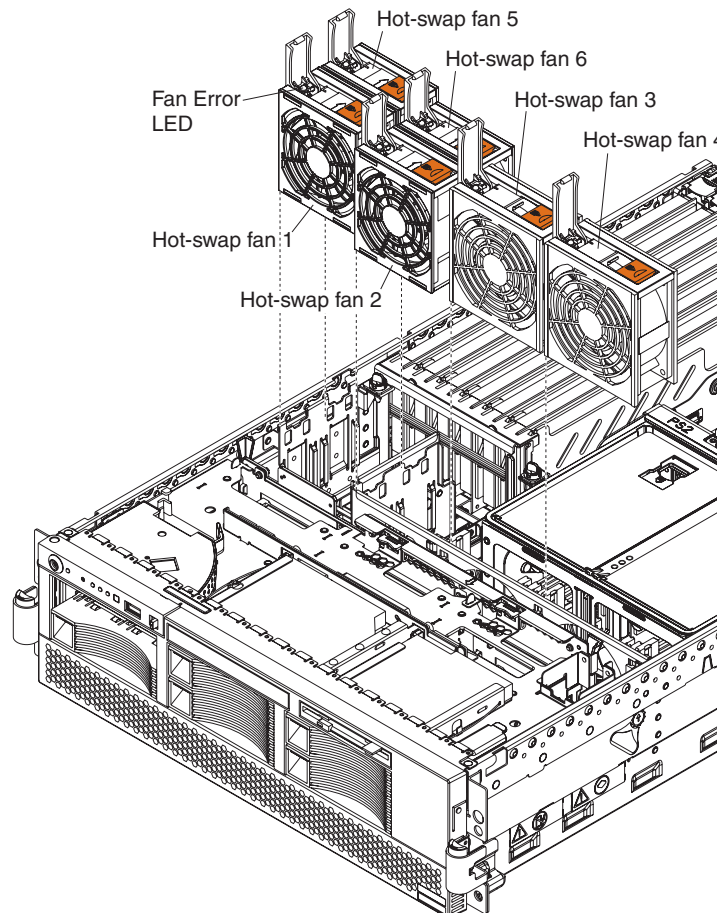
The following notes describe information that you must consider when replacing a hot-swap fan in the server:

- The server comes with six hot-swap fans.
- You do not need to turn off the power to the server to replace a hot-swap fan.

Attention: If a fan fails, replace it within 48 hours to help ensure proper cooling.

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

1. Review the safety information beginning on page v, and “Installation guidelines” on page 11.
2. Remove the top cover (see “Removing the cover and bezel” on page 13).
Attention: To ensure proper system cooling, do not leave the top cover off the server for more than 2 minutes.
3. Open the fan-locking handle by sliding the orange release latch in the direction of the arrow.
4. Pull upward on the free end of the handle to lift the fan out of the server.



5. Open the locking handle on the replacement fan, lower the fan into its socket, and rotate the handle to the locked position.
6. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 35.

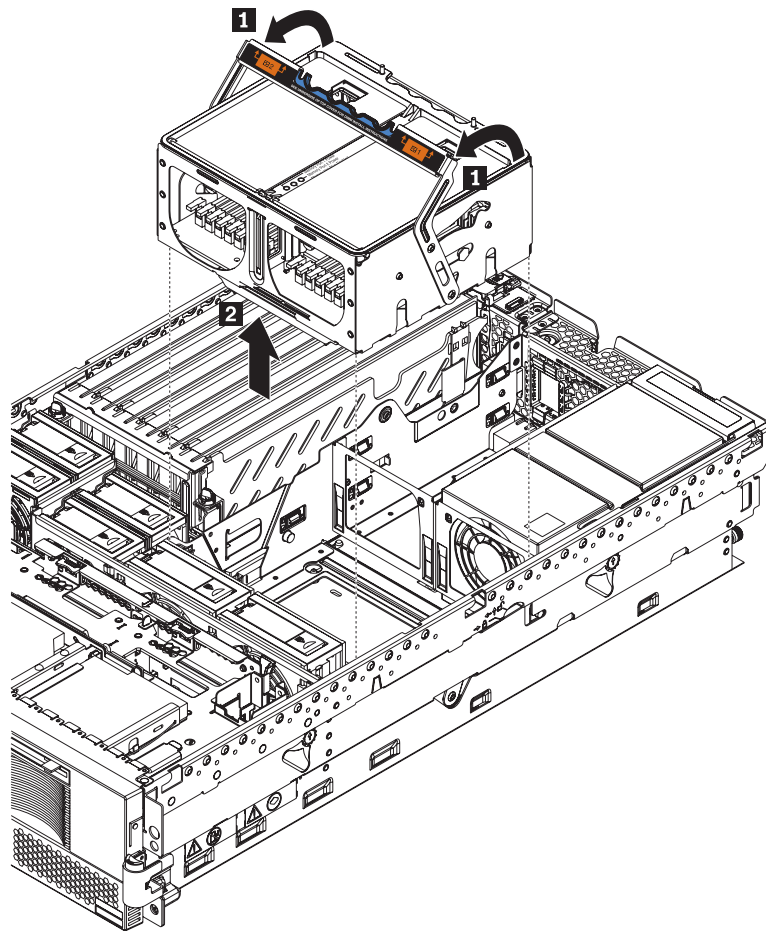
Replacing the memory cassette

The following notes describe information that you must consider when replacing the 8-DIMM-connector memory cassette in the server with a 16-DIMM-connector memory cassette:

- The memory cassette is not hot-swappable; you must turn off the server before replacing the memory cassette.
- For a server with an 8-DIMM-connector memory cassette, you can increase the memory capabilities of your server by upgrading to the 16-connector memory cassette. The 16-connector memory cassette supports memory mirroring and Memory ProteXion. See the ServerProven list at <http://www.ibm.com/pc/compat/> for a list of memory cassettes supported by the server.

Complete the following steps to replace the memory cassette in the server.

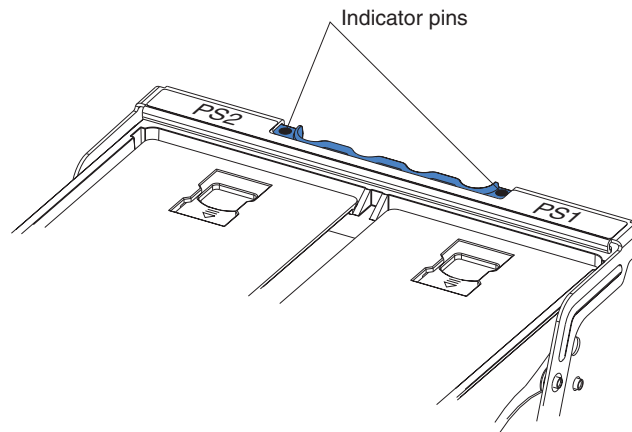
1. Review the safety information beginning on page v, and “Installation guidelines” on page 11.
2. Turn off the server and all peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server cover (see “Removing the cover and bezel” on page 13).
4. Remove the current memory cassette:



- a. Using both hands, pull the memory cassette locking handle in an arc toward the front of the server (**1**) until the memory cassette is released.
- b. Lift the memory cassette out of the server (**2**).

5. Install the new memory cassette in the server:
 - a. Pull the new memory cassette locking handle in an arc toward the front of the cassette.
 - b. Orient the cassette as shown in the illustration in step 4 on page 34; then, lower the cassette into place.
 - c. Using both hands, rotate the locking handle toward the rear of the server, making sure when you finish that the cassette is fully seated and the locking handle is all the way down.

Note: When the cassette is fully seated and the handle is all the way down, two black pins protrude through the blue insert on the handle.



6. Install DIMMs in the memory cassette; you can use the DIMMs from the previous memory cassette. See “Installing memory modules” on page 18 for the DIMM population order to use.

Note: Use the Configuration/Setup Utility program to enable or disable mirrored memory mode.

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

Completing the installation

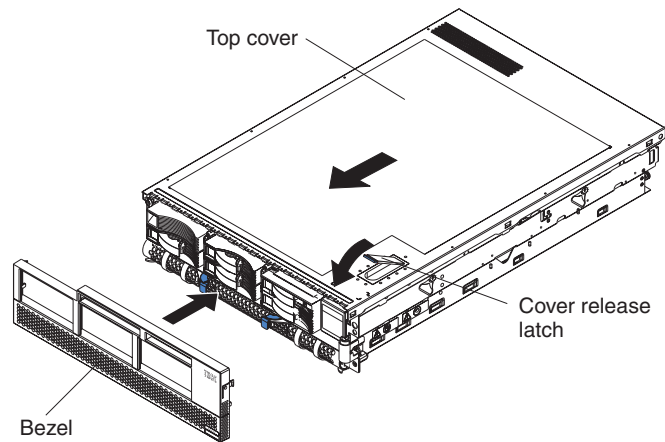
This section describes how to complete the installation.

Installing the cover and bezel

Complete the following steps to install the server cover and bezel:

1. Before installing the cover, check that all internal cables, adapters, and other components are installed and seated correctly and that you have not left loose tools or parts inside the server.

2. Move the cover-release latch to the open (up) position.



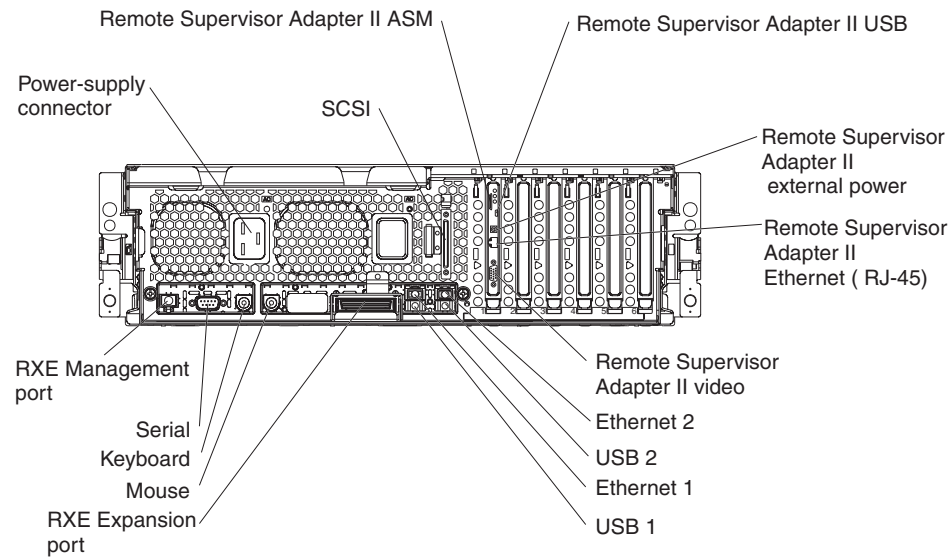
3. Insert the tabs on the cover into the matching slots in the server chassis.
4. Press down on the cover-release latch. The cover-release latch slides the cover forward into position and locks the cover in place.
5. Insert the tabs on the bottom of the bezel into the matching holes on the server chassis.
6. Push the top of the bezel toward the server until the two tabs at the top of the sides of the bezel snap into place. You might need to press the bezel side latches as you perform this step.
7. Slide the server fully into the rack cabinet.
8. If you disconnected any power cords or external cables from the server, reconnect the external cables first. If you are adding any new peripheral devices (see “Connecting the cables” for details), you can connect the external cables for those devices. Then, connect the power cords to properly grounded electrical outlets.

Note: Depending on the options that you installed, you might need to run the Configuration/Setup Utility program to update the server configuration. See the *User's Guide* for more information.

Connecting the cables

This section describes how to connect cables to the server, with particular instructions for the RXE Expansion Port, RXE Management Port, and Ethernet connectors. When instructed, see the applicable documentation for more details.

For details about the locations and functions of all of the ports, indicators, and connectors, see Chapter 3, “I/O connectors,” on page 41.

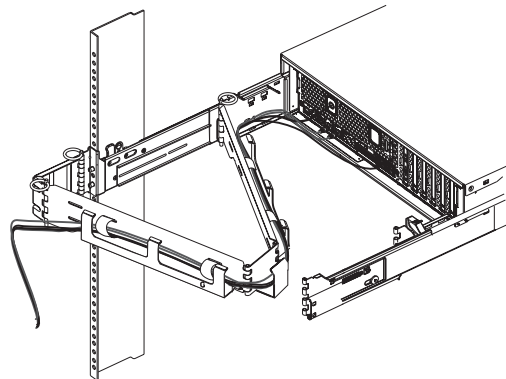


The following illustration shows the cable routing for a typical server configuration. Detailed cabling instructions, including the use of the cable management arm (shipped with the server) are in the *Rack Installation Instructions* provided with the server.

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

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

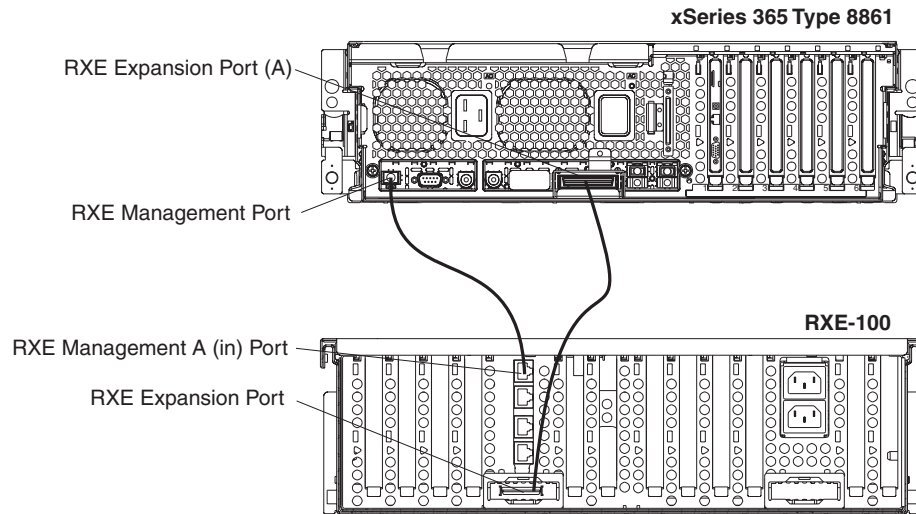
If you have just connected the power cords of the server to an electrical outlet, wait 20 seconds before pressing the power-control button.



RXE connector cabling

Your server has one RXE Expansion Port and one RXE Management Port located on the rear of the server. Use these connectors to connect the server to a remote I/O enclosure and to expand the number of PCI-X slots that are available for use by the server. For detailed information about cabling the RXE ports, see the documentation that comes with the remote I/O enclosure.

Complete the following steps to cable your server to a remote I/O enclosure.



1. Using an RXE Expansion cable, connect one end of the cable to the RXE Expansion Port on the server.
2. Connect the opposite end of the cable to an RXE Expansion Port on the remote I/O enclosure.
3. Using an RXE Management cable, connect one end of the cable to the RXE Management Port on the server.
4. Connect the opposite end of the cable to the RXE Management A (in) Port on the remote I/O enclosure.

Note: For details about cabling the server to the remote I/O enclosure and how the server and remote I/O work together, see the documentation that comes with the enclosure.

Gigabit Ethernet cabling

There are two Ethernet connectors on the back of the server. Use these connectors to connect the server to a LAN.

Note: Another Ethernet connector is located on the Remote Supervisor Adapter II. This port is used for specific supervisory functions and should not be confused with the Gigabit Ethernet connectors above the USB ports.

Updating the server configuration

When you start the server for the first time after you add or remove an internal option or external SCSI device, you might receive a message that the configuration has changed. The Configuration/Setup Utility program starts automatically so that you can save the new configuration settings. 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 on the system board. If more than one microprocessor is installed, 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.

For information about setting up, configuring, and using the Remote Supervisor Adapter II, see the *Remote Supervisor Adapter II User's Guide* on the IBM xSeries Documentation CD.

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

Chapter 3. I/O connectors

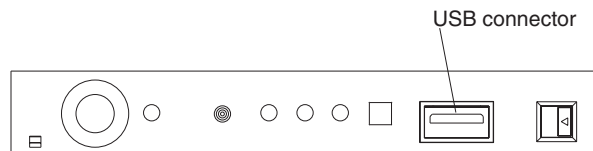
Your server has the following input/output (I/O) connectors:

- Serial (one, rear)
- Gigabit Ethernet (two, rear)
- Keyboard (one, rear)
- Mouse (one, rear)
- USB (two, rear; one, front - on operator information panel)
- RXE expansion (one, rear)
- RXE management (one, rear)
- SCSI (one, rear)

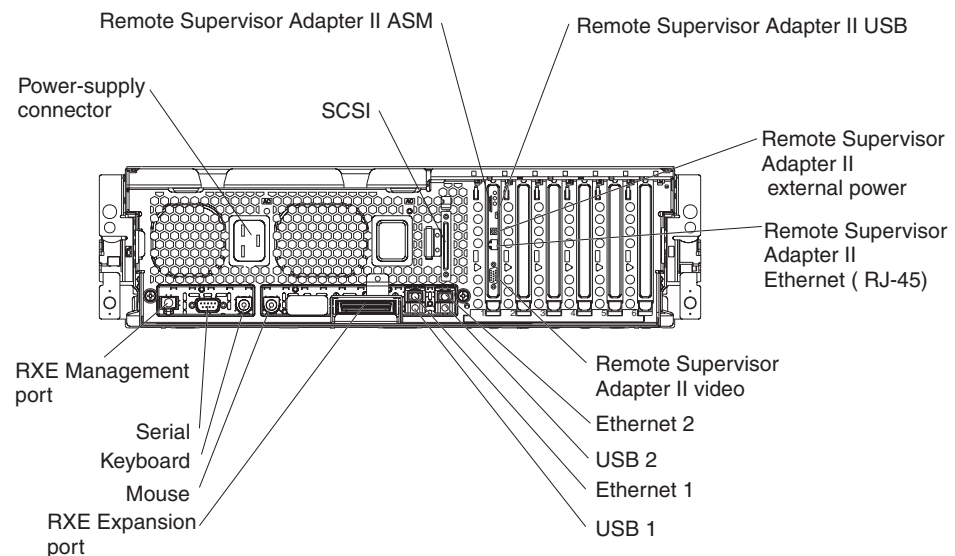
The Remote Supervisor Adapter II has the following connectors:

- Remote Supervisor Adapter II Ethernet (one, rear)
- Remote Supervisor Adapter II video (one, rear)
- Remote Supervisor Adapter II ASM (one, rear)
- Remote Supervisor Adapter II USB (reserved)

The following illustration shows the USB connector on the operator information panel on the front of the server.



The following illustration shows the I/O connectors on the rear of the server.



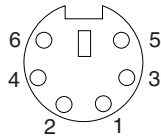
The following sections describe these connectors.

Server connectors

The following connectors are on the server.

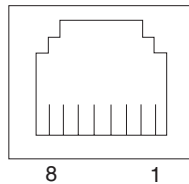
Auxiliary-device (pointing device) connector

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



Ethernet connector

The following illustration shows an Ethernet connector.

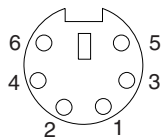


Connect a Category 3, 4, or 5 unshielded twisted-pair cable to this connector. The 100BASE-TX and 1000BASE-T Fast Ethernet standards require Category 5 or higher cabling.

For more information about the Ethernet controller, see the *User's Guide*.

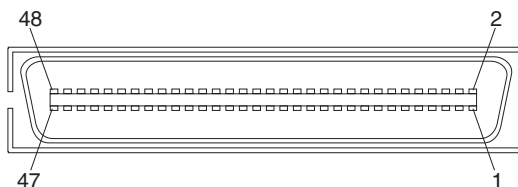
Keyboard connector

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



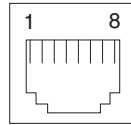
RXE Expansion Port connector

Use this connector to connect the server to the RXE Expansion port on an optional IBM RXE-100 Remote Expansion Enclosure. The following illustration shows an RXE Expansion Port connector.



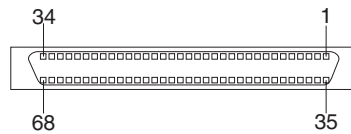
RXE Management Port connector

Use this connector to connect the server to the RXE Management A (In) Port on an optional IBM RXE-100 Remote Expansion Enclosure. The following illustration shows an RXE Management Port connector.



SCSI connector

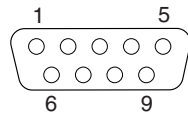
Use the external small computer system interface (SCSI) connector to connect an external SCSI device to channel B of the Ultra 320 SCSI controller in your server. The following illustration shows a 68-pin external SCSI connector.



See the information that comes with the device for instructions to set its SCSI ID. SCSI IDs for devices on channel B can be duplicates of the SCSI IDs on channel A.

Serial connector

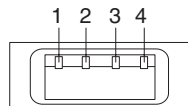
Use a serial connector to connect a serial device. The following illustration shows a serial connector.



Connect a serial cable to this port to enable system management through a modem, or connect a null modem cable to enable system management through a workstation or mobile computer.

Universal Serial Bus connector

Use a Universal Serial Bus (USB) connector to connect a USB device. USB technology transfers data at up to 12 Mb per second (Mbps) with a maximum of 127 devices and a maximum signal distance of 5 meters (16 ft) per segment. Using Plug and Play technology, USB devices are configured automatically. 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, USB ports and devices are 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.

Remote Supervisor Adapter II connectors

The following connectors are on the rear of the Remote Supervisor Adapter II:

Advanced System Management (ASM) connector

Connect the ASM breakout cable to this connector to enable system management through the serial connectors and through the ASM RS-485 connectors. See the *Remote Supervisor Adapter User's Guide* for more information about the breakout cable.

USB This connector is not available for use.

External power-supply connector

Connect the optional power-supply adapter to this connector. This connection provides power to the Remote Supervisor Adapter II, independent of the server power supply.

Ethernet (RJ-45) connector

Connect a Category 3, 4, or 5 unshielded twisted-pair cable to this connector to enable a LAN connection or Telnet session. The Ethernet connector LEDs on the Remote Supervisor Adapter II indicate whether the link is good and whether activity is taking place on the network.

Video connector

Connect the cable from the server monitor to this connector.

Attention: Do *not* connect the ASM connector to the RXE Management Port on the server.

If you want to use the Remote Supervisor Adapter II to manage the server remotely or to connect the server to another server, connect the applicable cables to the Remote Supervisor Adapter II connectors.

- To enable remote server management through a network, use the Remote Supervisor Adapter II Ethernet connector.
- To enable remote server management using a modem, use a Remote Supervisor Adapter II serial connector on the breakout cable that you connect to the ASM connector.
- To enable remote server management through a serial interface from a client workstation using a terminal-emulation program or from a hardware terminal server, connect the breakout cable to the ASM connector and make the following connections:
 - Use a null modem cable to connect your server serial connector to the serial connector labeled COM1 on the breakout cable.
 - Use a null modem cable to connect the serial connector labeled COM2 on the breakout cable to a terminal server or client serial connector.

See the Remote Supervisor Adapter II documentation on the IBM *xSeries Documentation* CD for more information.

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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.

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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.

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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. 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 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.

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

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Taiwanese Class A warning statement

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

Chinese Class A warning statement

聲 明
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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.

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For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 14 AWG, Type 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 14 AWG, Type 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.

Power cord rating	IBM power cord part number (2.5 m)	Used in these countries and regions
15 A/125 V ac	12J5112	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Columbia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States, Venezuela
15 A/250 V ac	12J5120	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Columbia, 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, Venezuela

Power cord rating	IBM power cord part number (2.5 m)	Used in these countries and regions
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16 A/250 V ac	36L8822	Denmark, Liechtenstein, Switzerland
16 A/250 V ac	12J5122	Israel
16 A/250 V ac	12J5126	Chile, Italy, Libyan Arab Jamahiriya
16 A/250 V ac	12J5124	Bangladesh, Lesotho, Macao, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda
13 A/250 V ac	12J5987	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, Cyprus, Dominica, Gambia, Ghana, Grenada, Guyana, Hong Kong, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Qatar, Saint Kitts & Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad & Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
15 A/250 V ac	12J5128	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea
15 A/250 V ac	01K9851	China
15 A/250 V ac	49P2114	Brazil
15 A/250 V ac	49P2082	India
15 A/250 V ac	36L8884	Argentina, Paraguay, Uruguay
15 A/125 V ac	01K9853	Japan

Index

A

- adapter
 - considerations 13
 - IXA 14
 - IXA jumper 14
- auxiliary-device connector 42

B

- battery, replacing 31
- bezel
 - installing 35
 - removing 13

C

- cable routing 41
- cabling
 - I/O board
 - external connectors 6
 - internal connectors 6
 - Remote Supervisor Adapter II 44
- CD-ROM drive, replacing 18
- Class A electronic emission notice 48
- components, major 1, 2
- connector
 - ASM 44
 - auxiliary-device 42
 - Ethernet 42, 44
 - external power supply 44
 - keyboard 42
 - pointing device 42
 - RXE Expansion Port 42
 - RXE Management Port 43
 - SCSI 43
 - USB 43
 - video 44
- connectors
 - Remote Supervisor Adapter II 44
- cover
 - installing 35
 - removing 13

D

- diskette drive, replacing 18
- drive
 - CD-ROM, replacing 18
 - diskette, replacing 18

E

- electronic emission Class A notice 48
- Ethernet connector 42

F

- fan, replacing 33
- FCC Class A notice 48

H

- hard disk drive
 - installing 17
 - types supported 17

I

- I/O board
 - jumpers 6
 - LEDs 6
 - Remote Supervisor Adapter II
 - cable connector 6
 - slot 14
- indicators, Light Path LEDs 9
- installation
 - completing 35
 - order, microprocessors 24
- installing
 - adapters 13
 - CD-ROM drive 18
 - hard disk drive 17
 - memory modules 18
 - microprocessor 22
 - power supply 29
- IXA adapter, installing 14
- IXA jumper 14

K

- keyboard connector 42

L

- LEDs
 - See also* Log
 - CPU 9
 - DASD 9
 - EXP 9
 - FAN 9
 - Light Path Diagnostics panel 9
 - MEM 9
 - NMI 9
 - Non Redund 9
 - Out of Spec 9
 - Over Temp 9
 - PCI 9
 - PS1 9
 - PS2 9
 - VRM 9

M

- memory
 - installing 18
 - order of installation 19
- memory cassette, replacing 34
- microprocessor
 - installing 22
 - order of installation 24
- microprocessor tray, reinstalling 29
- microprocessor tray, removing 24
- mouse (auxiliary-device) connector 42

N

- notes, important 46
- notices
 - attention 2
 - caution 2
 - danger 2
 - electronic emission 48
 - FCC, Class A 48
 - important 2
 - safety publication 2

O

- order of installation
 - memory 19
 - microprocessors 24

P

- pointing-device (auxiliary-device) connector 42
- port
 - See connector
- power
 - cords 49
 - supplies 29
- power supply
 - installing 29
 - LEDs 31

R

- related documents 1
- Remote Supervisor Adapter II
 - cable connector on I/O board 6
 - external connectors 44
- replacing CD-ROM drive 18
- RXE Expansion Port connector 42
- RXE Management Port connector 43

S

- SCSI IDs 17
- serial connector 43
- statements
 - attention 2
 - caution 2
 - danger 2

- statements (*continued*)
 - important 2

T

- trademarks 46

U

- United States electronic emission Class A notice 48
- United States FCC Class A notice 48
- Universal Serial Bus connector 43
- USB connector 43

V

- video connector 44

W

- Web site
 - server compatibility information 11
 - working inside server with power on 11



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