

System x3655 Type 7985



User's Guide

System x3655 Type 7985



User's Guide

Note:

Before using this information and the product it supports, be sure to read the general information in “Notices” on page 93.

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Contents

Safety	v
Chapter 1. The System x3655 Type 7985 server	1
Related documentation	2
Notices and statements in this document	3
Features and specifications	4
What your server offers	6
Reliability, availability, and serviceability features	8
IBM Director	9
The UpdateXpress program	9
Server controls, LEDs, and power	10
Front view	10
Rear view	12
Server power features	13
Chapter 2. Installing optional devices	15
Server components	15
System-board optional-device connectors	17
Riser-card optional-device connectors	18
System-board internal cable connectors	19
Power-backplane-card internal cable connectors	19
System-board external connectors	20
System-board jumpers	21
System-board LEDs	23
Installation guidelines	23
System reliability guidelines	24
Working inside the server with the power on	25
Handling static-sensitive devices	25
Removing the cover	26
Removing the riser-card assembly	26
Installing the riser-card assembly	28
Removing the air baffle	29
Installing the air baffle	30
Installing an adapter	31
Installing the external SAS cable	33
Installing the Remote Supervisor Adapter II SlimLine	35
Replacing the ServeRAID SAS controller	36
Installing a hard disk drive	38
Removing a hard disk drive	40
Installing an optional tape drive	41
Installing a SATA tape drive in a 3.5-inch model server	41
Installing a SATA tape drive in a 2.5-inch model server	43
Installing a SCSI tape drive in a 3.5-inch model server	44
Installing a SCSI tape drive in a 2.5-inch model server	48
Installing a microprocessor	51
Installing a memory module	54
Installing a hot-swap power supply	57
Installing a fan	59
Removing the fan-bracket assembly	60
Installing the CD/DVD drive	61
Completing the installation	61
Installing the cover	62
Connecting the cables	62

Updating the server configuration	63
Chapter 3. Configuring the server	65
Using the Configuration/Setup Utility program	66
Starting the Configuration/Setup Utility program	66
Configuration/Setup Utility menu choices	66
Passwords	69
Using the ServerGuide Setup and Installation CD	71
ServerGuide features	72
Setup and configuration overview	72
Typical operating-system installation	73
Installing your operating system without ServerGuide	73
Using the IBM ServeRAID Configuration Utility program	73
Starting the IBM ServeRAID Configuration Utility menu choices	74
IBM ServeRAID Configuration Utility menu choices	74
Using ServeRAID Manager	75
Configuring the RAID controller	75
Viewing the configuration	76
Using the baseboard management controller	76
Enabling and configuring SOL using the OSA SMBridge management utility program	77
Installing the OSA SMBridge management utility program	85
Using the baseboard management controller utility programs	87
Configuring the Gigabit Ethernet controllers	88
Updating IBM Director	89
Setting up a Remote Supervisor Adapter II SlimLine	89
Requirements	90
Cabling the Remote Supervisor Adapter II SlimLine	90
Installing the Remote Supervisor Adapter II SlimLine firmware	90
Completing the setup	91
Notices	93
Trademarks	93
Important notes.	94
Product recycling and disposal	95
Battery return program	96
Electronic emission notices	97
Federal Communications Commission (FCC) statement	97
Industry Canada Class A emission compliance statement	97
Australia and New Zealand Class A statement	97
United Kingdom telecommunications safety requirement.	97
European Union EMC Directive conformance statement.	98
Taiwanese Class A warning statement	98
Chinese Class A warning statement	98
Japanese Voluntary Control Council for Interference (VCCI) statement	98
Index	99

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* 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 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

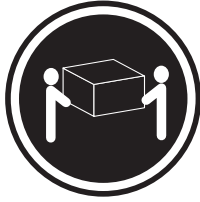
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

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

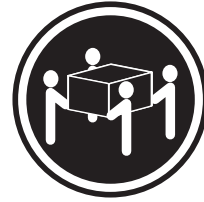
Statement 4:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

CAUTION:

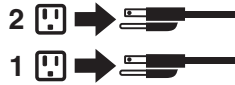
Use safe practices when lifting.

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 26:



CAUTION:

Do not place any object on top of rack-mounted devices.



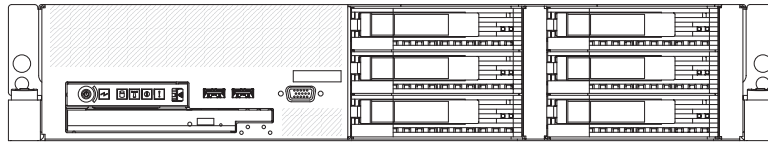
Attention: This server is suitable for use on an IT power distribution system whose maximum phase-to-phase voltage is 240 V under any distribution fault condition.

Chapter 1. The System x3655 Type 7985 server

The IBM® System x3655 Type 7985 server is a 2-U¹ -high server that is ideally suited for networking environments that require superior microprocessor performance, efficient memory management, and flexibility. The server can be upgraded to a symmetric multiprocessing (SMP) server through the addition of an optional microprocessor.

The server has two model styles, which are based on the size and number of hard disk drive bays:

- The *3.5-inch* models have six 3.5-inch hot-swap hard disk drive bays. Install only 3.5-inch drives in these models. If you install an optional tape drive, the tape drive occupies two of the six 3.5-inch drive bays.



- The *2.5-inch* models have eight 2.5-inch hot-swap hard disk drive bays and one 3.5-inch tape drive bay. Install only 2.5-inch hard disk drives and an optional 3.5-inch tape drive in these models.



Throughout this documentation, the terms *2.5-inch models* and *3.5-inch models* are used to distinguish between the server styles.

Performance, ease of use, reliability, and expansion capabilities were key considerations in the design of the server. These design features make it possible for you to customize the system hardware to meet your needs today and provide flexible expansion capabilities for the future.

The server comes with a limited warranty. For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

The server contains IBM Enterprise X-Architecture™ technologies, which help increase performance and reliability. For more information, see “What your server offers” on page 6 and “Reliability, availability, and serviceability features” on page 8.

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

1. Racks are measured in vertical increments of 1.75 inches each. Each increment is called a “U.” A 1-U-high device is 1.75 inches tall.

Related documentation

This *User's Guide* contains general information about the server, including how to install supported optional devices and how to configure the server. The following documentation also comes with the server:

- *Installation Guide*

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

- *Warranty and Support Information*

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

- *Safety Information*

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

- *Rack Installation Instructions*

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

- *Problem Determination and Service Guide*

This document is in PDF on the *IBM System x 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 System x Documentation* CD.

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

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

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

1. Go to <http://www.ibm.com/servers/eserver/support/xseries/index.html>.
2. From the **Hardware** list, select **System x3655** and click **Go**.
3. Click the **Install and use** tab.
4. Click **Product Documentation**.

Notices and statements in this document

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

The following notices and statements are used in this document:

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

Features and specifications

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

Racks are marked in vertical increments of 4.45 cm (1.75 inches). Each increment is referred to as a unit, or “U.”

Table 1. Features and specifications

<p>Microprocessor:</p> <ul style="list-style-type: none"> • AMD Opteron dual-core with 2 MB (1 MB per core) Level-2 cache • 1 GHz Hypertransport interconnect bus • Support for up to two microprocessors <p>Note: Use the Configuration/Setup Utility program to determine the type and speed of the microprocessors.</p> <p>Memory:</p> <ul style="list-style-type: none"> • Sixteen DIMM connectors • Minimum: 1 GB • Maximum: 64 GB • Type: Registered PC2-5300 double data rate (DDR) II DIMMs • Sizes: 512 MB, 1 GB, 2 GB, or 4 GB, in pairs <p>Drives: (depending on your model)</p> <ul style="list-style-type: none"> • Hard disk drive: SAS or SATA • One of the following IDE drives: <ul style="list-style-type: none"> – DVD-ROM – CD-RW/DVD-ROM combination <p>Expansion bays:</p> <ul style="list-style-type: none"> • Hot-swap hard disk drive bays: One of the following configurations: <ul style="list-style-type: none"> – Six 3.5-inch drive bays (optional tape drive will require two of these bays) – Eight 2.5-inch drive bays and one tape drive bay • One 5.25-inch Ultrabay Enhanced bay (CD-RW/DVD drive installed) <p>Expansion slots:</p> <ul style="list-style-type: none"> • Three low-profile PCI Express slots (two x8 and one x4 lanes) on system board • Support for one of the following riser cards: <ul style="list-style-type: none"> – HTX riser card with a full height, full length HTX adapter slot (standard) (25 W max.) – PCI Express riser card with one full height, full length adapter slot (x16 lanes) (25 W max.) (optional) – PCI-X riser card with one full height, full length, 133 MHz/64-bit adapter slot (optional) <p>Hot-swap fans:</p> <ul style="list-style-type: none"> • Standard: Five • Maximum: Ten - provide redundant cooling 	<p>Hot-swap power supplies:</p> <p>835 watts (100 - 240 V ac)</p> <ul style="list-style-type: none"> • Minimum: One • Maximum: Two - provide redundant power <p>Size (2 U):</p> <ul style="list-style-type: none"> • Height: 85.4 mm (3.36 in.) • Depth: 705 mm (27.8 in.) • Width: 443.6 mm (17.5 in.) • Weight: approximately 21.09 kg (46.5 lb) to 29.03 kg (64 lb) depending upon configuration <p>Integrated functions:</p> <ul style="list-style-type: none"> • Baseboard management controller (on-board service processor) • Two Broadcom 10/100/1000 Ethernet controllers with Wake on LAN® support and TCPIP Offload Engine (TOE) support • One serial port • One serial-attached SCSI (SAS) controller • Six Universal Serial Bus (USB) ports (2.0) <ul style="list-style-type: none"> – two on the front of the server – four on the rear of the server • Two video ports <ul style="list-style-type: none"> – one on the front of the server – one on the rear of the server • Support for Remote Supervisor Adapter II SlimLine <p>Video controller:</p> <ul style="list-style-type: none"> • ATI RN50 video on system board • Compatible with SVGA and VGA • 16 MB DDR1 video memory <p>RAID controller:</p> <ul style="list-style-type: none"> • ServeRAID™-8k-I SAS Controller, 256 MB, that supports RAID levels 0, 1, 10 (standard) • Upgradable to ServeRAID-8k SAS Controller, 512 MB with battery backup, that supports additional RAID levels <p>Acoustical noise emissions:</p> <ul style="list-style-type: none"> • Declared sound power, idle: 6.8 bel • Declared sound power, operating: 6.8 bel 	<p>Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Server on: 10° to 35°C (50.0° to 95.0°F); altitude: 0 to 914.4 m (3000 ft). Decrease system temperature by 0.75°C for every 1000-foot increase in altitude. – Server off: 10° to 43°C (50.0° to 109.4°F); maximum altitude: 2133 m (7000 ft) – Shipment: -40° to +60°C (-40° to 140°F); maximum altitude: 2133 m (7000 ft) • Humidity: <ul style="list-style-type: none"> – Server on/off: 8% to 80% – Shipment: 5% to 100% <p>Heat output:</p> <p>Approximate heat output in British thermal units (Btu) per hour:</p> <ul style="list-style-type: none"> • Minimum configuration: 1230 Btu (360 watts) • Maximum configuration: 2840 Btu (830 watts) <p>Electrical input:</p> <ul style="list-style-type: none"> • Sine-wave input (50-60 Hz) required • Input voltage range automatically selected • Input voltage low range: <ul style="list-style-type: none"> – Minimum: 100 V ac – Maximum: 127 V ac • Input voltage high range: <ul style="list-style-type: none"> – Minimum: 200 V ac – Maximum: 240 V ac • Input kilovolt-amperes (kVA) approximately: <ul style="list-style-type: none"> – Minimum: 0.36 kVA – Maximum 0.93kVA <p>Notes:</p> <ol style="list-style-type: none"> 1. Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use 2. These levels were measured in controlled environments according to the procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779 and are reported in accordance with ISO average values stated because of room reflections and other nearby noise sources. The declared sound-power levels indicate an upper limit, below which a large number of computers will operate.
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What your server offers

The server uses the following features and technologies:

- **Baseboard management controller**

The baseboard management controller provides basic service-processor environmental monitoring functions. If an environmental condition exceeds a threshold or if a system component fails, the baseboard management controller lights LEDs to help you diagnose the problem.

The baseboard management controller also provides remote server management capabilities through the OSA SMBridge management utility program.

- **IBM Director**

IBM Director is a workgroup-hardware-management tool that you can use to centrally manage System x and xSeries servers. For more information, see the IBM Director documentation on the *IBM Director CD*.

- **IBM Enterprise X-Architecture technology**

IBM X-Architecture technology combines proven, innovative IBM designs to make your AMD-processor-based server powerful, scalable, and reliable. For more information, see <http://www.ibm.com/servers/eserver/xseries/xarchitecture/enterprise.html>.

- **Active™ Memory**

The Active Memory feature improves the reliability of memory through online-spare memory. Online-spare memory disables a failed pair of DIMMs from the system configuration and activates a pair of online-spare memory DIMMs. For more information, see “Installing a memory module” on page 54.

- **Large system-memory capacity**

The server supports up to 64 GB of system memory. The memory controller supports up to 16 industry-standard, x4 or x8, Registered, DDR 2 PC2-5300 dual inline memory modules (DIMMs).

- **IBM ServerGuide™ Setup and Installation CD**

The *ServerGuide Setup and Installation CD* that comes with the server provides programs to help you set up the server and install a Windows® operating system. The ServerGuide program detects installed hardware devices and provides the correct configuration programs and device drivers. For more information about the *ServerGuide Setup and Installation CD*, see “Using the ServerGuide Setup and Installation CD” on page 71.

- **Integrated network support**

The server comes with two integrated Broadcom Gigabit Ethernet controllers, that support connection to a 10-Mbps, 100-Mbps, or 1000-Mbps network. For more information, see “Configuring the Gigabit Ethernet controllers” on page 88.

- **Large data-storage and hot-swap capability**

The 3.5-inch model server supports up to six slim, 3.5-inch hot-swap hard disk drives in the hot-swap bays. The 2.5-inch model server supports up to eight 2.5-inch hot-swap hard disk drives in the hot-swap bays. With the hot-swap feature, you can add, remove, or replace hard disk drives without turning off the server.

- **Light path diagnostics**

Light path diagnostics provides LEDs to help you diagnose problems. For more information, see the section about light path diagnostics in the *Problem Determination and Service Guide*.

- **Online-spare memory**

Online-spare memory disables a failed pair of DIMMs from the system configuration and activates an online-spare pair of DIMMs to replace the failed pair. Before you can enable this feature, you must install an additional pair of DIMMs of the same speed, type, size (or larger), and technology as the failed pair of DIMMs. For more information see “Installing a memory module” on page 54

- **PCI Express adapter capabilities**

The server has three slots for low-profile PCI Express adapters (two x8 and one x4). The x8 slots accept a x4 adapter.

The server also has one full-height, full-length slot on the riser-card assembly for an optional PCI Express x16 adapter or an optional PCI-X 133 MHz adapter.

- **HTX adapter capabilities**

The server supports an HTX adapter slot on the riser-card assembly. You can replace the HTX adapter slot with an optional PCI-X 133 MHz riser-card adapter or PCI Express x16 riser-card assembly.

- **Power Executive**

Power Executive is an IBM Director extension that measures and reports server power consumption as it occurs. This enables you to monitor power consumption in correlation to specific software application programs and hardware configurations. You can obtain the measurement values through the systems-management interface, and can view them using IBM Director. For more information, including the required level of IBM Director and PowerExecutive, see the IBM Director documentation on the IBM Director CD, or see www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/extensions.

- **Redundant connection**

The addition of an optional network interface card (NIC) provides a failover capability to a redundant Ethernet connection. If a problem occurs with the primary Ethernet connection, all Ethernet traffic that is associated with the primary connection is automatically switched to the redundant NIC. If the applicable device drivers are installed, this switching occurs without data loss and without user intervention.

- **Redundant cooling and power capabilities**

The server supports up to 10 hot-swap fans, in multiples of 5, which provide redundant cooling. Redundant cooling enables continued operation if one of the fans fails. The server supports up to two 835-watt power supplies, which provide redundancy and hot-swap capability for a typical configuration. When the maximum load on the server is less than 835 watts and a problem occurs with one of the power supplies, the other power supply can meet the power requirements.

- **ServeRAID support**

The server supports an internal ServeRAID-8k or 8k-I SAS Controller, which is required for you to use the hot-swap hard disk drives and to create redundant array of independent disks (RAID) configurations.

- **Systems-management capabilities**

The server supports an optional Remote Supervisor Adapter II SlimLine which provides service-processor functions in addition to those that the BMC provides. When this adapter is used with the systems-management software that comes with the server, you can manage the functions of the server locally and remotely. The Remote Supervisor Adapter II SlimLine also provides system monitoring, event recording, and dial-out alert capability.

Reliability, availability, and serviceability features

Three important computer design features are reliability, availability, and serviceability (RAS). The RAS features help to ensure the integrity of the data that is stored in the server, the availability of the server when you need it, and the ease with which you can diagnose and repair problems.

The server has the following RAS features:

- Automatic error retry and recovery
- Automatic restart after a power failure
- Backup basic input/output system (BIOS) switching under the control of the baseboard management controller
- Baseboard management controller (service processor)
- Built-in monitoring for fan, power, temperature, voltage, and power-supply redundancy
- Cable-presence detection on most connectors
- Error codes and messages
- Error correcting code (ECC) L2 cache and system memory
- Registered DDR2 DIMMs support
- Hot-swap cooling fans with speed-sensing capability
- Hot-swap hard disk drives
- Hot-spare memory
- Information and light path diagnostics LED panels
- Menu-driven setup, system configuration, and redundant array of independent disks (RAID) configuration programs
- Parity checking or CRC checking on the serially-attached SCSI (SAS) bus and PCI buses
- Power management: Compliance with Advanced Configuration and Power Interface (ACPI)
- Power-on self-test (POST)
- Predictive Failure Analysis® (PFA) alerts
- Redundant Ethernet capabilities with failover support
- Redundant hot-swap power supplies and redundant hot-swap fans
- Remind button to temporarily turn off the system-error LED
- Remote system problem-determination support
- Standby voltage for system-management features and monitoring
- Startup (boot) from LAN through Preboot Execution Environment (PXE) boot agent utility or dynamic host configuration protocol/boot protocol (DHCP/BOOTP)
- System auto-configuring from the configuration menu
- System error logging (POST and service processor)
- System-management monitoring
- Upgradeable POST, BIOS, diagnostics, service processor microcode, and read-only memory (ROM) resident code, locally or over the LAN
- Vital product data (VPD) on microprocessors, system board, power supplies, memory, SAS backplane, and power backplane
- Wake on LAN capability

IBM Director

With IBM Director, a network administrator can perform the following tasks:

- View the hardware configuration of remote systems, in detail
- Monitor the usage and performance of critical components, such as microprocessors, disks, and memory
- Centrally manage individual or large groups of IBM and non-IBM AMD-processor-based servers, desktop computers, workstations, and mobile computers on a variety of platforms

IBM Director provides a comprehensive entry-level workgroup hardware manager. It includes the following key features:

- Advanced self-management capabilities for maximum system availability
- Multiple operating-system platform support, including Microsoft® Windows 2000 Server, Windows Server 2003, Windows XP Professional, AIX, i5/OS, Red Hat Linux, SUSE Linux, VMware, and Novell NetWare. For a complete list of operating systems that support IBM Director, see the IBM Director Compatibility Document. This document is in Portable Document Format (PDF) at <http://www.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-61788>. It is updated every 6 to 8 weeks.
- Support for IBM and non-IBM servers, desktop computers, workstations, and mobile computers
- Support for systems-management industry standards
- Integration into leading workgroup and enterprise systems-management environments
- Ease of use, training, and setup

IBM Director also provides an extensible platform that supports advanced server tools that are designed to reduce the total cost of managing and supporting networked systems. By deploying IBM Director, you can achieve reductions in ownership costs through the following benefits:

- Reduced downtime
- Increased productivity of IT personnel and users
- Reduced service and support costs

For more information about IBM Director, see the documentation on the *IBM Director* CD that comes with the server, the IBM Director Information Center at http://publib.boulder.ibm.com/infocenter/eserver/v1r2/topic/dirinfo/fqm0_main.html, and the IBM System x and xSeries Systems Management Web page at http://www.ibm.com/servers/eserver/xseries/systems_management/, which presents an overview of IBM Systems Management and IBM Director.

The UpdateXpress program

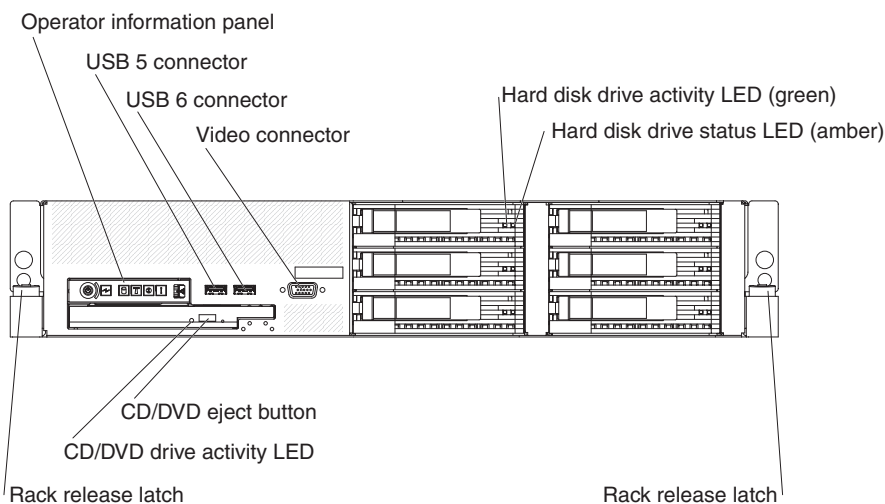
The UpdateXpress program is available for most System x and xSeries servers and server optional devices. It detects supported and installed device drivers and firmware in the server and installs available updates. You can download the UpdateXpress program from the Web at no additional cost, or you can purchase it on a CD. To download the program or purchase the CD, go to http://www.ibm.com/servers/eserver/xseries/systems_management/sys_migration/xpress.html.

Server controls, LEDs, and power

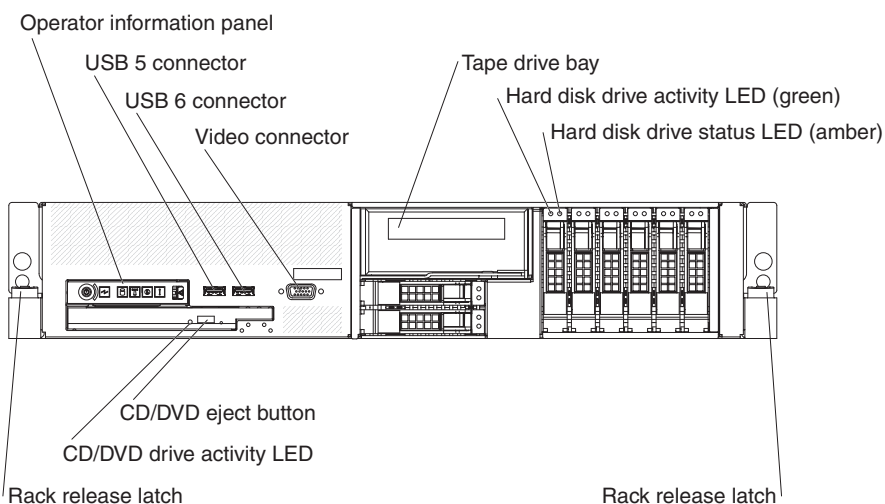
This section describes the controls and light-emitting diodes (LEDs) and how to turn the server on and off.

Front view

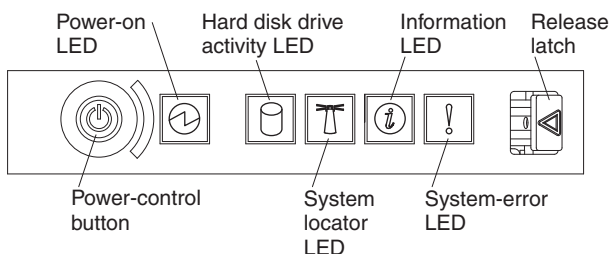
The following illustration shows the controls, light-emitting diodes (LEDs), and connectors on the front of the 3.5-inch model server.



The following illustration shows the controls, light-emitting diodes (LEDs), and connectors on the front of the 2.5-inch model server.



Operator information panel: The following illustration shows the controls, LEDs, and connectors on the operator information panel.



The following controls, LEDs, and connectors are on the operator information panel:

- **Power-control button:** Press this button to turn the server on and off manually. A power-control-button shield comes installed on the server to prevent the server from being turned off accidentally.
- **Power-on LED:** When this LED is lit and not flashing, it indicates that the server is turned on. When this LED is flashing, it indicates that the server is turned off and is still connected to an ac power source. When this LED is off, it indicates that ac power is not present, or the power supply or the LED itself has failed.

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

- **Hard drive activity LED:** When this LED is flashing, it indicates that a hard disk drive is in use.
- **System-locator LED:** Use this LED to visually locate the server among other servers. You can use IBM Director to light this LED remotely.
- **Information LED:** When this LED is lit, it indicates that a noncritical event has occurred. An LED on the light path diagnostics panel is also lit to help isolate the error.
- **System-error LED:** When this LED is lit, it indicates that a system error has occurred. An LED on the light path diagnostics panel is also lit to help isolate the error.
- **Release latch:** Slide this latch to the left to access the light path diagnostics panel.

USB connectors: Connect a USB device, such as USB mouse, keyboard, or other USB device, to either of these connectors.

Video connector: Connect a monitor to this connector.

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

Hard disk drive status LED: On some server models, each hot-swap hard disk drive has a status LED. When this LED is lit, it indicates that the drive has failed. When this LED is flashing slowly (one flash per second), it indicates that the drive is being rebuilt as part of a RAID configuration. When the LED is flashing rapidly (three flashes per second), it indicates that the controller is identifying the drive.

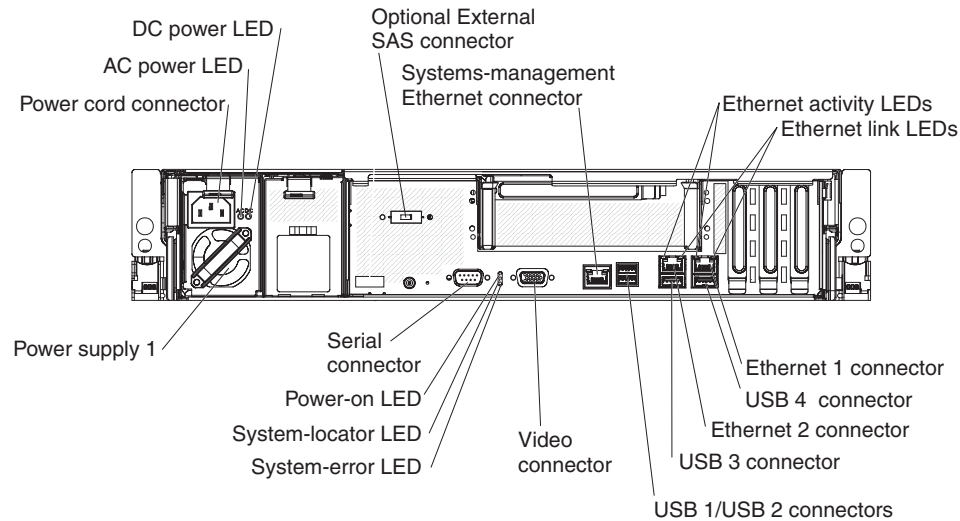
CD/DVD-eject button: Press this button to release a CD or DVD from the CD-RW/DVD drive.

CD/DVD drive activity LED: When this LED is lit, it indicates that the CD-RW/DVD drive is in use.

Rack release latches: Press these latches to release the server from the rack.

Rear view

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



Power-cord connector: Connect the power cord to this connector.

AC power LED: Each hot-swap power supply has an ac power LED and a dc power LED. When the ac power LED is lit, it indicates that sufficient power is coming into the power supply through the power cord. During typical operation, both the ac and dc power LEDs are lit. For any other combination of LEDs, see the *Problem Determination and Service Guide* on the IBM System x Documentation CD.

DC power LED: Each hot-swap power supply has a dc power LED and an ac power LED. When the dc power LED is lit, it indicates that the power supply is supplying adequate DC power to the system. During typical operation, both the ac and dc power LEDs are lit. For any other combination of LEDs, see the *Problem Determination and Service Guide* on the IBM System x Documentation CD.

System-management Ethernet connector: Use this connector to connect the server to a network for systems-management information control. This connector is active only if you have installed a Remote Supervisor Adapter II SlimLine, and is used only by the Remote Supervisor Adapter II SlimLine.

Ethernet activity LEDs: When these LEDs are lit, they indicate that the server is transmitting to or receiving signals from the Ethernet LAN that is connected to the Ethernet port.

Ethernet link LEDs: When these LEDs are lit, they indicate that there is an active link connection on the 10BASE-T, 100BASE-TX, or 1000BASE-TX interface for the Ethernet port.

Ethernet connectors: Use either of these connectors to connect the server to a network.

USB connectors: Connect a USB device, such as USB mouse, keyboard, or other USB device, to any of these connectors.

Video connector: Connect a monitor to this connector.

System-error LED: When this LED is lit, it indicates that a system error has occurred. An LED on the light path diagnostics panel is also lit to help isolate the error.

System-locator LED: Use this LED to visually locate the server among other servers. You can use IBM Director to light this LED remotely.

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

Serial connector: Connect a 9-pin serial device to this connector. The serial port is shared with the baseboard management controller (BMC). The BMC can take control of the shared serial port to perform text console redirection and to redirect serial traffic using Serial over LAN (SOL).

SAS connector: Connect a serial-attached SCSI (SAS) device to this connector.

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 service processor (the baseboard management controller or optional Remote Supervisor Adapter II SlimLine) 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

Approximately 5 seconds after the server is connected to ac power, the power-control button becomes active, and one or more fans might start running to provide cooling while the server is connected to power. You can turn on the server and start the operating system by pressing the power-control button.

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

- If a power failure occurs while the server is turned on, the server will restart automatically when power is restored.
- If your operating system supports the Wake on LAN feature, the Wake on LAN feature can turn on the server.

Note: When 4 GB or more of memory (physical or logical) is installed, some memory is reserved for various system resources and is unavailable to the operating system. The amount of memory that is reserved for system resources depends on the operating system, the configuration of the server, and the configured PCI optional devices.

Turning off the server

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

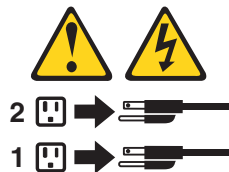
Some operating systems require an orderly shutdown before you turn off the server. See your operating-system documentation for information about shutting down the operating system.

Statement 5:



CAUTION:

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



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

- You can turn off the server from the operating system, if your operating system supports this feature. After an orderly shutdown of the operating system, the server will be turned off automatically.
- You can press the power-control button to start an orderly shutdown of the operating system and turn off the server, if your operating system supports this feature.
- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the server.
- The service processor 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.

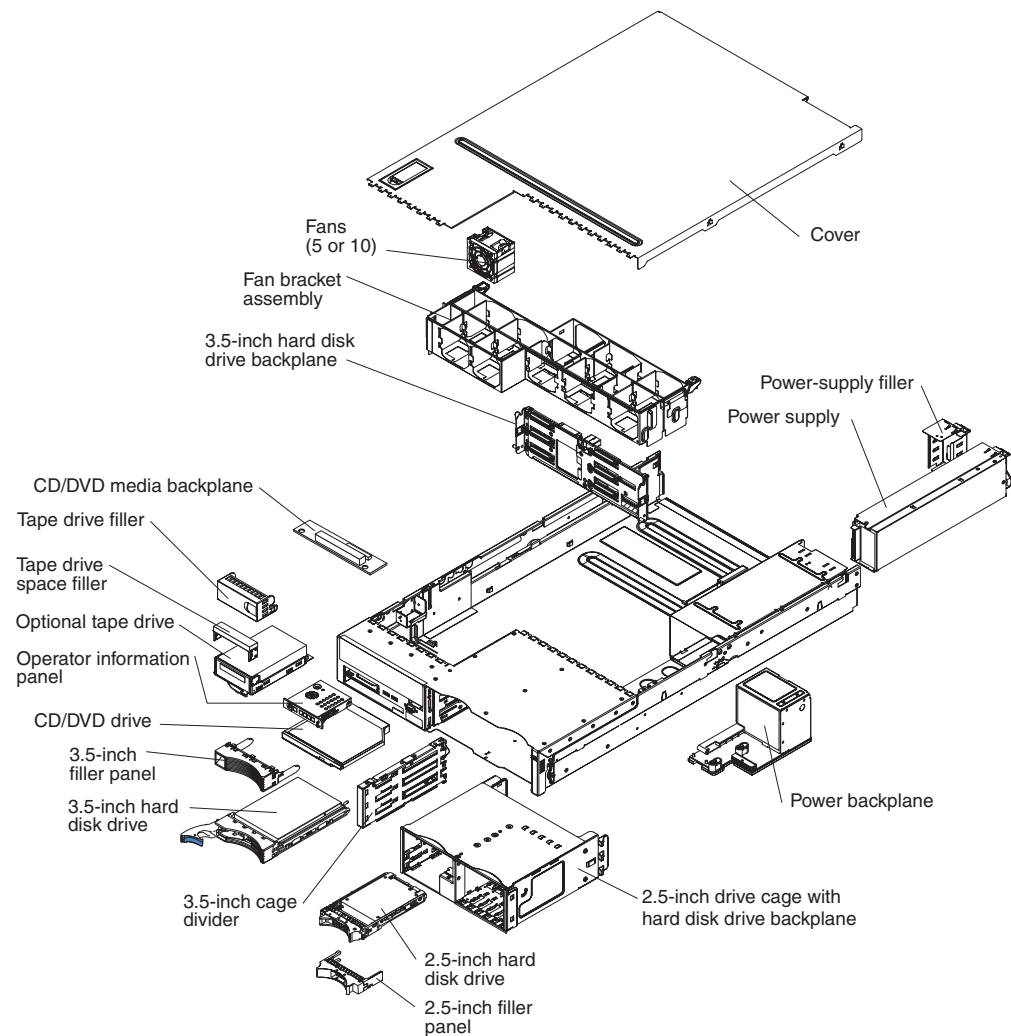
Chapter 2. Installing optional devices

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

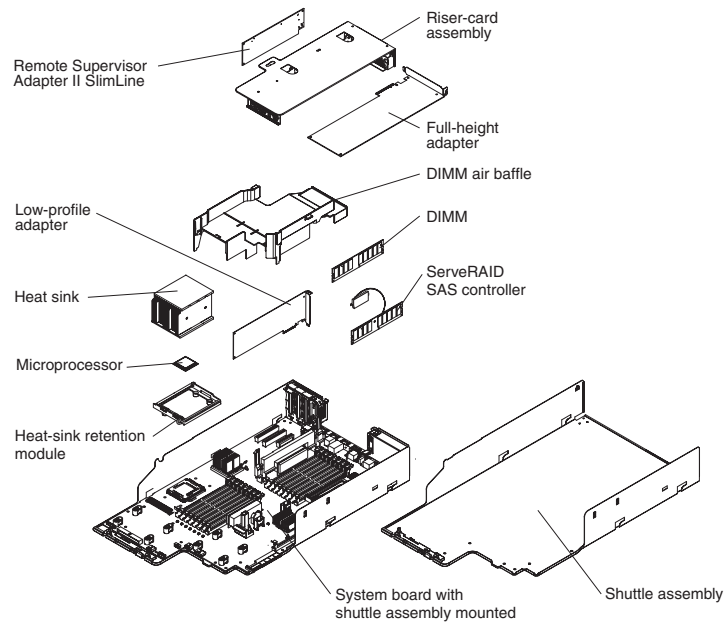
Server components

The following illustration shows the major components in the server. The illustrations in this document might differ slightly from your hardware.

View 1

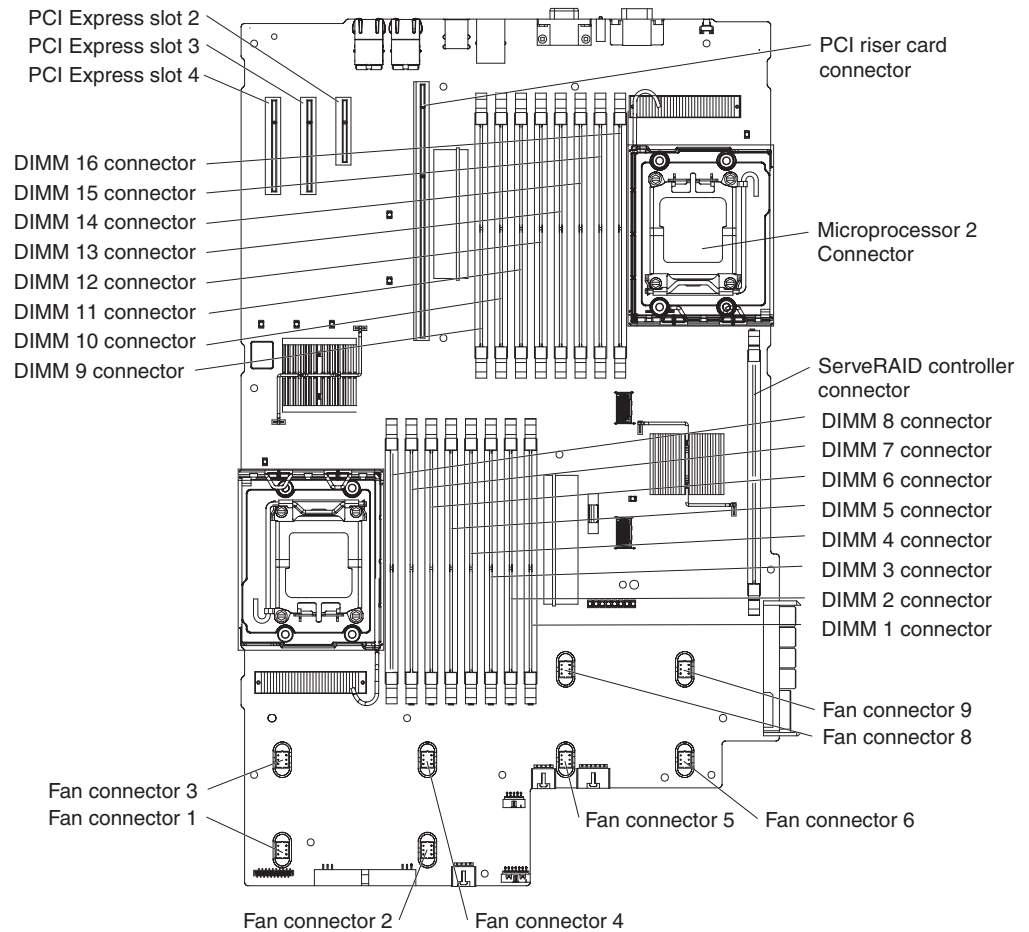


View 2



System-board optional-device connectors

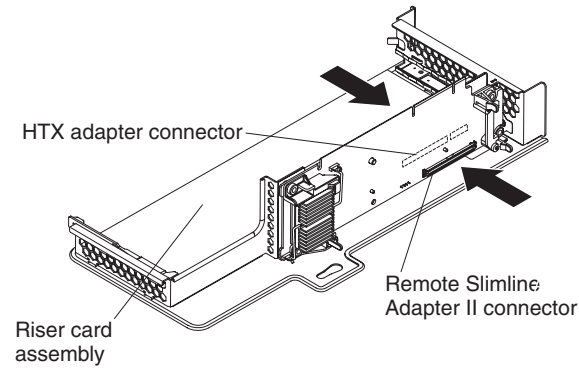
The following illustration shows the connectors on the system board for user-installable optional devices.



Riser-card optional-device connectors

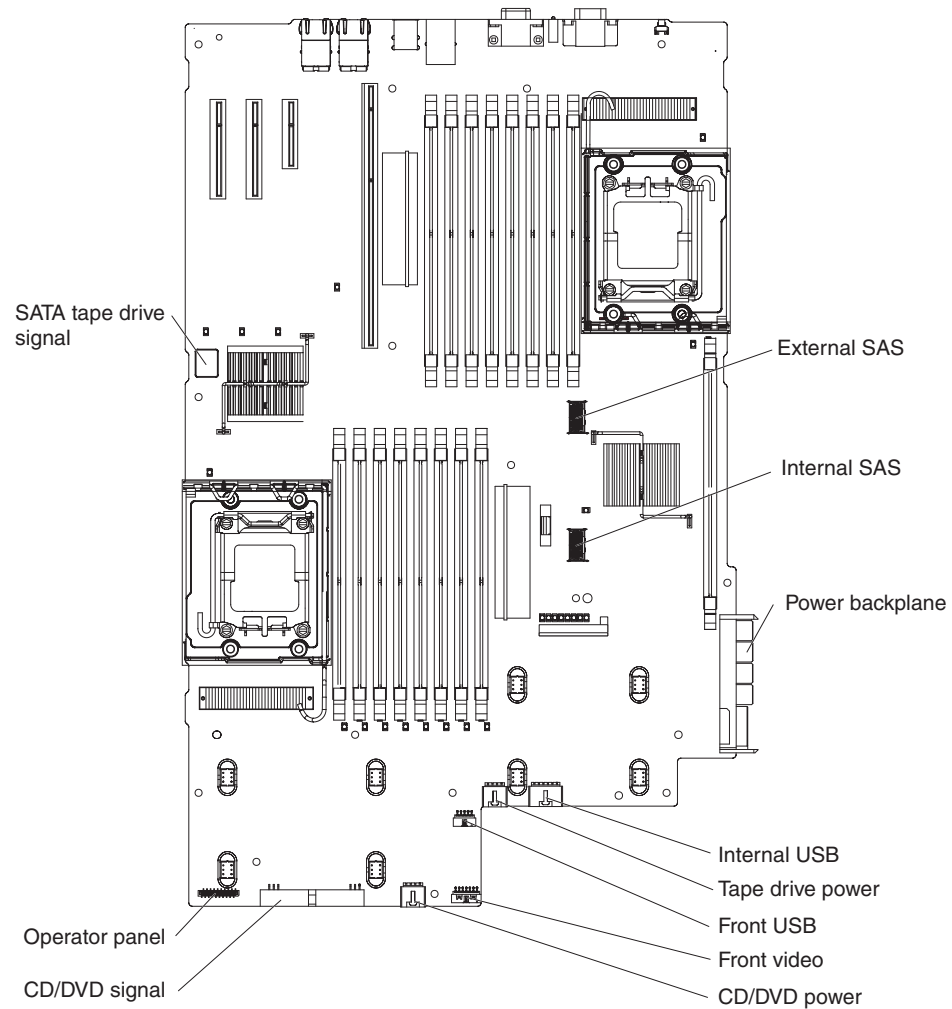
The following illustration shows the connectors on the riser-card assembly for user-installable optional devices.

Note: For clarity, in the following illustration, the riser card assembly is inverted.



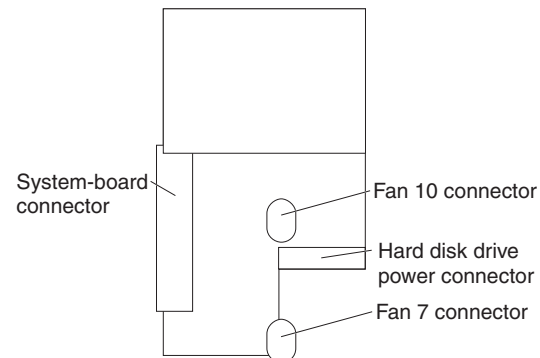
System-board internal cable connectors

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



Power-backplane-card internal cable connectors

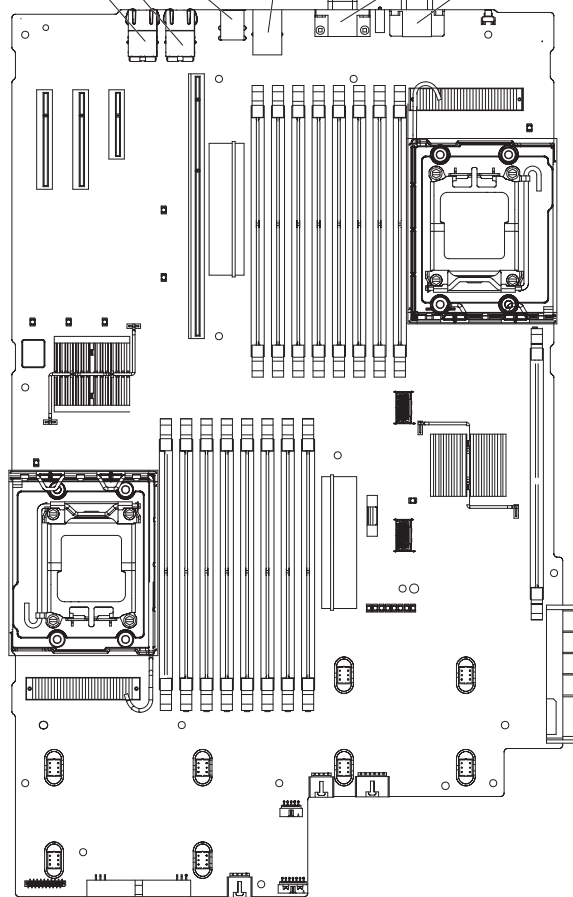
The following illustration shows the internal connectors on the power-backplane card.



System-board external connectors

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

USB 1/USB 2 connectors
Ethernet 2/USB 3 connectors
Ethernet 1/USB 4 connectors
Systems-management Ethernet connector
Video connector
Serial connector



System-board jumpers

The following illustration shows the jumpers on the system board.

Any jumpers on the system board that are not shown in the illustration are reserved. See the section about recovering the basic input/output system (BIOS) code in the *Problem Determination and Service Guide* on the IBM Documentation CD for information about using the BIOS recovery jumper.

Table 2 describes the function of each jumper on the system board.

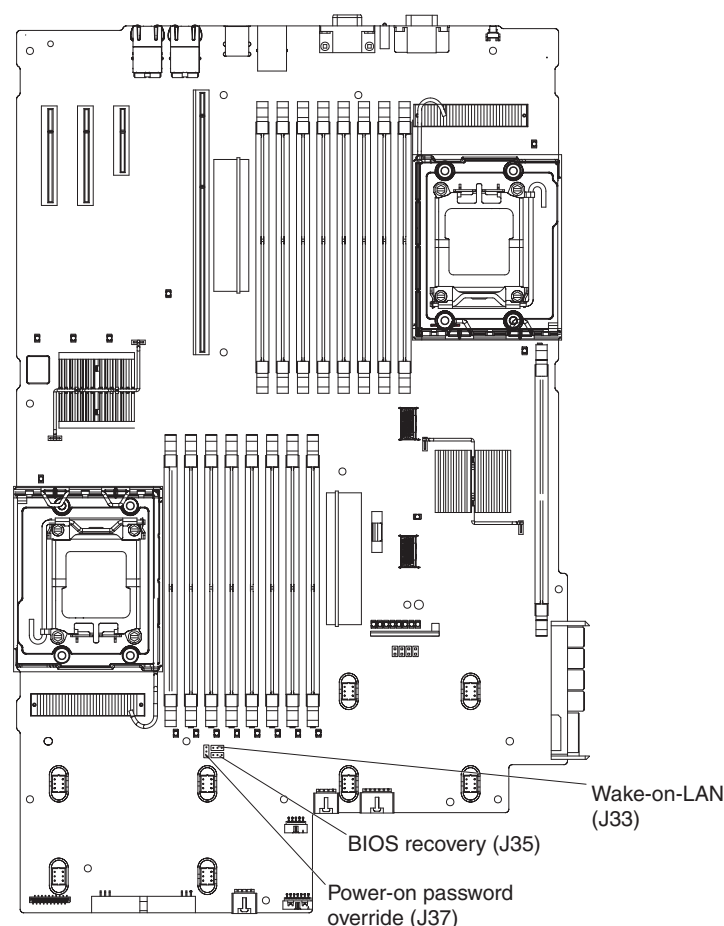


Table 2. System Board Jumpers

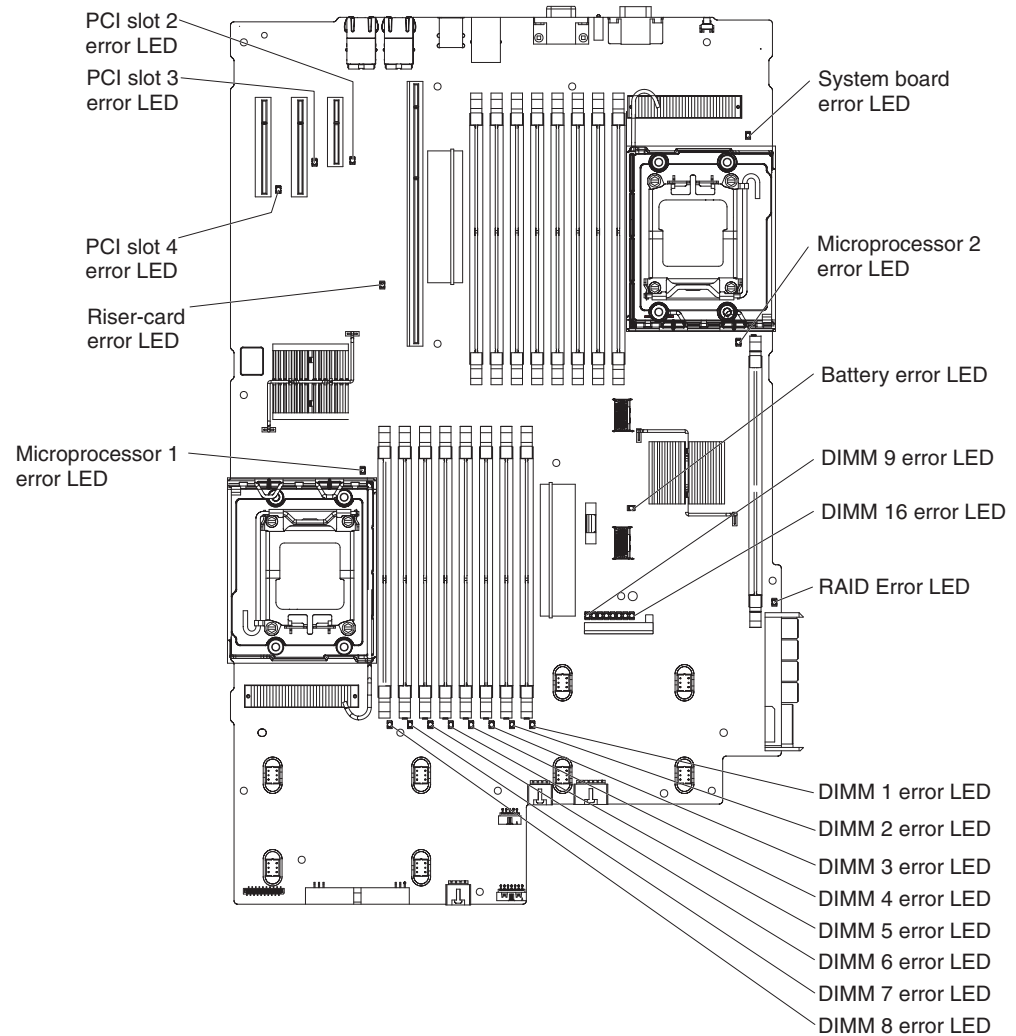
Jumper number	Description
J33	Wake on LAN: The default position is pins 1 and 2. Change the position of this jumper to pins 2 and 3 to prevent a Wake on LAN packet from waking the system when the system is in the power-off state.
J35	BIOS recovery: The default position is pins 1 and 2 (use the primary page during startup). Move the jumper to pins 2 and 3 to use the secondary page during startup.
J37	Power-on password: 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 the next time the server is turned on and starts the Configuration/Setup Utility so that you can change or delete the power-on password. Changing the position of this jumper does not affect the administrator password check if an administrator password is set. If you forget the administrator password, you must replace the system board. For additional information about passwords, see “Passwords” on page 69.

Notes:

1. Before changing jumpers, turn off the server; then, disconnect all power cords and external cables. (Review the information in “Safety” on page v, “Installation guidelines” on page 23, “Handling static-sensitive devices” on page 25, and “Turning off the server” on page 13.)
2. Any system-board jumper blocks that are not shown in the illustrations in this document are reserved.

System-board LEDs

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



Installation guidelines

Before you install optional devices, read the following information:

- Read the safety information that begins on page v and the guidelines in “Handling static-sensitive devices” on page 25. This information will help you work safely.
- When you install your new server, take the opportunity to download and apply the most recent firmware updates. This step will help to ensure that any known issues are addressed and that your server is ready to function at maximum levels of performance. To download firmware updates for your server, go to <http://www.ibm.com/servers/eserver/support/xseries/index.html>, select **System x3655** from the **Hardware** list, click **Go**, and click the **Downloads** tab. For additional information about tools for updating, managing, and deploying firmware, see the System x and xSeries Tools Center at <http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp>.
- Before you install optional hardware devices, make sure that the server is working correctly. Start the server, and make sure that the operating system

starts, if an operating system is installed, or that a 19990305 error code is displayed, indicating that an operating system was not found but the server is otherwise working correctly. If the server is not working correctly, see “Solving problems” in the *Installation Guide* for diagnostic information.

- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- If you must start the server while the cover is removed, make sure that no one is near the server and that no tools or other objects have been left inside the server.
- Do not attempt to lift an object that you think is too heavy for you. If you have to lift a heavy object, observe the following precautions:
 - Make sure that you can stand safely without slipping.
 - Distribute the weight of the object equally between your feet.
 - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
 - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.
- Make sure that you have an adequate number of properly grounded electrical outlets for the server, monitor, and other devices.
- Back up all important data before you make changes to disk drives.
- Have a small flat-blade screwdriver available.
- You do not have to turn off the server to install or replace hot-swap power supplies, hot-swap fans, or hot-plug Universal Serial Bus (USB) devices. However, you must turn off the server before performing any steps that involve removing or installing adapter cables.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the server, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- When you are finished working on the server, reinstall all safety shields, guards, labels, and ground wires.
- For a list of supported optional devices for the server, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

System reliability guidelines

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

- 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 2 minutes) with the server cover removed might damage server components.

- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan within 48 hours.
- You have replaced a hot-swap drive within 2 minutes of removal.
- You do not operate the server without the air baffles installed. Operating the server without the air baffles might cause the microprocessor to overheat.
- Microprocessor socket 2 always contains either a heat-sink filler or a microprocessor and heat sink.

Working inside the server with the power on

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

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

- Avoid wearing loose-fitting clothing on your forearms. Button long-sleeved shirts before 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.
- Do not drop any metallic objects, such as paper clips, hairpins, and screws, into the server.

Handling static-sensitive devices

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

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

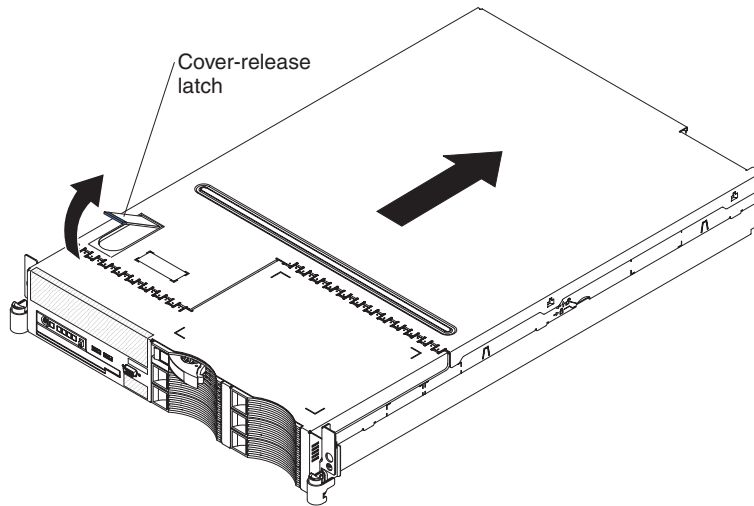
- Limit your movement. Movement can cause static electricity to build up around you.
- The use of a grounding system is recommended. For example, wear an electrostatic-discharge wrist strap, if one is available. Always use an electrostatic-discharge wrist strap or other grounding system when working inside the server with the power on.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal surface on the outside of the server for at least 2 seconds. This drains static electricity from the package and from your body.

- Remove the device from its package and install it directly into the server without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the server cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Removing the cover

The following illustration shows how to remove the cover.

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



To remove the cover, complete the following steps:

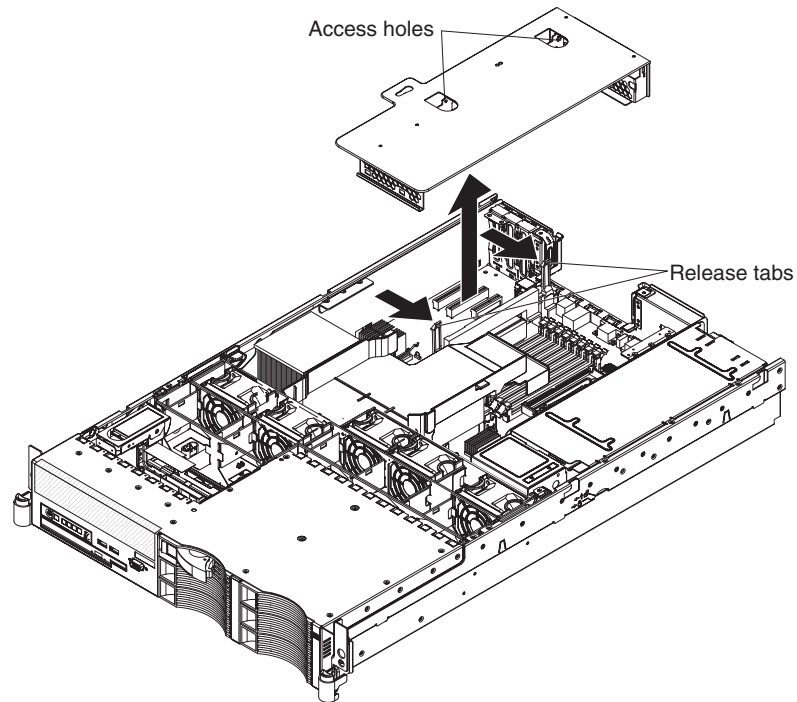
1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. If you are planning to install or remove a microprocessor, memory module, PCI adapter, or tape drive, turn off the server and all attached devices and disconnect all external cables and power cords (see “Turning off the server” on page 13).
3. Press down on the left and right side latches and pull the server out of the rack enclosure until both slide rails lock.

Note: You can reach the cables on the back of the server when the server is in the locked position.

4. Lift the cover-release latch. Lift the cover off the server and set the cover aside.

Removing the riser-card assembly

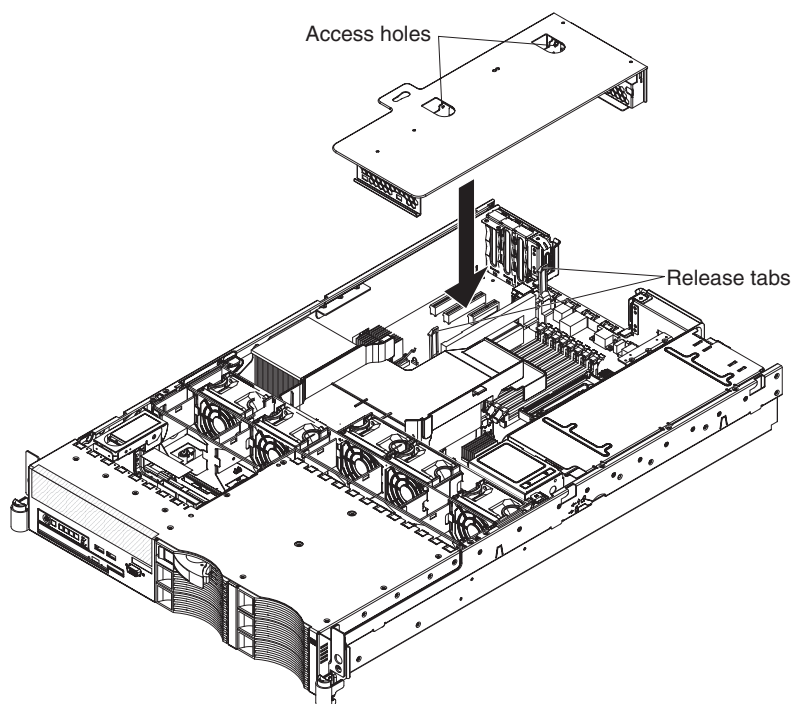
The sever comes with one riser-card assembly that contains an HTX riser card that has an HTX adapter slot. You can replace the HTX riser-card assembly with one that has a PCI-X 64-bit 133 MHz connector, or one that has a PCI-Express x16 connector. See <http://www.ibm.com/servers/eserver/serverproven/compat/us/> for a list of riser-card assemblies that you can use with the server.



To remove the riser-card assembly, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Make sure that the server and all peripheral devices are turned off, and that the power cords and all external cables are disconnected (see “Turning off the server” on page 13); then, remove the cover (see “Removing the cover” on page 26).
3. Push the two retention latches on the riser-card assembly toward the second microprocessor socket; then, grasp the assembly at the rear and side edges and lift it to remove it from the server. Place the riser-card assembly on a flat, static-protective surface.

Installing the riser-card assembly



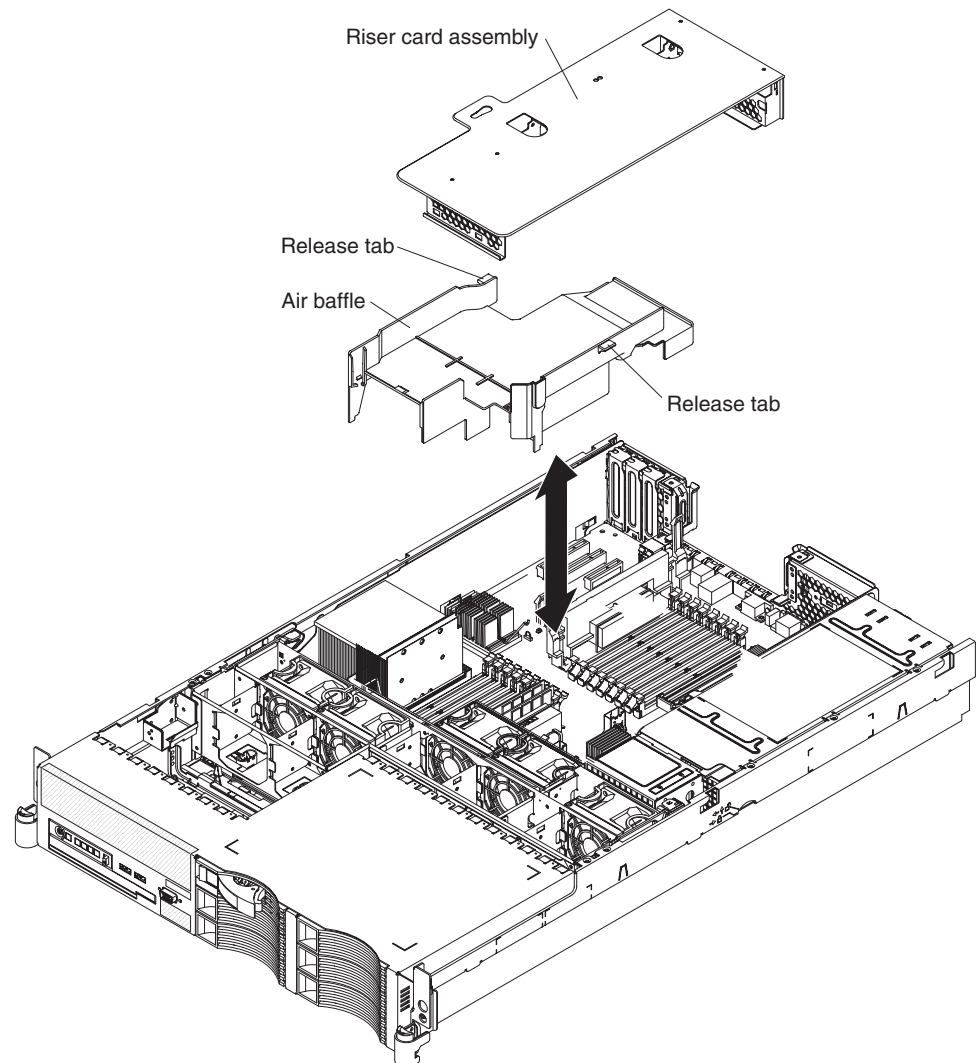
To install the riser-card assembly, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Make sure that the server and all peripheral devices are turned off, and that the power cords and all external cables are disconnected (see “Turning off the server” on page 13); then, remove the cover (see “Removing the cover” on page 26).
3. Reinstall any adapters and reconnect any cables you might have removed in other procedures.
4. Carefully align the riser-card assembly with the release tab posts, the guides on the rear of the server, and the riser-card connector on the system board; then, press down on the assembly. Make sure that the riser-card assembly is fully seated in the riser-card connector on the system board.

If you have other devices to install, do so now. Otherwise, go to “Completing the installation” on page 61.

Removing the air baffle

When you work with some optional devices, you must first remove the air baffle to access certain components or connectors on the system board. The following illustration shows how to remove the air baffle.

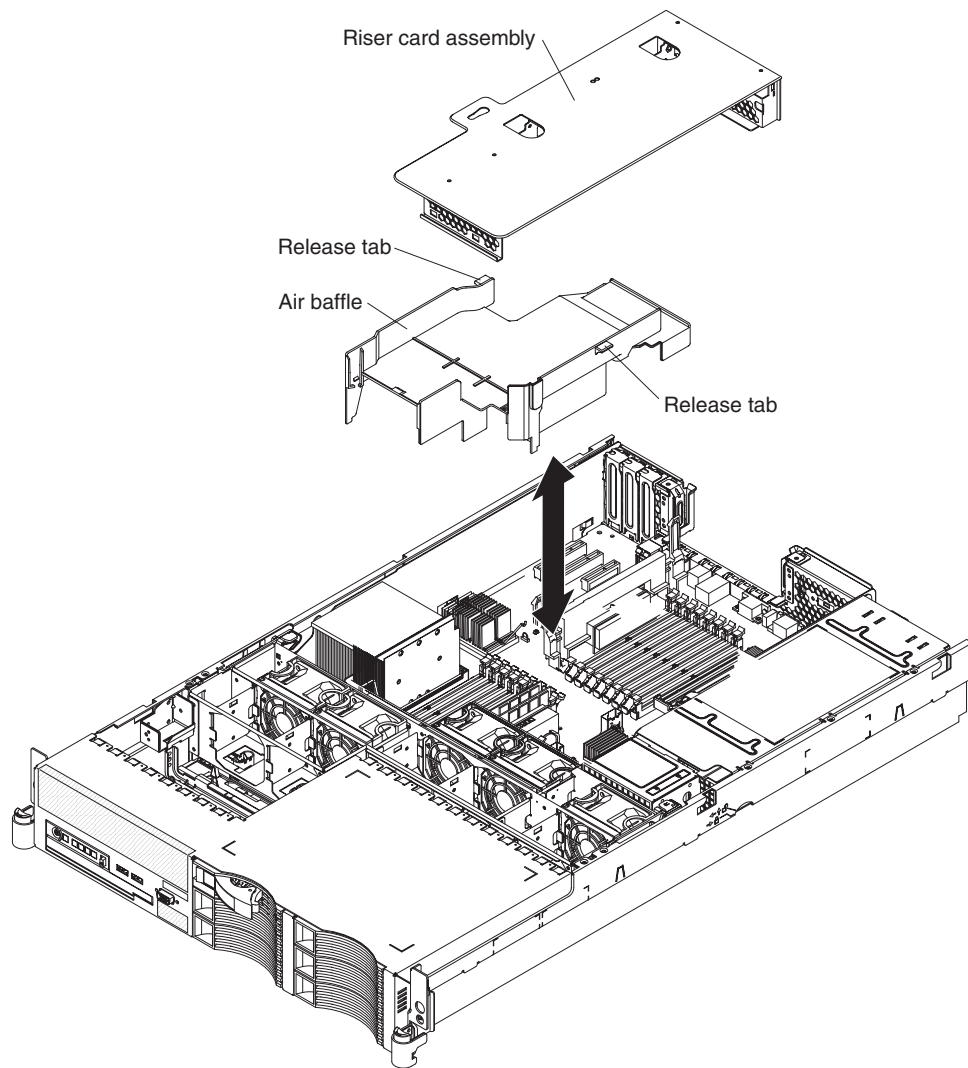


Attention: For proper cooling and airflow, replace the air baffle before you turn on the server. Operating the server with an air baffle removed might damage server components.

To remove the air baffle, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables (see “Turning off the server” on page 13; then, remove the cover (see “Removing the cover” on page 26).
3. Grasp the release tabs on each side of the air baffle, and lift the air baffle out of the server.

Installing the air baffle

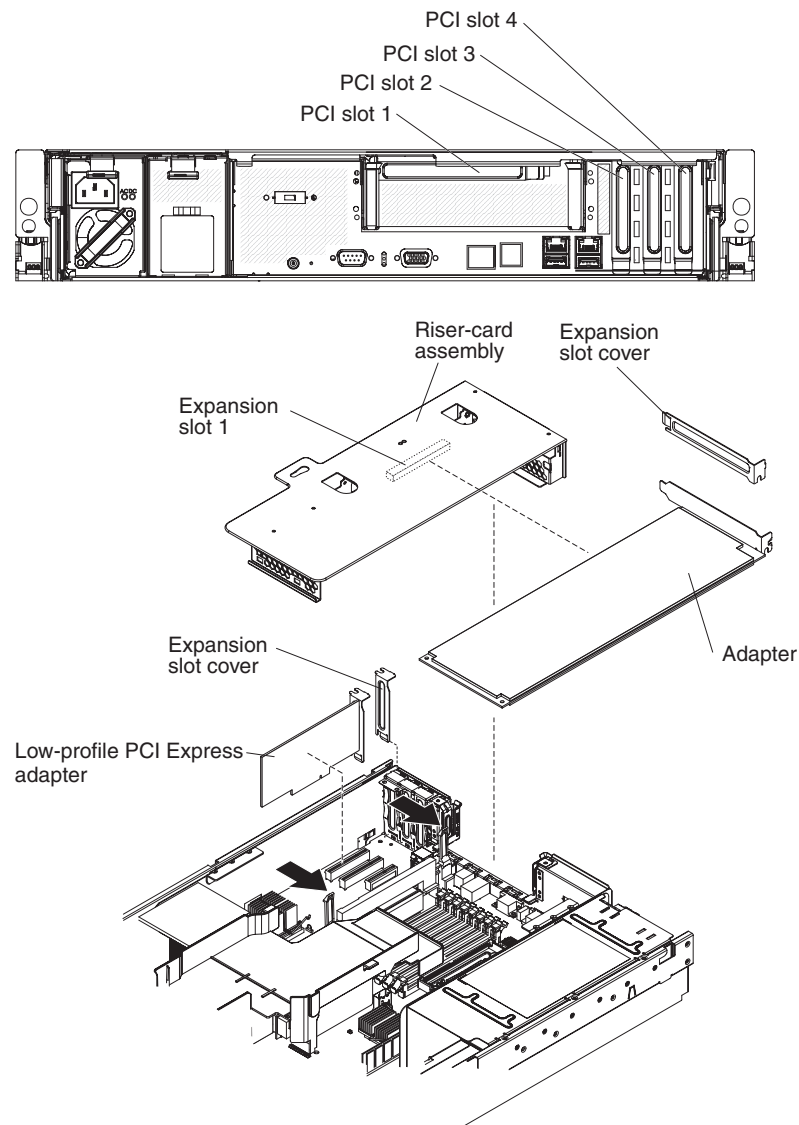


To install the air baffle, complete the following steps.

Attention: For proper cooling and airflow, replace the air baffle before you turn on the server. Operating the server with an air baffle removed might damage server components.

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Make sure that the server and peripheral devices are turned off (see “Turning off the server” on page 13) and that all power cords and external cables are disconnected; then, remove the cover (see “Removing the cover” on page 26).
3. Hold the air baffle by the release tabs on each side. Align the front of the air baffle with the rear of the fan bracket assembly and the side of the heat sink on microprocessor number one.
4. Slide the air baffle down into the server until the bottom edge rests on the system board.

Installing an adapter



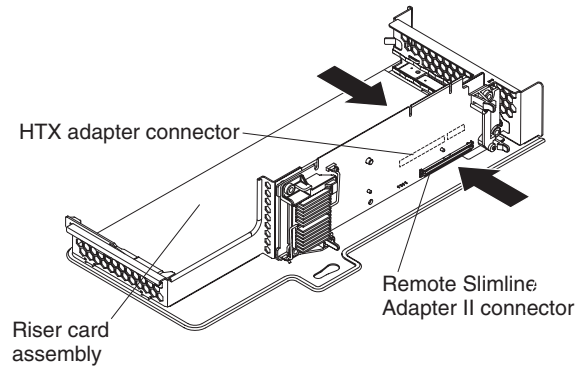
The following notes describe the types of adapters that the server supports and other information that you must consider when installing an adapter:

- You can install only low-profile adapters in PCI slots 2, 3, and 4 on the system board.
- You can install a standard full-length HTX, PCI Express, or PCI-X adapter (25 W maximum) in slot 1 on the riser-card assembly.
- Your server supports only 3.3 V and universal PCI adapters.
- The PCI bus configuration is as follows:
 - Non-hot-plug, full-length PCI Express x16 (x16 lanes) or PCI-X 64 bit, 133 MHz, slot 1
 - Non-hot-plug, low profile PCI Express x4 (x4 lanes), slot 2
 - Non-hot-plug, low profile PCI Express x8 (x8 lanes), slots 3 and 4
- The system scans devices in the following order, if you have not changed the default boot precedence: integrated Ethernet controllers, integrated SAS controller, and then PCI slots 1, 2, 3, and 4.

Riser card

The following illustration shows the location of the adapter expansion slots on the riser card.

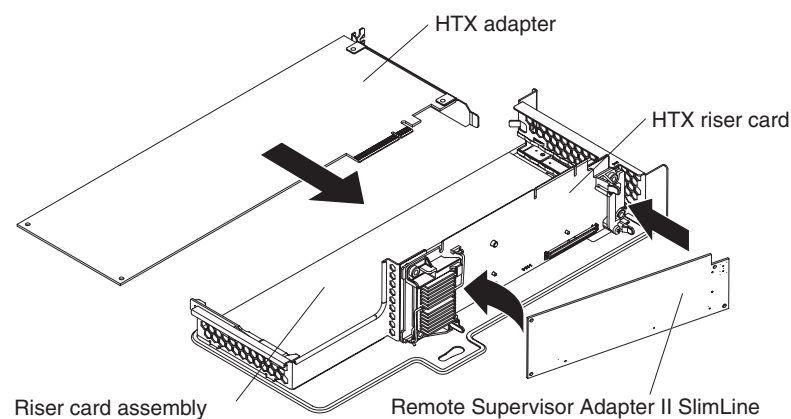
Note: For clarity, the riser-card assembly is inverted in the illustrations.



To install an adapter, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables (see “Turning off the server” on page 13).
3. Determine which expansion slot you will use for the adapter.
4. If you are installing an adapter in slot 1, remove the riser-card assembly (see “Removing the riser-card assembly” on page 26).
5. Slide the expansion-slot cover out of the PCI low-profile expansion slot or the riser-card assembly expansion slot.
6. Install the adapter. The following illustration shows how to install an adapter in the riser-card assembly.

Note: For clarity, the riser-card assembly is shown inverted in the following illustration.



7. If you removed the riser-card assembly to install the adapter, align the riser-card assembly with the release-tab posts, rear guides, and connector; then, press the riser-card assembly *firmly* into the connector (see “Installing the riser-card assembly” on page 28).

8. Connect any required cables to the adapter.

Attention:

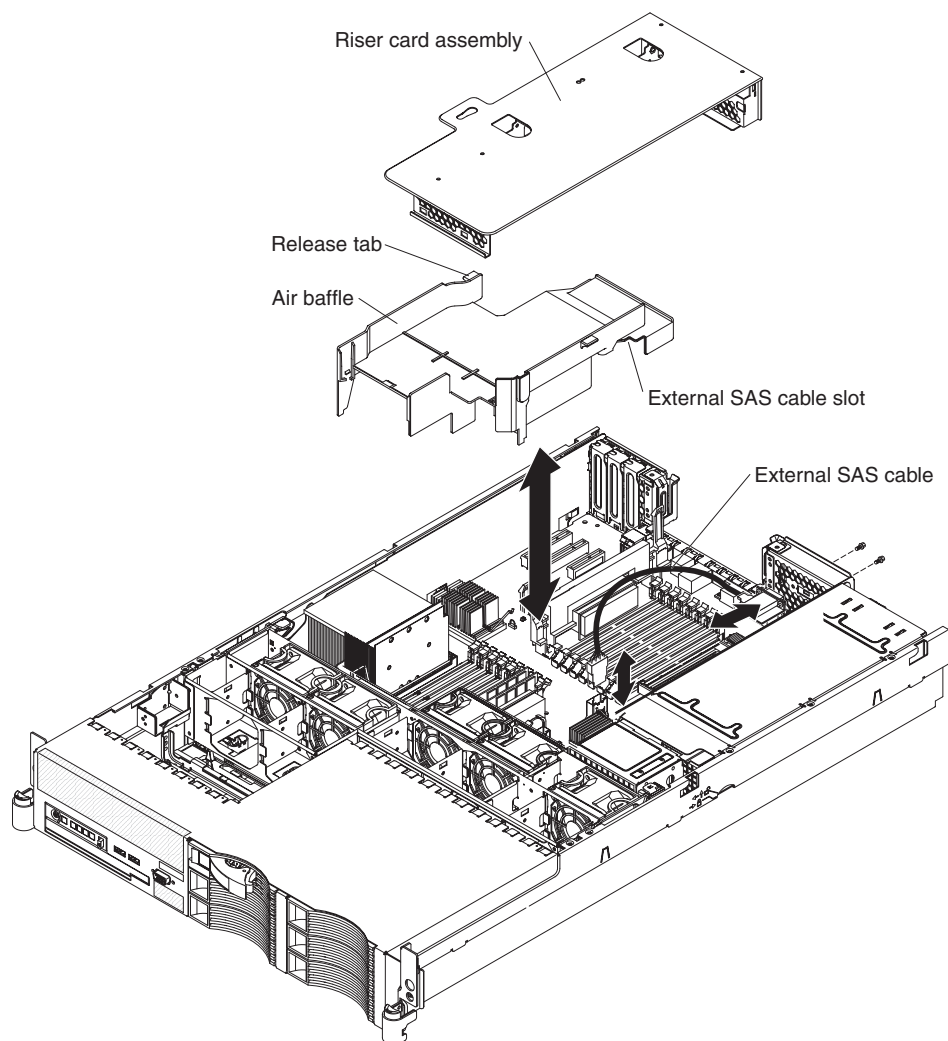
- When you route cables, do not block any connectors or the ventilated space around any of the fans.
 - Make sure that cables are not routed on top of components under the riser-card assembly.
 - Make sure that the cables are not pinched by the server components
9. Perform any configuration tasks that are required for the adapter.

If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 61.

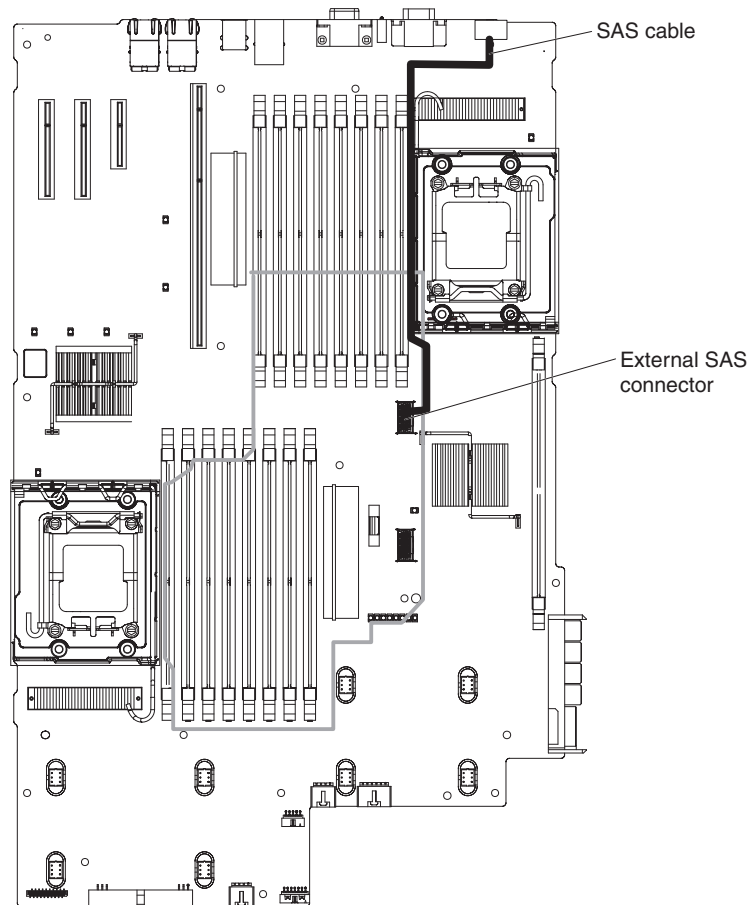
Installing the external SAS cable

To install the external SAS cable, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the server and all attached devices (see “Turning off the server” on page 13).
3. Disconnect all external cables and power cords.
4. Slide the server out of the rack.
5. Remove the cover (see “Removing the cover” on page 26).
6. Remove the riser-card assembly (see “Removing the riser-card assembly” on page 26).
7. Remove the air baffle (see “Removing the air baffle” on page 29).
8. Remove the cap on the external SAS connector on the system board.
9. Using the screws supplied with the cable, attach the end of the cable with the connector to the rear of the chassis. Attach the other end of the cable to the external SAS connector on the system board.



The following illustration shows the routing for the external SAS cable.



10. Install the air baffle (see “Installing the air baffle” on page 30); then, route the cable through the slot in the side of the air baffle.

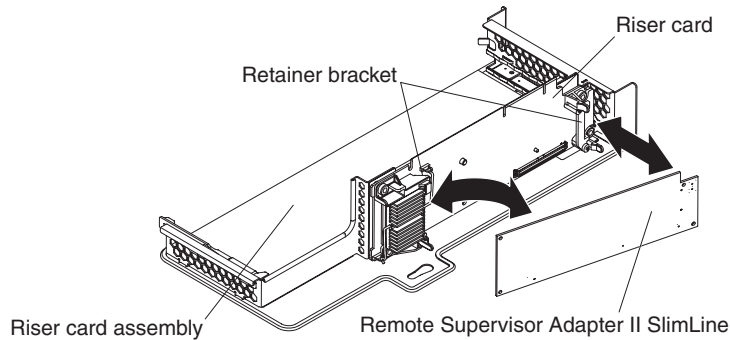
Important: Make sure the SAS cable doesn’t interfere with an adapter installed in the riser-card assembly.

If you have other devices to install or remove, do so now. Otherwise go to “Completing the installation” on page 61.

Installing the Remote Supervisor Adapter II SlimLine

An optional Remote Supervisor Adapter II SlimLine can be installed only in a dedicated connector on the riser card. After the Remote Supervisor Adapter II SlimLine is installed, the systems-management Ethernet port on the rear of the server is active.

Note: Earlier versions of the Remote Supervisor Adapter II SlimLine might not work in this server. See <http://www.ibm.com/servers/eservers/serverproven/compat/us/> for information about the supported Remote Supervisor Adapter II SlimLine.



To install a Remote Supervisor Adapter II SlimLine, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables (see “Turning off the server” on page 13); then, remove the cover (see “Removing the cover” on page 26).
3. Remove the riser-card assembly (see “Removing the riser-card assembly” on page 26).
4. Turn the Remote Supervisor Adapter II SlimLine card so that the connector aligns correctly with the connector on the riser card.
5. Install the end of the adapter without the connector first. Slide the adapter under the tabs; then, slide the holes in the adapter onto the pins on the retainer bracket.
6. Rotate the free end of the card down under the tabs and onto the pins on the retainer brackets; then, press the card into the connector on the riser card and make sure that all the tabs on the latch brackets secure the card in place.
7. Replace the riser-card assembly (see “Installing the riser-card assembly” on page 28).

See the documentation that comes with the Remote Supervisor Adapter II SlimLine for information about installing the firmware and configuring the adapter. Create a backup copy of the configuration so that if you need to replace the adapter in the future, you can restore the configuration.

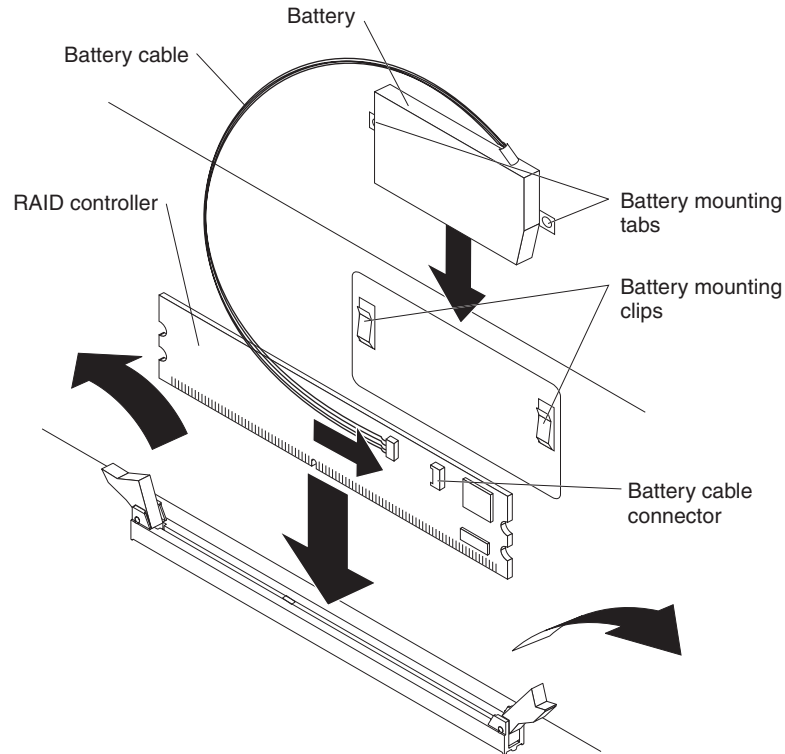
Note: When you start the server for the first time after you install a Remote Supervisor Adapter II SlimLine, the start-up process will take several minutes longer than a typical start-up.

If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 61.

Replacing the ServeRAID SAS controller

The following illustration shows how to install the ServeRAID-8k SAS Controller.

Note: The ServeRAID-8k-I SAS controller does not have a battery.



Attention: To avoid breaking the retaining clips or damaging the connectors, handle the clips gently.

The ServeRAID SAS controller can be installed only in a dedicated slot on the system board. The server comes with a ServeRAID-8k-I SAS controller installed. To replace the ServeRAID-8k-I SAS controller with a ServeRAID-8k SAS controller, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables (see “Turning off the server” on page 13); then, remove the cover (see “Removing the cover” on page 26).
3. Locate the ServeRAID SAS controller on the system board.
4. Move the SAS cable so it is not interfering with removing the ServeRAID SAS controller.
5. Open the retaining clip on each end of the connector.
6. Lift the ServeRAID SAS controller out of the connector.
7. Touch the static-protective package that contains the new ServeRAID SAS controller to any unpainted metal surface on the server. Then, remove the ServeRAID SAS controller from the package.
8. Turn the new ServeRAID SAS controller card so that the key on the bottom edge aligns correctly with the connector.
9. Firmly press the ServeRAID SAS controller straight down into the connector by applying pressure on both ends of the card simultaneously. The retaining clips snap into the locked position when the card is firmly seated in the connector.

Note: If there is a gap between the controller and the retaining clips, the controller has not been properly installed. In this case, open the retaining clips and remove the controller; then, reinsert the card.

10. Remove the battery from the ServeRAID SAS controller package.
11. Slide the battery mounting tabs into the battery mounting clips on the wall of the power supply bay, next to the ServeRAID-8k SAS connector.
12. Connect the battery cable to the ServeRAID SAS controller card.
13. Reposition the SAS cable.

If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 61.

Note: When you restart the server, you will be given the opportunity to import the existing RAID configuration to the new RAID controller.

Installing a hard disk drive

Locate the documentation that comes with the hard disk drive and follow those instructions in addition to the instructions in this chapter.

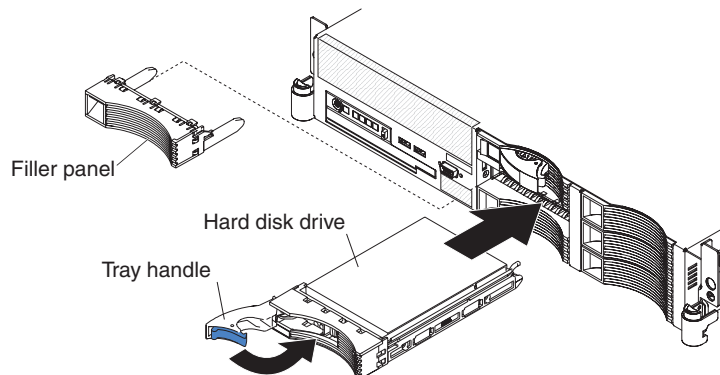
The following notes describe the type of hard disk drive that the server supports and other information that you must consider when installing a hard disk drive:

- The server 3.5-inch models support six slim 3.5-inch hard disk drives installed on Ultra-Slim hard disk drive trays for 3.5-inch drives. For a list of supported 3.5-inch hard disk drives, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.
- The server 2.5-inch models support eight 2.5-inch hot-swap hard disk drives installed on Ultra-Slim hard disk drive trays for 2.5-inch drives. For a list of supported 2.5-inch hard disk drives, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.
- All hot-swap drives in the server should have the same throughput speed rating. Mixing hard disk drives with different speed ratings will cause all drives to operate at the lower throughput speed.
- The ID that is assigned to each bay is printed on the server front.

The following illustrations show how to install a hot-swap hard disk drive.

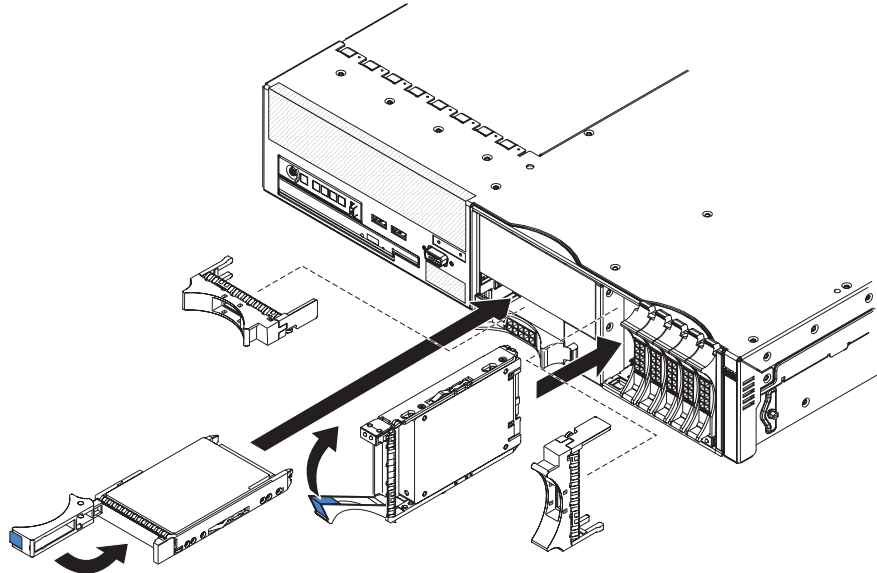
3.5-inch drives

Important: Install only SAS or SATA 3.5-inch hard disk drives in this server.



2.5-inch drives

Important: Install only SAS 2.5-inch hard disk drives in this server.



To install a drive in a hot-swap bay, complete the following steps.

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

1. Read the safety information beginning on page v and “Installation guidelines” on page 23.
2. Remove the filler panel from one of the empty hot-swap bays.
 - 3.5-inch models: Insert your finger into the depression at the left side of the filler panel and pull it away from the server.
 - 2.5-inch models: Grasp both sides of the front of the filler panel and pull it away from the server.
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 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 verify that the hard disk drive is operating properly.

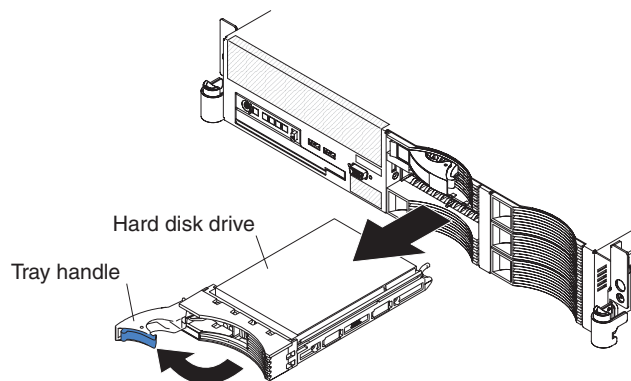
If the amber hard disk drive status LED for a drive is lit continuously, that drive is faulty and must be replaced. If the green hard disk drive activity LED is flashing, the drive is being accessed.

Note: You might have to reconfigure the disk arrays after installing hard disk drives. See the ServeRAID documentation on the IBM *ServeRAID Support CD* for information about ServeRAID controllers.

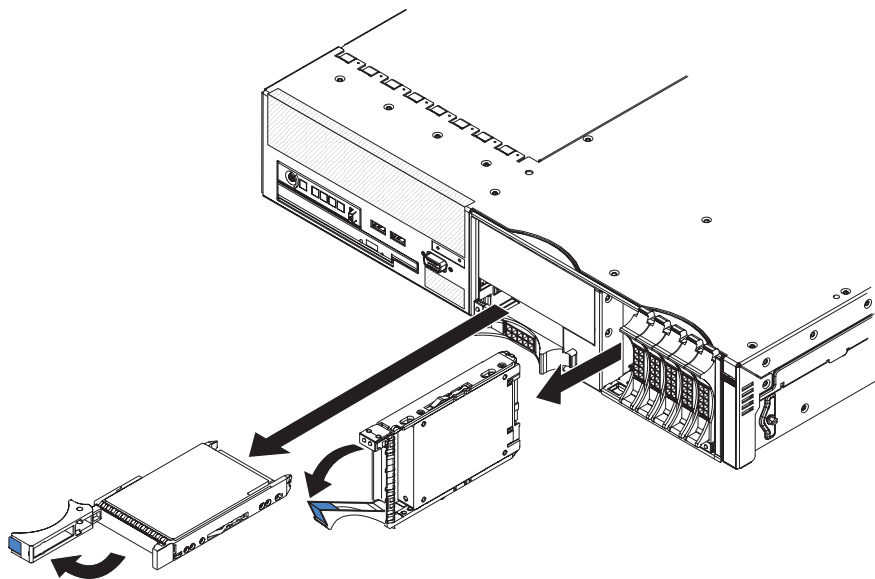
If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 61.

Removing a hard disk drive

3.5-inch drives



2.5-inch drives



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

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Move the handle on the drive to the open position (perpendicular to the drive).
3. Pull the hot-swap drive assembly from the bay.

Note: You might have to reconfigure the disk arrays after you remove a hard disk drive. See the ServeRAID documentation on the IBM **ServeRAID Support** CD for information about ServeRAID controllers.

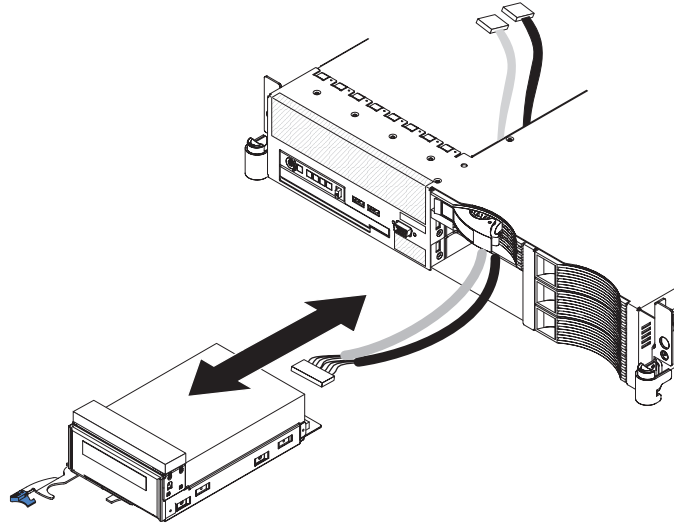
If you have other devices to install or remove, do so now. Otherwise go to “Completing the installation” on page 61.

Installing an optional tape drive

Prepare the drive according to the instructions that come with the drive, setting any switches or jumpers; then, see “Installing a SATA tape drive in a 3.5-inch model server” or “Installing a SATA tape drive in a 2.5-inch model server” on page 43.

Installing a SATA tape drive in a 3.5-inch model server

The SATA tape drive must be installed into the two bottom-left hard disk drive bays. If you have hard disk drives in those bays, move the drives to other bays. The cables for the tape drive come with the tape drive option.



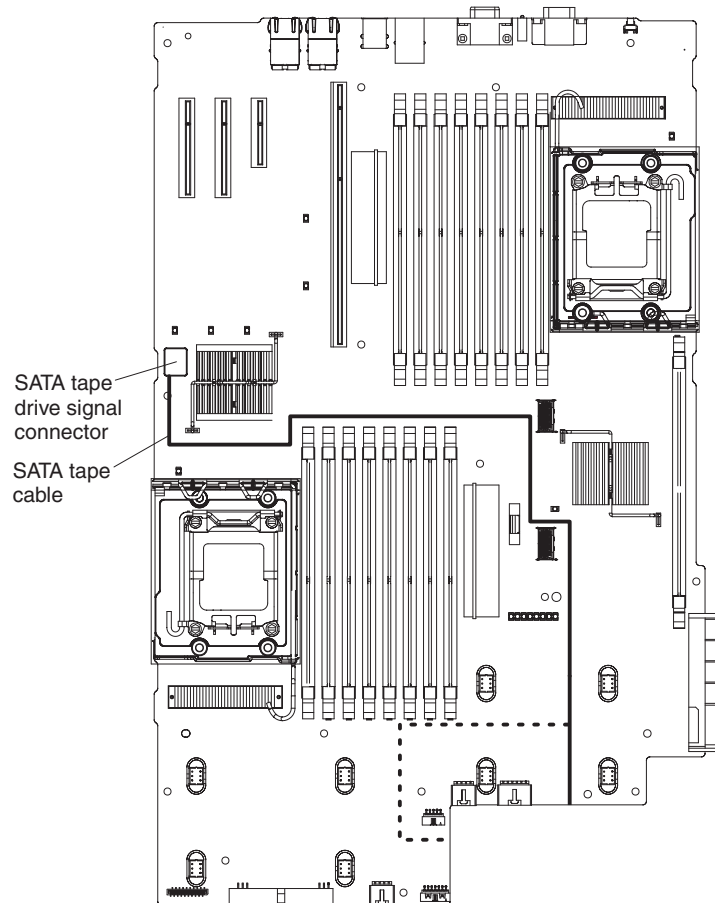
To install a SATA tape drive in a 3.5-inch model server, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. If you have not attached the space filler from the tape drive option to the tape drive assembly, do so now.
3. Remove the server cover.
4. Remove the riser-card assembly (see “Removing the riser-card assembly” on page 26).
5. Remove the air baffle (see “Removing the air baffle” on page 29).
6. Remove the fan-bracket assembly (see “Removing the fan-bracket assembly” on page 60).
7. Remove the filler panels from the two bottom-left hard disk drive bays.
8. From the inside of the server drive cage, thread the tape-drive connector end of the cables through the slot in the left side of the hard disk drive cage and out the front of the server.
9. Connect the cables to the back of the tape drive and route the cable through the cable clamp .
10. Push the tape drive assembly into the bays, gently pulling the cables farther into the server as you do so, until the tape drive assembly stops.
11. Push the tray handle to the closed (locked) position.

12. Connect the tape drive signal cable connector and power cable connector to the system board (see “System-board internal cable connectors” on page 19 for the location of the connectors)..

The following illustration shows the routing of the SATA tape drive signal cable.

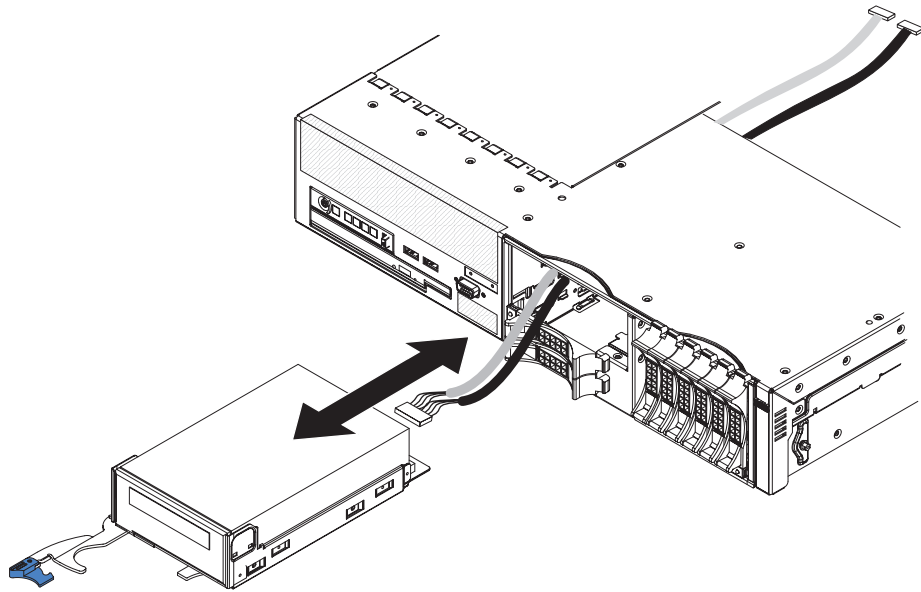
Important: Make sure to route the cables so that you do not obstruct access to the fan connectors.



13. Install the fan-bracket assembly:
 - a. Align the guides on the left and right sides of the assembly with the slots in the sides of the chassis.
 - b. Lower the fan-bracket assembly into the chassis.
 - c. Push the fan-bracket assembly levers toward the rear of the server until they stop; pinch the release latches and metal tabs together and push the levers down into place.
 - d. Press down on the lever metal tabs and on the fans to be sure the fan-bracket assembly is fully seated.

If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 61.

Installing a SATA tape drive in a 2.5-inch model server

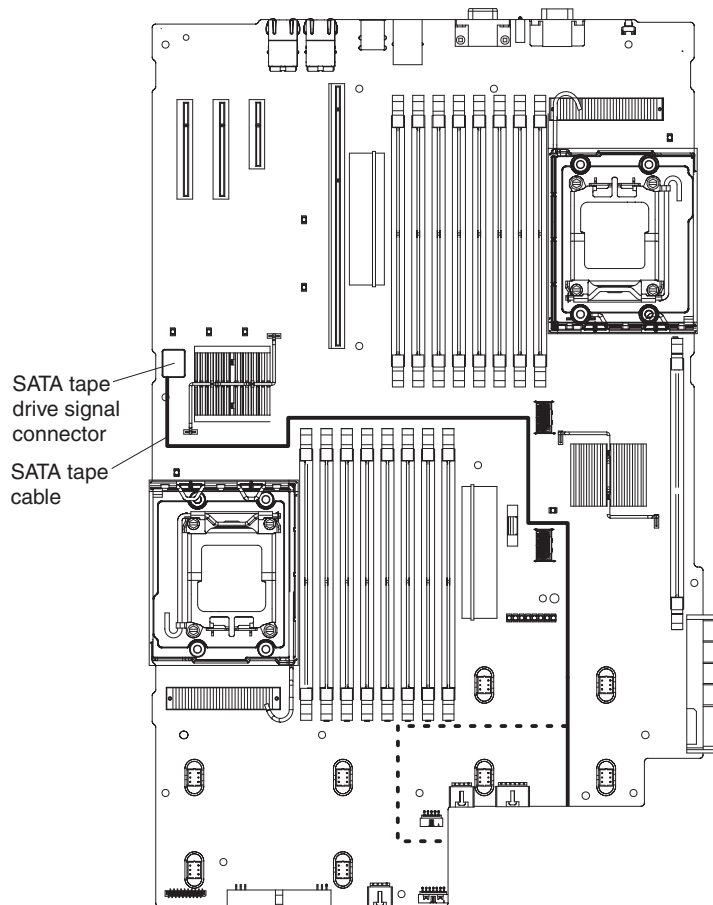


To install a SATA tape drive in a 2.5-inch model server, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. If you installed the space filler from the tape drive option onto the tape drive assembly, remove it now.
3. Remove the server cover.
4. Remove the riser-card assembly (see “Removing the riser-card assembly” on page 26).
5. Remove the air baffle (see “Removing the air baffle” on page 29).
6. Remove the fan bracket assembly (see “Removing the fan-bracket assembly” on page 60).
7. Remove the filler panel from the tape drive bay.
8. From the inside of the server drive cage, thread the tape-drive connector end of the cables through the rear of the tape drive bay and out the front of the server.
9. Connect the cable to the back of the tape drive and route the cable through the cable clamp.
10. Push the tape drive assembly into the tape drive bay, gently pulling the cables farther into the server as you do so, until the tape drive assembly stops.
11. Push the tray handle to the closed (locked) position.
12. Connect the tape drive signal cable connector and power cable connector to the system board (see “System-board internal cable connectors” on page 19 for the location of the connectors).

The following illustration shows the routing for the SATA tape drive signal cable.

Important: Make sure to route the cables so that you do not obstruct access to the fan connectors.



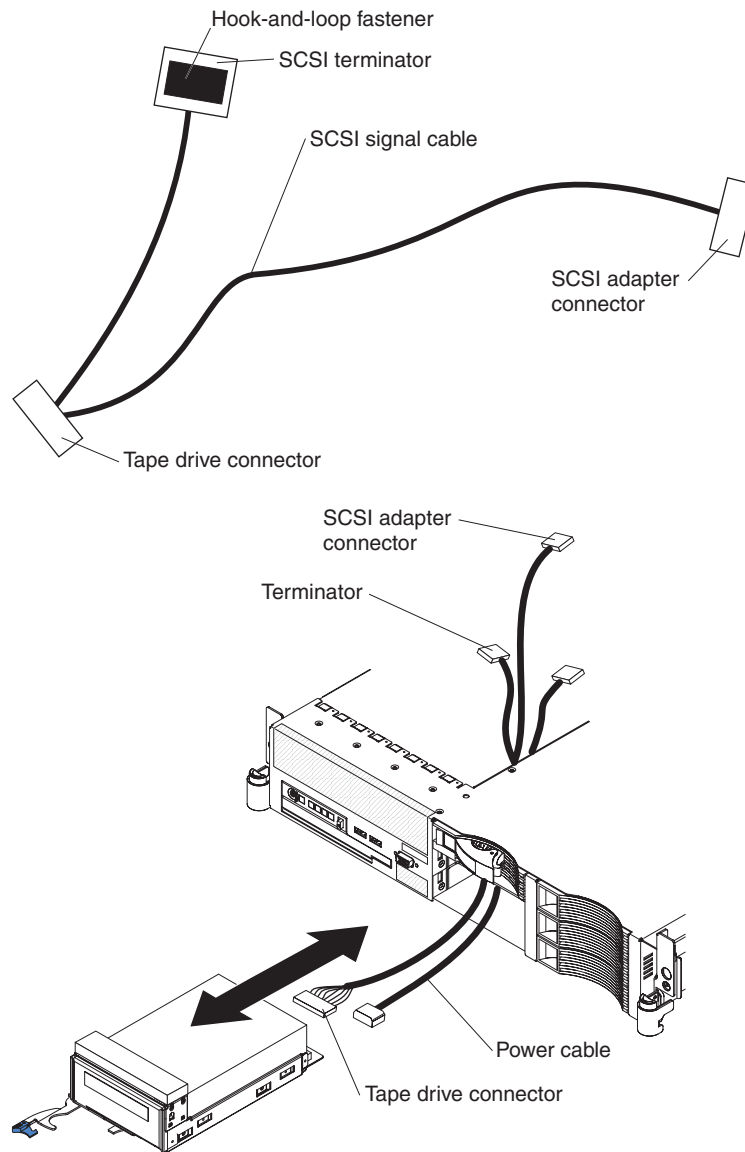
13. Install the fan-bracket assembly:
 - a. Align the guides on the left and right sides of the assembly with the slots in the sides of the chassis.
 - b. Lower the fan-bracket assembly into the chassis.
 - c. Push the fan-bracket assembly levers toward the rear of the server until they stop; pinch the release latches and metal tabs together and push the levers down into place.
 - d. Press down on the lever metal tabs and on the fans to be sure the fan-bracket assembly is fully seated.

If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 61.

Installing a SCSI tape drive in a 3.5-inch model server

This section provides procedures for installing a SCSI tape drive, such as the IBM DDS Generation 5 Internal Tape Drive. The tape drive connects to a PCI-X SCSI adapter in slot 1 of the riser-card assembly. See <http://www.ibm.com/servers/eserver/serverproven/compat/us/> for the list of supported SCSI tape drives and compatible PCI-X SCSI adapters.

The tape drive must be installed in the two bottom-left hard disk drive bays. If you have hard disk drives in those bays, move the drives to other bays. The cables for the tape drive come with the tape drive option.

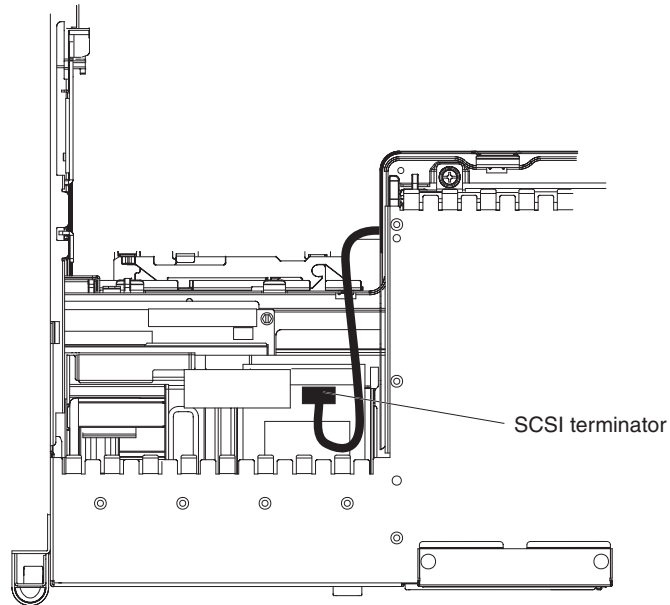


To install a SCSI tape drive in a 3.5-inch model server, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. If you have not attached the space filler from the tape drive option to the tape drive assembly, do so now.
3. Remove the server cover.
4. Remove the riser-card assembly (see “Removing the riser-card assembly” on page 26).
5. Remove the air baffle (see “Removing the air baffle” on page 29).
6. Remove the fan-bracket assembly (see “Removing the fan-bracket assembly” on page 60).
7. Remove the filler panels from the two bottom-left hard disk drive bays.
8. From the inside of the server drive cage, thread the tape-drive connector end of the cables through the slot in the left side of the hard disk drive cage and out the front of the server.

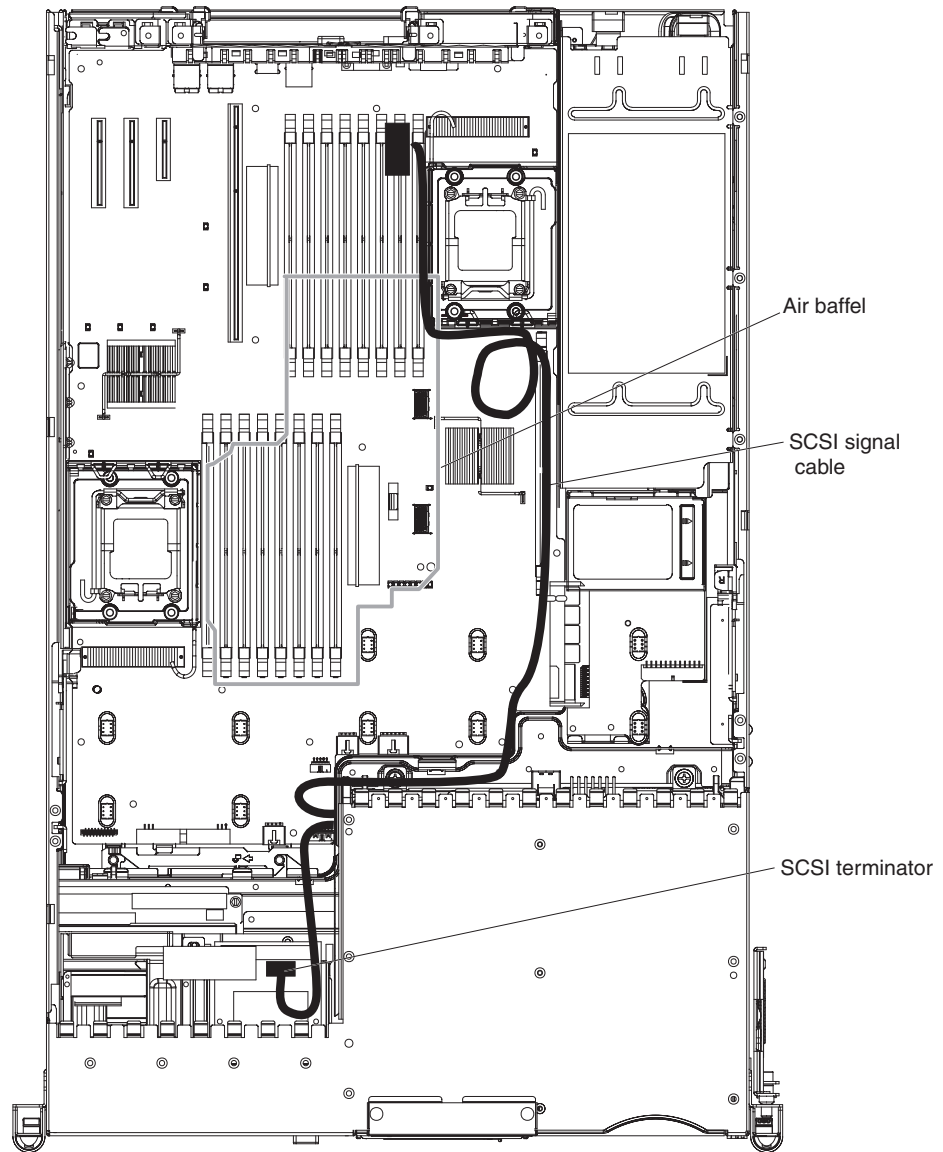
Note: The terminator end of the cable does not go through the slot in the hard disk drive cage.

9. Connect the cables to the back of the tape drive.
10. Push the tape drive assembly into the bays, gently pulling the cables farther into the server as you do so, until the tape drive assembly stops.
11. Push the tray handle to the closed (locked) position.
12. Remove the backing from the hook-and-loop fastener on the SCSI terminator. Attach the terminator to the top of the CD/DVD drive bay as shown in the following illustration.



13. Connect the tape drive signal cable connector and power cable connector to the system board (See "System-board internal cable connectors" on page 19 for the location of the connectors).
14. Route the SCSI signal cable under the SAS cable, through the slot in the side of the air baffle and connect it to the SCSI adapter. The following illustration shows the routing of the signal cable.

Important: Make sure to route the cables so that you do not obstruct access to the fan connectors.



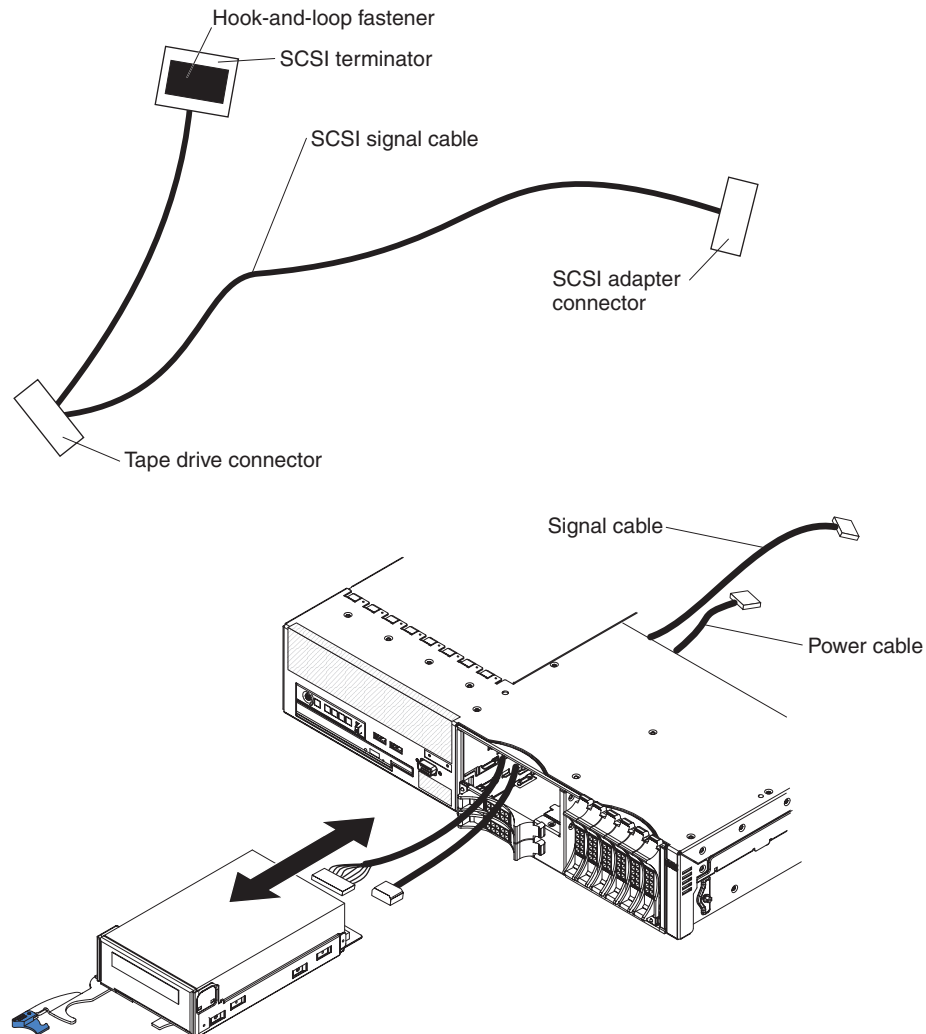
15. Install the air baffle (see “Installing the air baffle” on page 30).
16. Install the riser-card assembly (see “Installing the riser-card assembly” on page 28).
17. Route the tape drive power cable over the SCSI signal cable and attach it to the power connector (J22).
18. Install the fan-bracket assembly:
 - a. Align the guides on the left and right sides of the assembly with the slots in the sides of the chassis.
 - b. Lower the fan-bracket assembly into the chassis.
 - c. Push the fan-bracket assembly levers toward the rear of the server until they stop; pinch the release latches and metal tabs together and push the levers down into place.
 - d. Press down on the lever metal tabs and on the fans to be sure the fan-bracket assembly is fully seated.

If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 61.

Installing a SCSI tape drive in a 2.5-inch model server

This section provides procedures for installing a SCSI tape drive, such as the IBM DDS Generation 5 Internal Tape Drive. The tape drive connects to a PCI-X SCSI adapter in slot 1 of the riser-card assembly. See <http://www.ibm.com/servers/eserver/serverproven/compat/us/> for the list of supported SCSI tape drives and compatible PCI-X SCSI adapters.

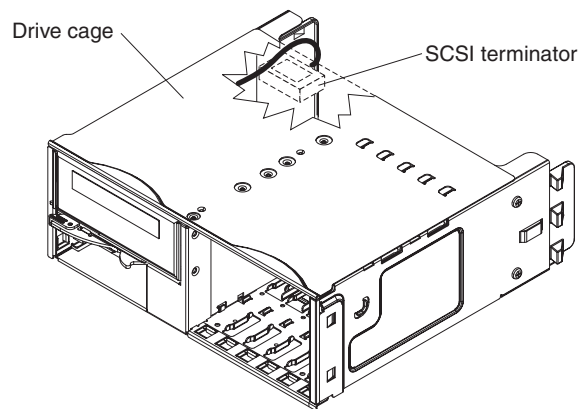
The cables for the tape drive come with the tape drive option.



To install a SCSI tape drive in a 2.5-inch model server, complete the following steps:

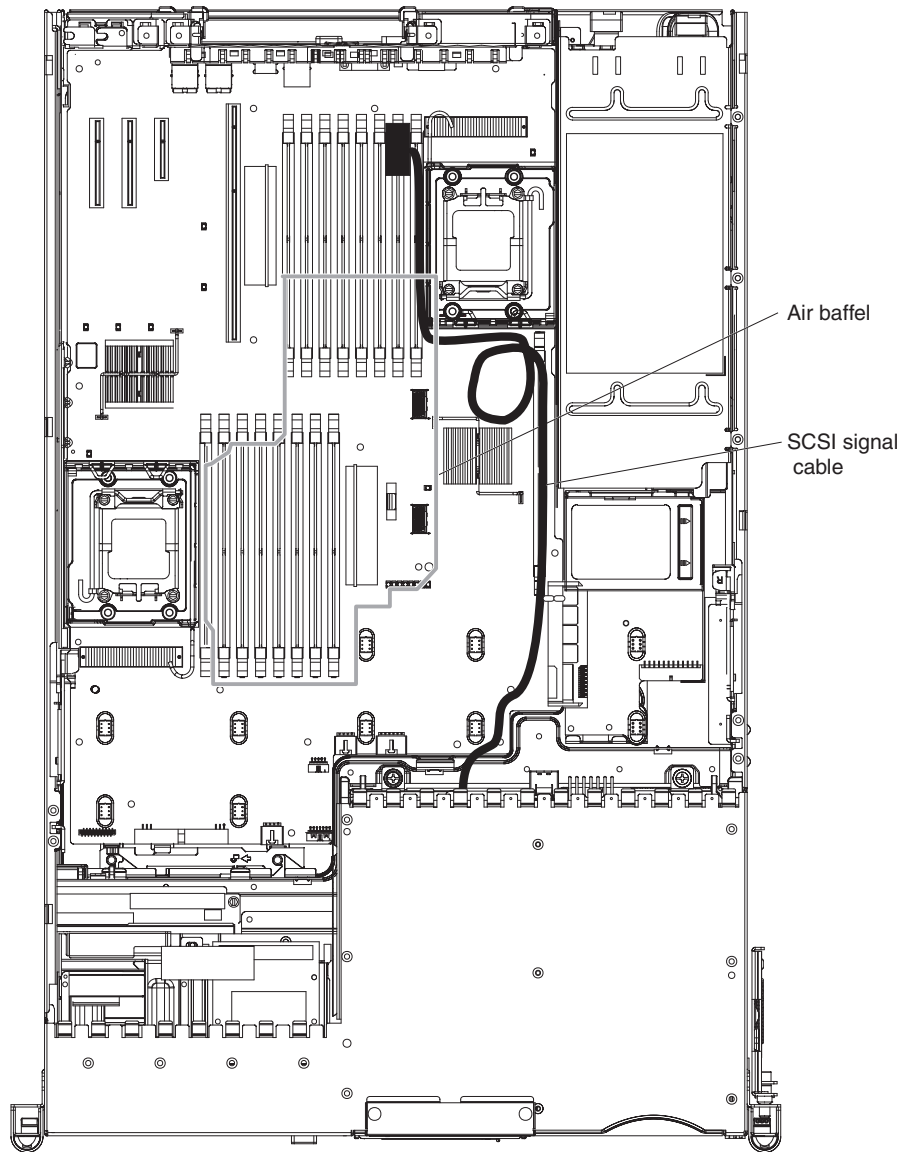
1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. If you installed the space filler from the tape drive option onto the tape drive assembly, remove it now.
3. Remove the filler panel from the tape drive bay.
4. Remove the server cover.
5. Remove the riser-card assembly (see “Removing the riser-card assembly” on page 26).
6. Remove the air baffle (see “Removing the air baffle” on page 29).

7. Remove the fan bracket assembly (see “Removing the fan-bracket assembly” on page 60).
8. Disconnect the backplane cables.
9. Press the large blue release tabs at the rear of the drive cage toward each other; then, push the drive cage assembly out through the front of the server.
10. Connect the cables to the back of the tape drive.
11. Thread the cables through the tape drive bay toward the server.
12. Push the tape drive assembly into the tape drive bay, gently pulling the cables out the back of the tape drive as you do so, until the tape drive assembly stops.
13. Push the tray handle to the closed (locked) position.
14. Remove the backing from the hook-and-loop fastener on the SCSI terminator. Attach the terminator to the inside top of the tape drive bay making sure that it does not block any cables or connectors in the bay.



15. Slide the drive cage assembly into the front of the server, gently pulling the cables into the server until it clicks into place. Make sure the release latches hold the backplane securely in place.
16. Connect the backplane cables, that you disconnected previously, to the drive backplane.
17. Connect the tape drive signal cable connector and power cable connector to the system board (See “System-board internal cable connectors” on page 19 for the location of the connectors).
18. Route the SCSI signal cable under the SAS cable, through the slot in the side of the air baffle and connect it to the SCSI adapter. The following illustration shows the routing of the SCSI tape drive signal cable.

Important: Make sure to route the cables so that you do not obstruct access to the fan connectors.



19. Install the air baffle (see “Installing the air baffle” on page 30).
20. Install the riser card assembly (see “Installing the riser-card assembly” on page 28).
21. Connect the tape drive power cable to the power connector (J22).
22. Install the fan-bracket assembly:
 - a. Align the guides on the left and right sides of the assembly with the slots in the sides of the chassis.
 - b. Lower the fan-bracket assembly into the chassis.
 - c. Push the fan-bracket assembly levers toward the rear of the server until they stop; pinch the release latches and metal tabs together and push the levers down into place.
 - d. Press down on the lever metal tabs and on the fans to be sure the fan-bracket assembly is fully seated.

If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 61.

Installing a microprocessor

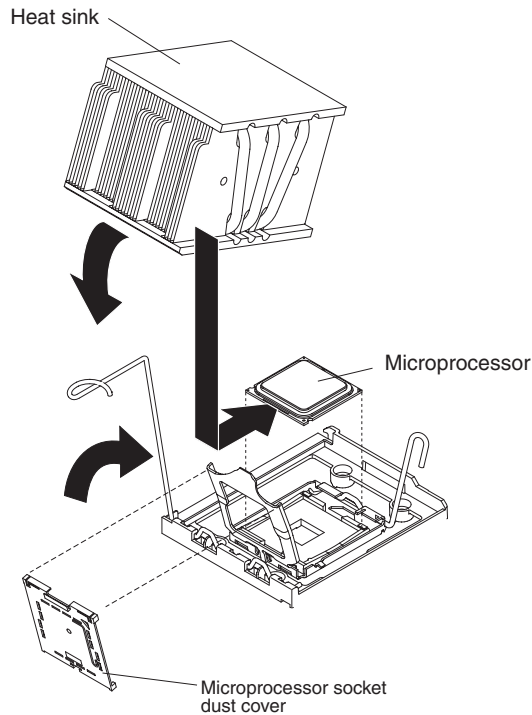
The following notes describe the type of microprocessor that the server supports and other information that you must consider when installing a microprocessor:

- The server supports up to two AMD Opteron microprocessors. If the server comes with one microprocessor, you can install a second microprocessor but it must be the same type and speed as the original microprocessor.
- Read the documentation that comes with the microprocessor to determine whether you must update the basic input/output system (BIOS) code for the server. To download the latest level of BIOS code and many other code updates for your server go to <http://www.ibm.com/servers/eserver/support/xseries/index.html>, select **System x3655** from the **Hardware** list, and click the **Download** tab.
- (Optional) Obtain an SMP-capable operating system. For a list of supported operating systems and other optional devices, go to <http://www.ibm.com/servers/eserver/serverproven/compat/us>.
- To order additional microprocessor options, contact your IBM marketing representative or authorized reseller.
- The microprocessor speeds are automatically set for this server; therefore, you do not have to set any microprocessor frequency-selection jumpers or switches.
- If you have to replace a microprocessor, call for service.
- If the thermal-grease protective cover (for example, a plastic cap or tape liner) is removed from the heat sink, do not touch the thermal grease on the bottom of the heat sink or set down the heat sink.
- Do not remove the first microprocessor from the system board to install the second microprocessor.

See “System-board optional-device connectors” on page 17 for the location of the microprocessor connectors.

The following illustration shows how to install the second microprocessor on the system board.

Note: For clarity, certain components have been removed from this illustration.

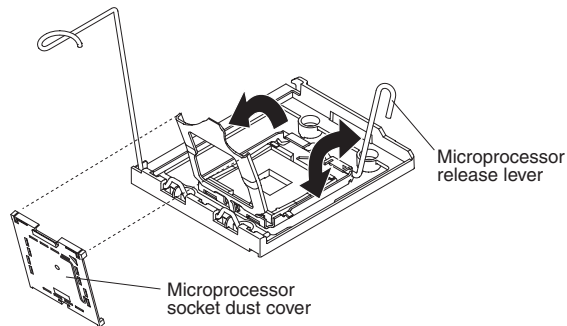


Attention:

- A startup (boot) microprocessor must always be installed in microprocessor connector 1 on the system board.
- To ensure proper server operation when you install an additional microprocessor, use microprocessors that have the same cache size and type, and the same clock speed. Microprocessor internal and external clock frequencies must be identical.

Complete the following steps to install an additional microprocessor:

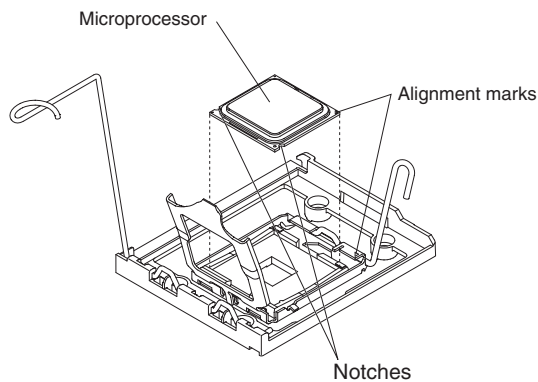
1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the server and disconnect all power cords and external cables (see “Turning off the server” on page 13); then, remove the server cover (see “Removing the cover” on page 26).
3. Remove the riser card (see “Removing the riser-card assembly” on page 26).
4. Remove the air baffle (see “Removing the air baffle” on page 29).
5. Locate the second microprocessor connector on the system board.
6. Install the microprocessor by completing the following steps:
 - a. Touch the static-protective package containing the microprocessor to any unpainted metal surface on the server. Then, remove the microprocessor from the package.



- b. Remove the protective dust cover, tape, or label from the surface of the microprocessor socket, if one is present.
- c. Rotate the microprocessor release lever on the socket from its closed and locked position until it stops or clicks in the fully open position.

Attention:

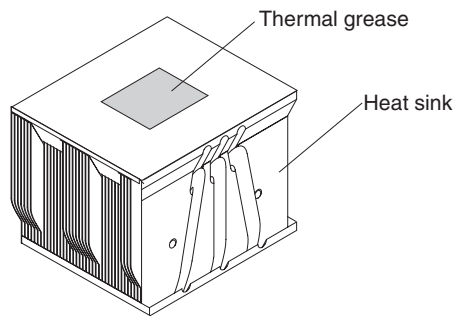
- Handle the microprocessor carefully. Dropping the microprocessor during installation or removal can damage the contacts. Also, contaminants on the microprocessor contacts, such as oil from your skin, can cause connection failures between the contacts and the socket.
 - Do not use excessive force when pressing the microprocessor into the socket
- d. Align the microprocessor with the socket (note the alignment mark and the position of the notches); then, carefully place the microprocessor on the socket. Close the microprocessor bracket frame.



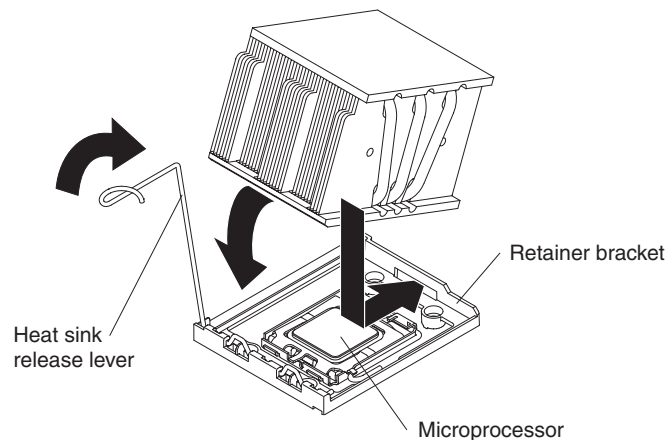
Note: The microprocessor fits only one way on the socket.

- e. Carefully close the microprocessor release lever to secure the microprocessor in the socket.
7. Install a heat sink on the microprocessor by completing the following steps.

Attention: Do not touch the thermal grease on the bottom of the heat sink or set down the heat sink after you remove the plastic cover. Touching the thermal grease will contaminate it. For details, see the information about thermal grease on page 51.



- Make sure that the heat-sink release lever is in the open position.
- Remove the plastic protective cover from the bottom of the heat sink.
- Align the heat sink above the microprocessor with the thermal-grease side down. Press firmly on the heat sink.



- Slide the rear flange of the heat sink into the opening in the retainer bracket.
- Press down firmly on the heat sink until it is seated securely.
- Rotate the heat-sink release lever to the closed position and hook it underneath the lock tab.

If you have other devices to install or remove, do so now. Otherwise, go to "Completing the installation" on page 61.

Installing a memory module

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

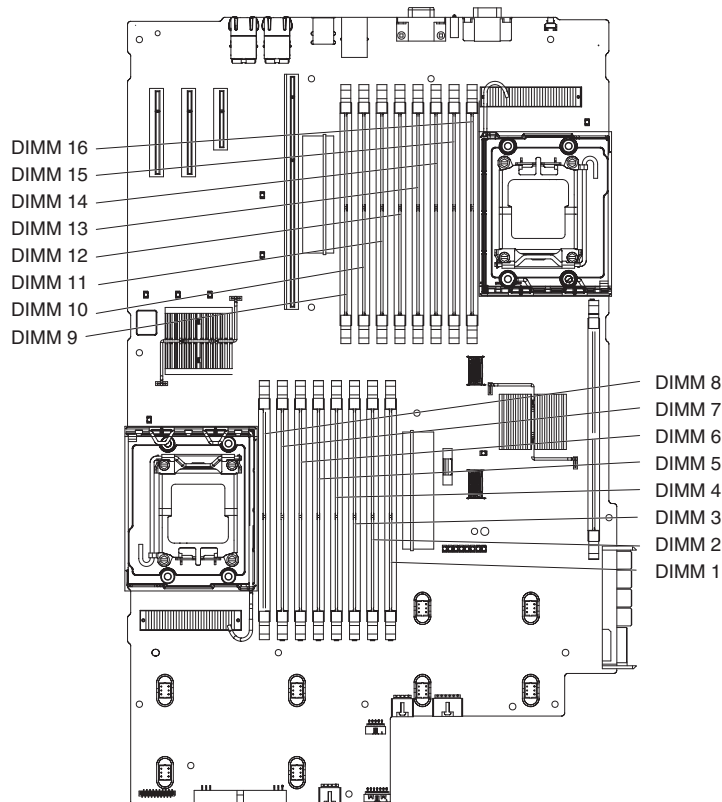
- The server supports up to 16 Registered DDR2 PC2-5300, 512 MB, 1 GB, 2GB, and 4 GB DIMMs, for a maximum of 64 GB of system memory. See <http://www.ibm.com/servers/eserver/serverproven/compat/us/> for a list of memory modules you can use with the server.

Note: Because some memory is reserved for system operation, the actual usable memory size reported by the operating system will be less than the total installed size.

- The server comes with a minimum of two 512 MB DIMMs, installed in slots 1 and 2. When installing additional DIMMs, you must install two identical DIMMS at a time, in the order shown in the following table, to maintain performance.

Table 3. DIMM installation sequence

DIMMs	1 microprocessor installed	2 microprocessors installed
2	DIMM connectors 1 and 2	Not applicable
4	DIMM connectors 1 through 4	DIMM connectors 1 and 2 and 9 and 10
6	DIMM connectors 1 through 6	DIMM connectors 1 through 4 and 9 and 10
8	DIMM connectors 1 through 8	DIMM connectors 1 through 4 and 9 through 12
10	Not applicable	DIMM connectors 1 through 6 and 9 through 12
12	Not applicable	DIMM connectors 1 through 6 and 9 through 14
14	Not applicable	DIMM connectors 1 through 8 and 9 through 14
16	Not applicable	DIMM connectors 1 through 16



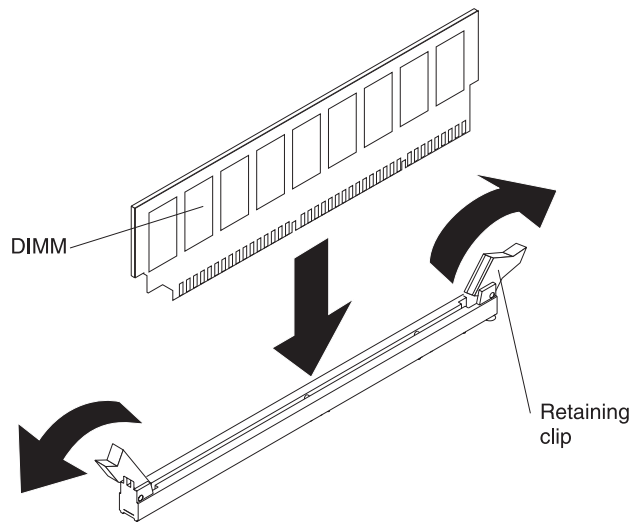
- Each DIMM in a pair must be the same size, speed, type, and technology to ensure that the server will operate properly.

- If you install two microprocessors in the server, at a minimum, you must install two DIMMs in slots 1 and 2 and two DIMMs in slot 9 and 10.
- The server supports online-spare memory. This feature disables a failed pair of DIMMs from the system configuration and activates an online-spare pair of DIMMs to replace the failed pair. Online-sparing is supported on a per processor basis. Each microprocessor requires that two or more pairs of DIMMs be installed to support online sparing. The DIMMs must be the same speed, type, size (or larger), and technology as the failed pair of DIMMs.

Enable online-spare memory through the Configuration/Setup Utility program. The BIOS code assigns the online-spare memory DIMM pairs according to your DIMM configuration.

- When you install or remove DIMMs, the server configuration information changes. When you restart the server, the system displays a message indicating that the memory configuration has changed.

To install a DIMM, complete the following steps.



To install a DIMM, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables. Remove the cover (see “Removing the cover” on page 26).
Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, open and close the clips gently.
3. Remove the riser-card assembly (see “Removing the riser-card assembly” on page 26).
4. Remove the air baffle (see “Removing the air baffle” on page 29).
5. Open the retaining clip on each end of the DIMM connector.
6. Touch the static-protective package that contains the DIMM to any unpainted metal surface on the server. Then, remove the DIMM from the package.
7. Turn the DIMM so that the DIMM key aligns correctly with the connector.
8. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is firmly seated in the connector.

Important: 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.

9. Replace the riser-card assembly (see “Installing the riser-card assembly” on page 28).

If you have other devices to install or remove, do so now. Otherwise, go to “Completing the installation” on page 61.

Installing a hot-swap power supply

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

Important: Only the configurations shown in the following table are supported:

Installed power supplies	Required fans
Power supply 1	Fans in locations 3, 4, 8, 9, and 10
Power supplies 1 and 2	All 10 fans

Statement 8:

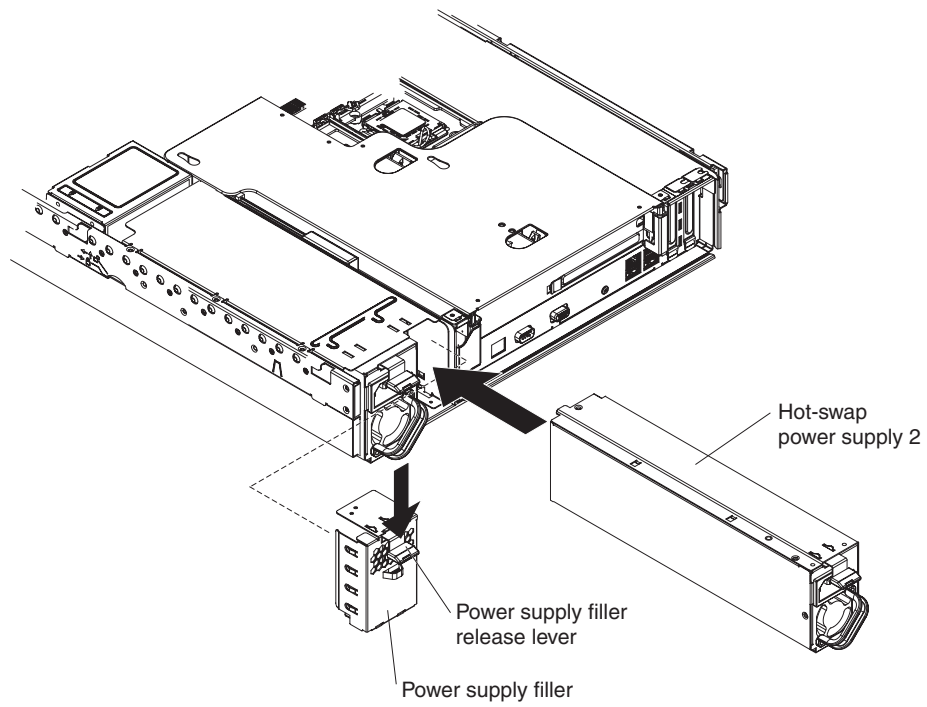


CAUTION:

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



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



To install a power supply, complete the following steps:

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Remove the power-supply blank from the empty power-supply bay by pinching the side clip and pulling the power-supply blank from the bay. Save the power-supply blank in case you remove the power supply at a later time.

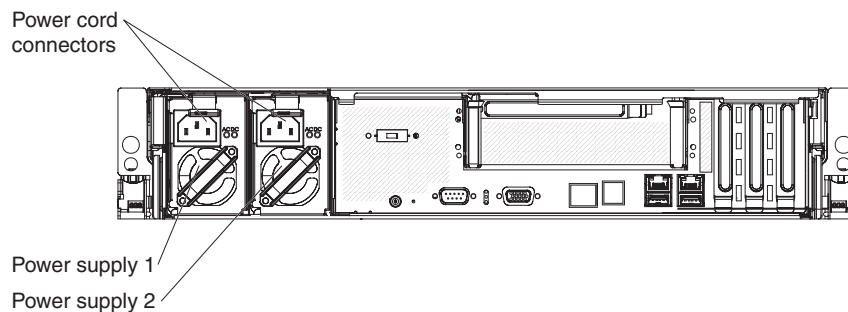
Important: During normal operation, each power-supply bay must have either a power supply or power-supply blank installed for proper cooling.

3. Slide the power supply into the bay until the retention latch clicks into place.
4. Remove the server cover and install the five cooling fans that came with the power supply option (see “Installing a fan”).

Important: When power supply 1 is installed, the five fans for power supply 1 occupy the rear row only (fans 3, 4, 8, 9, and 10); when both power supplies are installed, all 10 fans must be installed.

5. Install the cover (see “Installing the cover” on page 62).
6. Connect the power cord for the new power supply to the power-cord connector on the power supply.

The following illustration shows the power-supply connectors on the back of the server.



7. Route the power cord through any cable clamps on the rear of the server, to prevent the power cord from being accidentally pulled out when sliding the server in and out of the rack.
8. Connect the power cord to a properly grounded electrical outlet.
9. Make sure that the dc power LED and ac power LED on the power supply are lit, indicating that the power supply is operating correctly.

Installing a fan

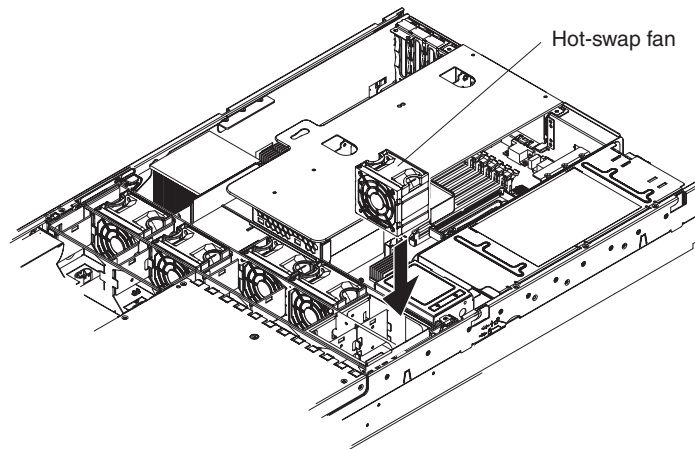
For proper cooling, the server requires five fans installed for each hot-swap power supply installed.

The server comes with five replaceable fans. If you install a second hot-swap power supply, you must install the set of five fans that come with the power-supply option.

Important: Only the configurations shown in the following table are supported:

Installed power supplies	Required fans
Power supply 1	Fans in locations 3, 4, 8, 9, and 10
Power supplies 1 and 2	All 10 fans

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



To install any of the 10 replaceable fans, complete the following steps:

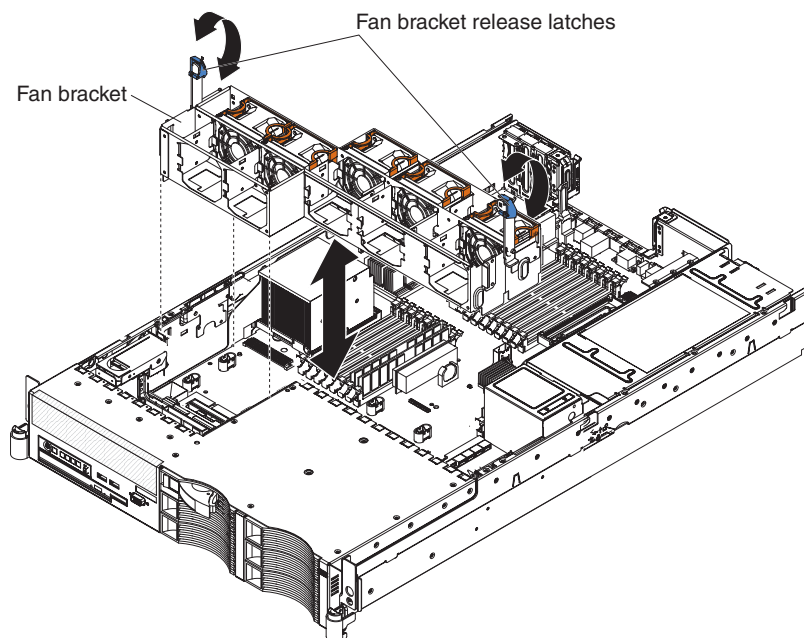
1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. If you have not done so already, slide the server out of the rack and remove the cover (see “Removing the cover” on page 26).

Attention: To ensure proper system cooling, do not remove the top cover for more than 2 minutes during this procedure.

3. Orient the new fan over its position in the fan assembly bracket so that the LED on top of the fan is toward the left side of the server.
4. Push the new fan into the fan assembly bracket until it clicks into place.
5. Repeat steps 3 and 4 until all the new fans are installed.
6. Replace the cover and slide the server into the rack.

Removing the fan-bracket assembly

To remove the fan-bracket assembly, complete the following steps:

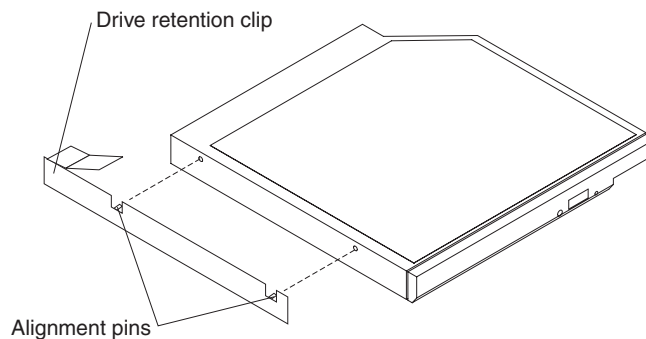


1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Turn off the server and peripheral devices, and disconnect the power cords and all external cables. Slide the server out of the rack and remove the cover (see “Removing the cover” on page 26).
3. Place your thumbs on the metal tabs of the fan-bracket-assembly levers and pinch the tab and blue release latch together; then, raise the levers, raising the fan-bracket assembly.
4. Grasp the levers and lift the fan-bracket assembly out of the server.

Installing the CD/DVD drive

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

1. Read the safety information that begins on page v and “Installation guidelines” on page 23.
2. Make sure that the server and peripheral devices are turned off, and that the power cords and all external cables are disconnected. Remove the server from the rack and remove the cover (see “Removing the cover” on page 26).
3. Follow the instructions that come with the drive to set any jumpers or switches.



4. Attach the drive retention clip to the side of the drive.
5. Slide the drive into the CD/DVD drive bay until the drive clicks into place.

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

Completing the installation

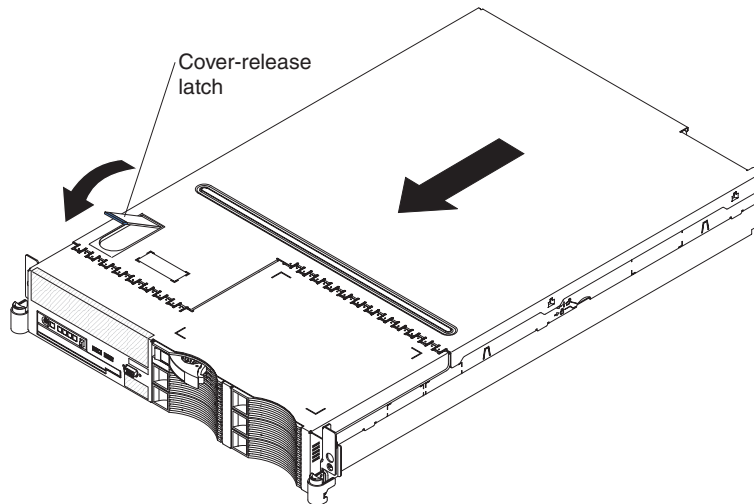
To complete the installation, complete the following steps:

1. If you removed any air baffles, replace the air baffles (see “Installing the air baffle” on page 30).
2. If you removed the riser-card assembly, replace the riser-card assembly (see “Installing the riser-card assembly” on page 28).
3. If you removed the server cover, replace the server cover (see “Installing the cover” on page 62).
4. Install the server in a rack. See the *Rack Installation Instructions* that come with the server for complete rack installation and removal instructions.

Attention:

- Install the server only in a rack cabinet with perforated doors.
 - Do not leave open spaces above or below an installed server in the rack cabinet. To help prevent damage to server components, always install a blank filler panel to cover the open space and to help ensure proper air circulation. See the documentation that comes with the rack cabinet for more information.
 - Install the server in a rack that meets the following requirements:
 - Minimum depth of 70 mm (2.8 in.) between the front mounting flange and the inside of the front door
 - Minimum depth of 157 mm (6.2 in.) between the rear mounting flange and the inside of the rear door
 - Minimum depth of 718 mm (28.3 in.) and maximum depth of 762 mm (30.0 in.) between the front and rear mounting flanges
5. To attach peripheral devices and connect the power cords, see “Connecting the cables.”

Installing the cover



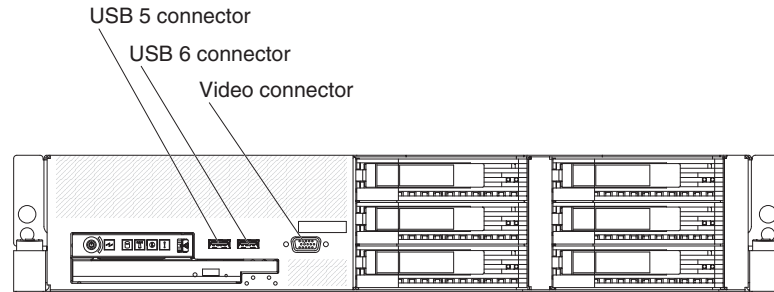
To install the cover, complete the following steps:

1. Place the cover-release latch in the open (up) position.
2. Insert the bottom tabs of the top cover into the matching slots in the server chassis.
3. Press down on the cover-release latch to lock the cover in place.
4. Slide the server into the rack.

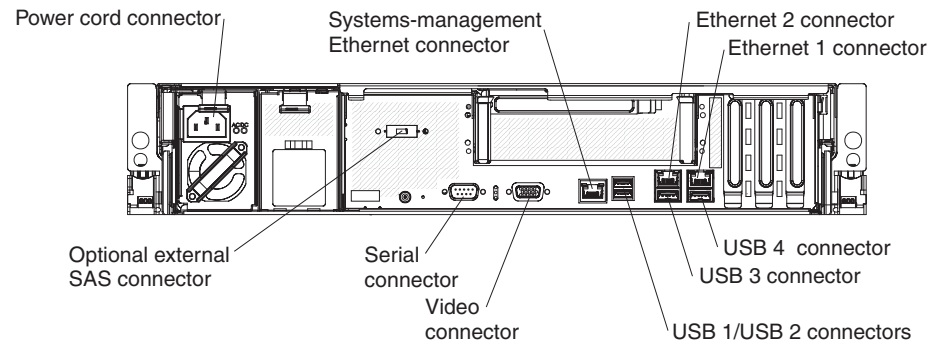
Connecting the cables

The following illustrations show the locations of the input and output connectors on the front and rear of the server.

Front view



Rear view



You must turn off the server before connecting or disconnecting cables from the server.

See the documentation that comes with any external devices for additional cabling instructions. It might be easier for you to route cables before you connect the devices to the server.

Cable identifiers are printed on the cables that come with the server and optional devices. Use these identifiers to connect the cables to the correct connectors.

If the server comes with an installed operating system, see the documentation that comes with the operating system for additional cabling instructions.

Updating the server configuration

When you start the server for the first time after you add or remove a 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 Chapter 3, “Configuring the server,” on page 65.

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

If you have installed or removed a hard disk drive, see “Using the IBM ServeRAID Configuration Utility program” on page 73 and “Using ServeRAID Manager” on page 75 for information about reconfiguring the disk arrays.

If you have installed a Remote Supervisor Adapter SlimLine to manage the server remotely, see the *Remote Supervisor Adapter 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 “Configuring the Gigabit Ethernet controllers” on page 88.

Chapter 3. Configuring the server

The following configuration programs and capabilities come with the server:

- **IBM ServerGuide Setup and InstallationCD**

The ServerGuide program provides software-setup tools and installation tools that are designed for the server. Use this CD during the installation of the server to configure basic hardware features and to simplify the installation of your operating system. For information about using this CD, see “Using the ServerGuide Setup and Installation CD” on page 71.

- **Configuration/Setup Utility program**

The Configuration/Setup Utility program is part of the basic input/output system (BIOS). Use it to configure serial port assignments, change interrupt request (IRQ) settings, change the startup-device sequence, set the date and time, and set passwords. For information about using this utility program, see “Using the Configuration/Setup Utility program” on page 66.

- **RAID configuration programs**

- **IBM ServeRAID Configuration Utility program**

Use the IBM ServeRAID Configuration Utility program to configure devices that are attached to the SAS controller. For information about using this program, see “Using the IBM ServeRAID Configuration Utility program” on page 73.

- **ServeRAID Manager**

ServeRAID Manager is available as a stand-alone program and as an IBM Director extension. Use ServeRAID Manager to define and configure your disk-array subsystem *before* you install the operating system. For information about using this program, see “Using ServeRAID Manager” on page 75.

- **Ethernet controller configuration**

For information about configuring the Ethernet controllers, see “Configuring the Gigabit Ethernet controllers” on page 88.

- **Baseboard management controller utility programs**

Use these programs to configure the baseboard management controller, to update the firmware and sensor data record/field replaceable unit (SDR/FRU) data, and to remotely manage a network. For information about using these programs, see “Using the baseboard management controller” on page 76.

- **IBM Director**

IBM Director is a workgroup-hardware-management tool that you can use to centrally manage System x and xSeries servers. If you plan to use IBM Director to manage the server, you must check for the latest applicable IBM Director updates and interim fixes. For information about updating IBM Director, see “Updating IBM Director” on page 89. For more information about IBM Director, see the IBM Director documentation on the *IBM Director* CD that comes with the server.

- **Remote Supervisor Adapter II SlimLine configuration**

For information about setting up and cabling the Remote Supervisor Adapter II SlimLine, see “Setting up a Remote Supervisor Adapter II SlimLine” on page 89.

- **Boot Menu program**

The Boot Menu program is part of the BIOS. Use it to temporarily assign a device to be first in the startup sequence, overriding the startup sequence that is set in the Configuration/Setup Utility program.

Using the Configuration/Setup Utility program

Use the Configuration/Setup Utility program to perform the following tasks:

- View configuration information
- View and change assignments for devices and I/O ports
- Set the date and time
- Set and change passwords
- Set the startup characteristics of the server and the order of startup devices (startup-drive sequence)
- Set and change settings for advanced hardware features
- View and clear the error and event logs
- Change interrupt request (IRQ) settings
- Enable USB legacy keyboard and mouse support
- Resolve configuration conflicts

Starting the Configuration/Setup Utility program

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

1. Turn on the server.
2. When the prompt Press F1 for Configuration/Setup appears, press F1. If you have set both a power-on password and an administrator password, you must type the administrator password to access the full Configuration/Setup Utility menu. If you do not type the administrator password, a limited Configuration/Setup Utility menu is available.
3. Select the settings to view or change.

Configuration/Setup Utility menu choices

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

- **USB Device Summary**

Select this choice to view information about the USB devices.

- **Processor Summary**

Select this choice to view information about the microprocessors.

- **System Information**

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

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

- **Product Data**

Select this choice to view the machine type and model of the server, the serial number, and the revision level or issue date of the BIOS, diagnostics, and EMC code that are stored in electrically erasable programmable ROM (EEPROM).

- **System Card Data**

Select this choice to view vital product data (VPD) for some server components.

- **Devices and I/O Ports**

Select this choice to view or change assignments for devices and input/output (I/O) ports.

Select this choice to enable or disable integrated SAS and Ethernet controllers and all standard ports (such as serial). Enable is the default setting for all controllers. If you disable a device, it cannot be configured, and the operating system will not be able to detect it (this is equivalent to disconnecting the device).

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

- **Remote Console Redirection**

Select this choice to enable Serial over LAN (SOL) and to set remote console communication parameters.

- **Video**

Select this choice to view information about the integrated video controller.

- **IDE Configuration Menu**

Select this choice to enable or disable the IDE controller.

- **System MAC Addresses**

Select this choice to view the Ethernet 1 controller and Ethernet 2 controller MAC addresses

- **Date and Time**

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

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

- **System Security**

Select this choice to set or change the security options.

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

- **Administrator Password**

Attention: If you set an administrator password and then forget it, there is no way to change, override, or remove it. You must replace the system board.

Select this choice to set or change an administrator password. An administrator password is intended to be used by a system administrator; it limits access to the full Configuration/Setup Utility menu. If an administrator password is set, the full Configuration/Setup Utility menu is available only if you type the administrator password at the password prompt. For more information, see “Administrator password” on page 71.

This choice is on the Configuration/Setup Utility menu only if a Remote Supervisor Adapter II SlimLine is installed.

- **Power-on Password**

Select this choice to set a power-on password. See “Power-on password” on page 70 for more information.

- **Start Options**

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

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

Select the **Startup Sequence Options** to view the startup device sequence that is set for the server.

You can specify whether the server starts with the keyboard number lock on or off. You can enable the server to run without a diskette drive, monitor, or keyboard.

The startup sequence specifies the order in which the server checks devices to find a boot record. The server starts from the first boot record that it finds. If the server has Wake on LAN hardware and software and the operating system supports Wake on LAN functions, you can specify a startup sequence for the Wake on LAN functions.

If you enable the boot fail count, the BIOS default settings will be restored after three consecutive failures to find a boot record.

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

You can enable the use of a USB legacy keyboard in a DOS or System Setup environment. If a keyboard is detected, the USB legacy operation will be disabled.

- **Advanced Setup**

Select this choice to change settings for advanced hardware features.

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

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

- **Memory Settings**

Select this choice to manually enable a pair of memory connectors, node interleaving, and Chipkill memory (if it is supported).

If a memory error is detected during POST or memory configuration, the server automatically disables the failing pair of memory connectors and continues operating with reduced memory. After the problem is corrected, you must enable the memory connectors. Use the arrow keys to highlight the pair of memory connectors that you want to enable, and use the arrow keys to select **Enable**.

- **CPU Options**

Select this choice to disable the microprocessor cache or to set the microprocessor cache to use the write-back or write-through method.

Write-back caching generally provides better system performance. Also select this choice to set the microprocessor power-management option. **Disable** is the default setting.

- **PCI Bus Control**

Select this choice to view and set interrupts for PCI devices and to configure the master-latency-timer (MLT) value for the server.

- **Baseboard Management Controller (BMC) Settings**

Select this choice to change BMC settings

- **BMC Network Configuration**

Select this choice to set the network addresses of the BMC.

- **BMC System Event Log**

Select this choice to view and clear BMC event log entries.

- **User Account Settings**

Select this choice to define user names and passwords for remote access to the BMC.

- **RSA II Settings**

Select this choice to view and change Remote Supervisor Adapter II SlimLine settings. Select **Save Values and Reboot RSA II** to save the changes that you have made in the settings and restart the Remote Supervisor Adapter II SlimLine.

This choice is on the Configuration/Setup Utility menu only if a Remote Supervisor Adapter II SlimLine is installed.

- **Event/Error Logs**

Select this choice to view and clear the POST error log and the system event/error log.

- **Post Error Log**

Select this choice to view the three most recent error codes and messages that were generated during POST. Select **Clear POST Error Log** to clear the POST error log.

- **System Event/Error Log**

Note: This choice is on the Configuration/Setup Utility menu only if a Remote Supervisor Adapter II SlimLine is installed.

Select this choice to view the error messages in the system event/error log. You can use the arrow keys to move between pages in the error log. Select **Clear System Event/Error Log** to clear the system event/error log.

The system event/error log contains all event and error messages that have been generated during POST by the systems-management interface handler and the service processor.

- **Save Settings**

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

- **Restore Settings**

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

- **Load Default Settings**

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

- **Load Default Settings**

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

- **Exit Setup**

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

Passwords

From the **System Security** choice, you can set, change, and delete a power-on password and an administrator password. The **System Security** choice is on the full Configuration/Setup menu only.

If you set only a power-on password, you must type the power-on password to complete the system startup; you have access to the full Configuration/Setup Utility menu.

An administrator password is intended to be used by a system administrator; it limits access to the full Configuration/Setup Utility menu. If you set only an administrator password, you do not have to type a password to complete the system startup, but you must type the administrator password to access the Configuration/Setup Utility menu.

If you set a power-on password for a user and an administrator password for a system administrator, you can type either password to complete the system startup. A system administrator who types the administrator password has access to the full Configuration/Setup Utility menu; the system administrator can give the user authority to set, change, and delete the power-on password. A user who types the power-on password has access to only the limited Configuration/Setup Utility menu; the user can set, change, and delete the power-on password, if the system administrator has given the user that authority.

Power-on password

If a power-on (user) password is set, you must type the power-on password to complete the system startup. You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for the password.

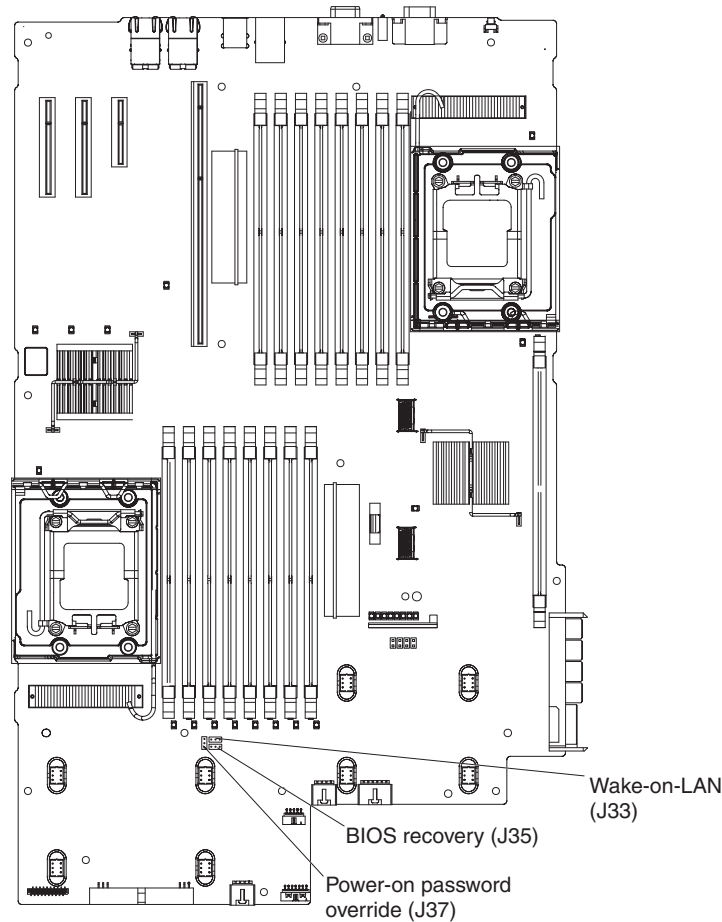
If a power-on password is set, you can enable the Unattended Start mode, in which the keyboard and mouse remain locked but the operating system can start. You can unlock the keyboard and mouse by typing the power-on password.

If you forget the power-on password, you can regain access to the server in any of the following ways:

- If an administrator password is set, type the administrator password at the password prompt (see “Administrator password” on page 71). Start the Configuration/Setup Utility program and reset the power-on password.
- Remove the battery from the server and then reinstall it. For instructions for removing the battery, see the *Problem Determination and Service Guide* on the IBM Documentation CD.
- Change the position of the power-on password override jumper (J37) on the system board to bypass the power-on password check. See “Passwords” on page 69 for additional information.

Attention: Before changing any switch settings or moving any jumpers, turn off the server; then, disconnect all power cords and external cables. See the safety information that begins on page v. Do not change settings or move jumpers on any switch or jumper block that is not shown in this document.

The following illustration shows the locations of the power-on password override, boot recovery, and Wake on LAN bypass jumpers.



While the server is turned off, move the jumper on J37 from pins 1 and 2 to pins 2 and 3. You can then start the Configuration/Setup Utility program and reset the power-on password. After you reset the password, turn off the server again and move the jumper back to pins 1 and 2.

The power-on password override switch does not affect the administrator password.

Administrator password

If an administrator password is set, you must type the administrator password for access to the full Configuration/Setup Utility menu. You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for the password. The Administrator Password choices on the Configuration/Setup Utility menu only if an optional IBM Remote Supervisor Adapter II SlimLine is installed.

Attention: If you set an administrator password and then forget it, there is no way to change, override, or remove it. You must replace the system board.

Using the ServerGuide Setup and Installation CD

The *ServerGuide Setup and Installation* CD contains a setup and installation program that is designed for your server. The ServerGuide program detects the server model and hardware devices that are installed and uses that information during setup to configure the hardware. The ServerGuide program simplifies operating-system installations by providing updated device drivers and, in some cases, installing them automatically.

If a later version of the ServerGuide program is available, you can download a free image of the *ServerGuide Setup and Installation* CD, or you can purchase the CD. To download the image, go to the IBM ServerGuide Web page at <http://www.ibm.com/pc/qtechinfo/MIGR-4ZKPPT.html>. To purchase the latest *ServerGuide Setup and Installation* CD, go to the ServerGuide fulfillment Web site at http://www.ibm.com/servers/eserver/xseries/systems_management/sys_migration/serverguide/sub.html.

The ServerGuide program has the following features:

- An easy-to-use interface
- Diskette-free setup, and configuration programs that are based on detected hardware
- ServeRAID Manager program, which configures your ServeRAID adapter
- Device drivers that are provided for your server model and detected hardware
- Operating-system partition size and file-system type that are selectable during setup

ServerGuide features

Features and functions can vary slightly with different versions of the ServerGuide program. To learn more about the version that you have, start the *ServerGuide Setup and Installation* CD and view the online overview. Not all features are supported on all server models.

The ServerGuide program requires a supported IBM server with an enabled startable (bootable) CD drive. In addition to the *ServerGuide Setup and Installation* CD, you must have your operating-system CD to install the operating system.

The ServerGuide program performs the following tasks:

- Sets system date and time
- Detects the RAID adapter or controller and runs the SAS RAID configuration program
- Checks the microcode (firmware) levels of a ServeRAID adapter and determines whether a later level is available from the CD
- Detects installed optional hardware devices and provides updated device drivers for most adapters and devices
- Provides diskette-free installation for supported Windows operating systems
- Includes an online readme file with links to tips for your hardware and operating-system installation

Setup and configuration overview

When you use the *ServerGuide Setup and Installation* CD, you do not need setup diskettes. You can use the CD to configure any supported IBM server model. The setup program provides a list of tasks that are required to set up your server model. On a server with a ServeRAID adapter or SAS/SATA controller with RAID capabilities, you can run the SAS RAID configuration program to create logical drives.

Note: Features and functions can vary slightly with different versions of the ServerGuide program.

When you start the *ServerGuide Setup and Installation* CD, the program prompts you to complete the following tasks:

- Select your language.
- Select your keyboard layout and country.
- View the overview to learn about ServerGuide features.
- View the readme file to review installation tips for your operating system and adapter.
- Start the operating-system installation. You will need your operating-system CD.

Typical operating-system installation

The ServerGuide program can reduce the time it takes to install an operating system. It provides the device drivers that are required for your hardware and for the operating system that you are installing. This section describes a typical ServerGuide operating-system installation.

Note: Features and functions can vary slightly with different versions of the ServerGuide program.

1. After you have completed the setup process, the operating-system installation program starts. (You will need your operating-system CD to complete the installation.)
2. The ServerGuide program stores information about the server model, service processor, hard disk drive controllers, and network adapters. Then, the program checks the CD for newer device drivers. This information is stored and then passed to the operating-system installation program.
3. The ServerGuide program presents operating-system partition options that are based on your operating-system selection and the installed hard disk drives.
4. The ServerGuide program prompts you to insert your operating-system CD and restart the server. At this point, the installation program for the operating system takes control to complete the installation.

Installing your operating system without ServerGuide

If you have already configured the server hardware and you are not using the ServerGuide program to install your operating system, complete the following steps to download the latest operating-system installation instructions from the IBM Web site.

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

1. Go to <http://www.ibm.com/servers/eserver/support/xseries/index.html>.
2. From the **Hardware** list, select **System x3655** and click **Go**.
3. Click the **Install and use** tab.
4. Click **Product documentation**.
5. Select the installation instructions for your operating system.

Using the IBM ServeRAID Configuration Utility program

Use the Adaptec RAID Configuration Utility programs to perform the following tasks:

- Configure a redundant array of independent disks (RAID) array
- View or change the RAID configuration and associated devices

When you are using the Adaptec RAID Configuration Utility programs to configure and manage arrays, consider the following information:

- Hard disk drive capacities affect how you create arrays. Drives in an array can have different capacities, but the RAID controller treats them as if they all have the capacity of the smallest hard disk drive.
- To help ensure signal quality, do not mix drives with different speeds and data rates.
- To update the firmware and BIOS code for an optional ServeRAID controller, you must use the IBM *ServeRAID Support* CD that comes with the ServeRAID option.
- If you install a different type of RAID controller (adapter) in the server, use the method that is described in the instructions that come with the adapter to view or change SAS settings for attached devices.

Starting the IBM ServeRAID Configuration Utility menu choices

To start the IBM ServeRAID Configuration Utility program, complete the following steps:

1. Turn on the server.
2. When the prompt <<< Press <CTRL><A> for IBM ServeRAID Configuration Utility! >>> appears, press Ctrl+A. If you have set an administrator password, you are prompted to type the password.
3. To select a choice from the menu (see “IBM ServeRAID Configuration Utility menu choices”), use the arrow keys.
4. Use the arrow keys to select the channel for which you want to change settings.
5. To change the settings of the selected items, follow the instructions on the screen.

IBM ServeRAID Configuration Utility menu choices

The following choices are on the IBM ServeRAID Configuration Utility menu:

- **Array Configuration Utility**
Select this choice to create, manage, or delete arrays, or to initialize drives.
- **SerialSelect Utility**
Select this choice to configure the controller interface definitions or to configure the physical transfer and SAS address of the selected drive.
- **Disk Utilities**
Select this choice to format a disk or verify the disk media. Select a device from the list and read the instructions on the screen carefully before making a selection.

Configuring the controller

To configure a RAID array on the server, complete the following steps:

1. Turn on the server.
2. When the message Press <CTRL><A> for IBM ServeRAID Configuration Utility appears, press Ctrl+A.
3. Select **Array Configuration Utility**.
4. Select **Create Array**.
5. From the list of ready drives, select the drives that you want to group into the array.
6. From the list of RAID levels available, select the one you want to use, such as **RAID-1**.
7. (Optional) Type an identifier for the array.
8. When you are prompted for the array build method, select **Quick Init**.

9. Follow the instructions on the screen to complete the configuration; then, select **Done** to exit.
10. Restart the server.

Viewing the configuration

To view information about the RAID array, complete the following steps:

1. Turn on the server.
2. When the message Press <CTRL><A> for IBM ServeRAID Configuration Utility appears, press Ctrl+A.
3. Select **Array Configuration Utility**.
4. Select **Manage Arrays**.
5. Select an array and press Enter.
6. To exit from the program, press Esc.

Using ServeRAID Manager

Use ServeRAID Manager, which is on the *IBM ServeRAID Support CD*, to perform the following tasks:

- Configure a redundant array of independent disks (RAID) array
- Erase all data from a hard disk drive and return the disk to the factory-default settings
- View the RAID configuration and associated devices
- Monitor the operation of the RAID controller

To perform some tasks, you can run ServeRAID Manager as an installed program. However, to configure the SAS and RAID controllers and perform an initial RAID configuration on the server, you must run ServeRAID Manager in Startable CD mode, as described in the instructions in this section.

For additional information about RAID technology and instructions for using ServeRAID Manager to configure the SAS and RAID controllers, see the ServeRAID documentation on the *IBM ServeRAID Support CD*. Additional information about ServeRAID Manager is also available from the **Help** menu. For information about a specific object in the ServeRAID Manager tree, select the object and click **Actions --> Hints and tips**.

Configuring the RAID controller

By running ServeRAID Manager in Startable CD mode, you can configure the RAID controller before you install the operating system. The information in this section assumes that you are running ServeRAID Manager in Startable CD mode.

To run ServeRAID Manager in Startable CD mode, turn on the server; then, insert the CD into the CD-RW/DVD drive. If ServeRAID Manager detects an unconfigured controller and ready drives, the Configuration wizard starts.

In the Configuration wizard, you can select express configuration or custom configuration. Express configuration automatically configures the controller by grouping the first two physical drives in the ServeRAID Manager tree into an array and creating a RAID level-1 logical drive. If you select custom configuration, you can select the two physical drives that you want to group into an array and create a hot-spare drive.

Using express configuration

Complete the following steps to use express configuration:

1. In the ServeRAID Manager tree, click the controller.
2. Click **Express configuration**.
3. Click **Next**. The “Configuration summary” window opens.
4. Review the information in the “Configuration summary” window. To change the configuration, click **Modify arrays**.
5. Click **Apply**; then, click **Yes** when asked if you want to apply the new configuration. The configuration is saved in the controller and in the physical drives.
6. Exit from ServeRAID Manager and remove the CD from the DVD-ROM drive.
7. Restart the server.

Using custom configuration

To use custom configuration, complete the following steps:

1. In the ServeRAID Manager tree, click the controller.
2. Click **Custom configuration**.
3. Click **Next**.
4. In the “Create arrays” window, from the list of ready drives, select the two drives that you want to group into the array.
5. Click the (Add selected drives) icon to add the drives to the array.
6. If you want to configure a hot-spare drive, complete the following steps:
 - a. Click the **Spares** tab.
 - b. Select the physical drive that you want to designate as the hot-spare drive, and click the (Add selected drives) icon.
7. Click **Next**.
8. Review the information in the “Configuration summary” window. To change the configuration, click **Back**.
9. Click **Apply**; when you are asked whether you want to apply the new configuration, click **Yes**. The configuration is saved in the controller and in the physical drives.
10. Exit from ServeRAID Manager and remove the CD from the CD-RW/DVD drive.
11. Restart the server.

Viewing the configuration

You can use ServeRAID Manager to view information about RAID controllers and the RAID subsystem (such as arrays, logical drives, hot-spare drives, and physical drives). When you click an object in the ServeRAID Manager tree, information about that object appears in the right pane. To display a list of available actions for an object, click the object and click **Actions**.

Using the baseboard management controller

The baseboard management controller provides basic service-processor environmental monitoring functions for the server. If an environmental condition exceeds a threshold or if a system component fails, the baseboard management controller lights LEDs to help you diagnose the problem and also records the error in the BMC system event log.

The baseboard management controller also provides the following remote server management capabilities through the OSA SMBridge management utility program:

- **Command-line interface (IPMI Shell)**

The command-line interface provides direct access to server management functions through the IPMI protocol. Use the command-line interface to issue commands to control the server power, view system information, and identify the server. You can also save one or more commands as a text file and run the file as a script.

- **Serial over LAN**

Establish a Serial over LAN (SOL) connection to manage servers from a remote location. You can remotely view and change the BIOS settings, restart the server, identify the server, and perform other management functions. Any standard Telnet client application can access the SOL connection.

Enabling and configuring SOL using the OSA SMBridge management utility program

To enable and configure the server for SOL by using the OSA SMBridge management utility program, you must update and configure the BIOS code; update and configure the baseboard management controller (BMC) firmware; update and configure the Ethernet controller firmware; and enable the operating system for an SOL connection.

BIOS update and configuration

To update and configure the BIOS code to enable SOL, complete the following steps:

1. Update the BIOS code:
 - a. Download the latest version of the BIOS code from <http://www.ibm.com/servers/eserver/support/xseries/index.html>
 - b. Update the BIOS code, following the instructions that come with the update file that you downloaded.
2. Update the BMC firmware:
 - a. Download the latest version of the BMC firmware from <http://www.ibm.com/servers/eserver/support/xseries/index.html>
 - b. Update the BMC firmware, following the instructions that come with the update file that you downloaded.
3. Configure the BIOS settings:
 - a. When you are prompted to start the Configuration/Setup Utility program, restart the server and press F1.
 - b. Select **Devices and I/O Ports**; then, make sure that the values are set as follows:
 - **Serial Port A**: Auto-configure
 - **Serial Port B**: Auto-configure
 - c. Select **Remote Console Redirection**; then, make sure that the values are set as follows:
 - **Remote Console Active**: Enabled
 - **Remote Console COM Port**: COM 1
 - **Remote Console Baud Rate**: 19200 or higher
 - **Remote Console Data Bits**: 8
 - **Remote Console Parity**: None
 - **Remote Console Stop Bits**: 1

- **Remote Console Text Emulation:** ANSI
 - **Remote Console Keyboard Emulation:** ANSI
 - **Remote Console Active After Boot:** Enabled
 - **Remote Console Flow Control:** Hardware
- d. Press Esc twice to exit the **Remote Console Redirection** and **Devices and I/O Ports** sections of the Configuration/Setup Utility program.
 - e. Select **Advanced Setup**; then, select **Baseboard Management Controller (BMC) Settings**.
 - f. Set **BMC Serial Port Access Mode** to **Dedicated**.
 - g. Press Esc twice to exit the **Baseboard Management Controller (BMC) Settings** and **Advanced Setup** sections of the Configuration/Setup Utility program.
 - h. Select **Save Settings**; then, press Enter.
 - i. Press Enter to confirm.
 - j. Select **Exit Setup**; then, press Enter.
 - k. Make sure that **Yes, exit the Setup Utility** is selected; then, press Enter.

Linux configuration

For SOL operation on the server, you must configure the Linux® operating system to expose the Linux initialization (booting) process. This enables users to log in to the Linux console through an SOL session and directs Linux output to the serial console. See the documentation for your specific Linux operating-system type for information and instructions.

Use one of the following procedures to enable SOL sessions for your Linux operating system. You must be logged in as a root user to perform these procedures.

Red Hat Enterprise Linux ES 4 configuration:

Note: This procedure is based on a default installation of Red Hat Enterprise Linux ES 4. The file names, structures, and commands might be different for other versions of Red Hat Linux.

To configure the general Linux parameters for SOL operation when you are using the Red Hat Enterprise Linux ES 4 operating system, complete the following steps.

Note: Hardware flow control prevents character loss during communication over a serial connection. You must enable it when you are using a Linux operating system.

1. Add the following line to the end of the # Run gettys in standard runlevels section of the /etc/inittab file. This enables hardware flow control and enables users to log in through the SOL console.
7:2345:respawn:/sbin/agetty -h ttyS0 19200 vt102
2. Add the following line at the bottom of the /etc/securetty file to enable a user to log in as the root user through the SOL console:
ttyS0

LILO configuration: If you are using LILO, complete the following steps:

1. Modify the /etc/lilo.conf file:
 - a. Add the following text to the end of the first default=linux line
-Monitor

- b. Comment out the `map=/boot/map` line by adding a `#` at the beginning of this line.
- c. Comment out the `message=/boot/message` line by adding a `#` at the beginning of this line.
- d. Add the following line before the first `image=` line:
`# This will allow you to only Monitor the OS boot via SOL`
- e. Add the following text to the end of the first `label=linux` line:
`-Monitor`
- f. Add the following line to the first `image=` section. This enables SOL.
`append="console=ttyS0,19200n8 console=tty1"`
- g. Add the following lines between the two `image=` sections:
`# This will allow you to Interact with the OS boot via SOL`
`image=/boot/vmlinuz-2.4.9-e.12smp`
`label=linux-Interact`
`initrd=/boot/initrd-2.4.9-e.12smp.img`
`read-only`
`root=/dev/hda6`
`append="console=tty1 console=ttyS0,19200n8 "`

The following examples show the original content of the `/etc/lilo.conf` file and the content of this file after modification.

Original `/etc/lilo.conf` contents

```
prompt
timeout=50
default=linux
boot=/dev/hda
map=/boot/map
install=/boot/boot.b
message=/boot/message
linear
image=/boot/vmlinuz-2.4.9-e.12smp
    label=linux
    initrd=/boot/initrd-2.4.9-e.12smp.img
    read-only
    root=/dev/hda6
image=/boot/vmlinuz-2.4.9-e.12
    label=linux-up
    initrd=/boot/initrd-2.4.9-e.12.img
    read-only
    root=/dev/hda6
```

Modified /etc/lilo.conf contents

```
prompt
timeout=50
default=linux-Monitor
boot=/dev/hda
#map=/boot/map
install=/boot/boot.b
#message=/boot/message
linear
# This will allow you to only Monitor the OS boot via SOL
image=/boot/vmlinuz-2.4.9-e.12smp
    label=linux-Monitor
    initrd=/boot/initrd-2.4.9-e.12smp.img
    read-only
    root=/dev/hda6
    append="console=ttyS0,19200n8 console=tty1"
# This will allow you to Interact with the OS boot via SOL
image=/boot/vmlinuz-2.4.9-e.12smp
    label=linux-Interact
    initrd=/boot/initrd-2.4.9-e.12smp.img
    read-only
    root=/dev/hda6
    append="console=tty1 console=ttyS0,19200n8 "
image=/boot/vmlinuz-2.4.9-e.12
    label=linux-up
    initrd=/boot/initrd-2.4.9-e.12.img
    read-only
    root=/dev/hda6
```

2. Run the **lilo** command to store and activate the LILO configuration.

When the Linux operating system starts, a LILO boot: prompt is displayed instead of the graphical user interface. Press Tab at this prompt to install all of the boot options that are listed. To load the operating system in interactive mode, type linux-Interact and then press Enter.

GRUB configuration: If you are using GRUB, modify the /boot/grub/grub.conf file:

1. Comment out the splashimage= line by adding a # at the beginning of this line.
2. Add the following line before the first title= line:
This will allow you to only Monitor the OS boot via SOL
3. Append the following text to the first title= line:
SOL Monitor
4. Append the following text to the kernel/ line of the first title= section:
console=ttyS0,19200 console=tty1
5. Add the following five lines between the two title= sections:
This will allow you to Interact with the OS boot via SOL
title Red Hat Linux (2.4.9-e.12smp) SOL Interactive
 root (hd0,0)
kernel /vmlinuz-2.4.9-e.12smp ro root=/dev/hda6 console=tty1

```
console=ttyS0,19200
initrd /initrd-2.4.9-e.12smp.img
```

Note: The entry that begins with `kernel /vmlinuz` is shown with a line break after `console=tty1`. In your file, the entire entry must all be on one line.

The following examples show the original content of the `/boot/grub/grub.conf` file and the content of this file after modification.

Original <code>/boot/grub/grub.conf</code> contents

<pre>#grub.conf generated by anaconda # # Note that you do not have to rerun grub after making changes to this file # NOTICE: You have a /boot partition. This means that # all kernel and initrd paths are relative to /boot/, eg. # root (hd0,0) # kernel /vmlinuz-version ro root=/dev/hda6 # initrd /initrd-version.img #boot=/dev/hda default=0 timeout=10 splashimage=(hd0,0)/grub/splash.xpm.gz title Red Hat Enterprise Linux ES (2.4.9-e.12smp) root (hd0,0) kernel /vmlinuz-2.4.9-e.12smp ro root=/dev/hda6 initrd /initrd-2.4.9-e.12smp.img title Red Hat Enterprise Linux ES-up (2.4.9-e.12) root (hd0,0) kernel /vmlinuz-2.4.9-e.12 ro root=/dev/hda6 initrd /initrd-2.4.9-e.12.img</pre>
--

Modified /boot/grub/grub.conf contents

```
#grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE: You have a /boot partition. This means that
#         all kernel and initrd paths are relative to /boot/, eg.
#         root (hd0,0)
#         kernel /vmlinuz-version ro root=/dev/hda6
#         initrd /initrd-version.img
#boot=/dev/hda
default=0
timeout=10
# splashimage=(hd0,0)/grub/splash.xpm.gz
# This will allow you to only Monitor the OS boot via SOL
title Red Hat Enterprise Linux ES (2.4.9-e.12smp) SOL Monitor
    root (hd0,0)
    kernel /vmlinuz-2.4.9-e.12smp ro root=/dev/hda6 console=ttyS0,19200 console=tty1
    initrd /initrd-2.4.9-e.12smp.img
# This will allow you to Interact with the OS boot via SOL
title Red Hat Linux (2.4.9-e.12smp) SOL Interactive
    root (hd0,0)
    kernel /vmlinuz-2.4.9-e.12smp ro root=/dev/hda6 console=tty1 console=ttyS0,19200
    initrd /initrd-2.4.9-e.12smp.img
title Red Hat Enterprise Linux ES-up (2.4.9-e.12)
    root (hd0,0)
    kernel /vmlinuz-2.4.9-e.12 ro root=/dev/hda6
    initrd /initrd-2.4.9-e.12.img
```

You must restart the Linux operating system after you complete these procedures for the changes to take effect and to enable SOL.

SUSE SLES 9.0 configuration:

Note: This procedure is based on a default installation of SUSE Linux Enterprise Server (SLES) 9.0. The file names, structures, and commands might be different for other versions of SUSE LINUX.

Configure the general Linux parameters for SOL operation when using the SLES 9.0 operating system.

Note: Hardware flow control prevents character loss during communication over a serial connection. You must enable it when using a Linux operating system.

1. Add the following line to the end of the # getty-programs for the normal runlevels section of the /etc/inittab file. This enables hardware flow control and enables users to log in through the SOL console.
7:2345:respawn:/sbin/agetty -h ttyS0 19200 vt102
2. Add the following line after the tty6 line at the bottom of the /etc/securetty file to enable a user to log in as the root user through the SOL console:
ttyS0

3. Modify the `/boot/grub/menu.lst` file:
 - a. Comment out the `gfxmenu` line by adding a `#` in front of the word `gfxmenu`.
 - b. Add the following line before the first title line:
`# This will allow you to only Monitor the OS boot via SOL`
 - c. Append the following text to the first title line:
`SOL Monitor`
 - d. Append the following text to the kernel line of the first title section:
`console=ttyS1,19200 console=tty0`
 - e. Add the following four lines between the first two title sections:
`# This will allow you to Interact with the OS boot via SOL`
`title linux SOL Interactive`
`kernel (hd0,1)/boot/vmlinuz root=/dev/hda2 acpi=oldboot vga=791`
`console=tty1 console=ttyS0,19200`
`initrd (hd0,1)/boot/initrd`

The following examples show the original content of the `/boot/grub/menu.lst` file and the content of this file after modification.

Original <code>/boot/grub/menu.lst</code> contents	Notes
<pre>gfxmenu (hd0,1)/boot/message color white/blue black/light-gray default 0 timeout 8 title linux kernel (hd0,1)/boot/vmlinuz root=/dev/hda2 acpi=oldboot vga=791 initrd (hd0,1)/boot/initrd title floppy root chainloader +l title failsafe kernel (hd0,1)/boot/vmlinuz.shipped root=/dev/hda2 ide=nodma apm=off vga=normal nosmp disablepic maxcpus=0 3 initrd (hd0,1)/boot/initrd.shipped</pre>	<p>1</p> <p>1</p>
Note 1: The kernel line is shown with a line break. In your file, the entire entry must all be on one line.	

Modified <code>/boot/grub/menu.lst</code> contents	Notes
<pre>#gfxmenu (hd0,1)/boot/message color white/blue black/light-gray default 0 timeout 8 # This will allow you to only Monitor the OS boot via SOL title linux SOL Monitor kernel (hd0,1)/boot/vmlinuz root=/dev/hda2 acpi=oldboot vga=791 console=ttyS1,19200 console=tty1 initrd (hd0,1)/boot/initrd # This will allow you to Interact with the OS boot via SOL title linux SOL Interactive kernel (hd0,1)/boot/vmlinuz root=/dev/hda2 acpi=oldboot vga=791 console=tty1 console=ttyS0,19200 initrd (hd0,1)/boot/initrd</pre>	<p>1</p>

Modified /boot/grub/menu.lst contents	Notes
<pre> title floppy root chainloader +1 title failsafe kernel (hd0,1)/boot/vmlinuz.shipped root=/dev/hda2 ide=nodma apm=off vga=normal nosmp disableapic maxcpus=0 3 initrd (hd0,1)/boot/initrd.shipped </pre>	1
Note 1: The kernel line is shown with a line break. In your file, the entire entry must all be on one line.	

You must restart the Linux operating system after completing these procedures for the changes to take effect and to enable SOL.

Microsoft Windows 2003 Standard Edition configuration

Note: This procedure is based on a default installation of the Microsoft Windows 2003 operating system.

To configure the Windows 2003 operating system for SOL operation, complete the following steps. You must be logged in as a user with administrator access to perform this procedure.

1. Determine which boot entry ID to modify:
 - a. Type `bootcfg` at a Windows command prompt; then, press Enter to display the current boot options for your server.
 - b. In the Boot Entries section, locate the boot entry ID for the section with an OS friendly name of Windows Server 2003, Standard. Write down the boot entry ID for use in the next step.
2. To enable the Microsoft Windows Emergency Management System (EMS), at a Windows command prompt, type

```
bootcfg /EMS ON /PORT COM1 /BAUD 19200 /ID boot_id
```

where *boot_id* is the boot entry ID from step 1b; then, press Enter.
3. Verify that the EMS console is redirected to the COM1 serial port:
 - a. Type `bootcfg` at a Windows command prompt; then, press Enter to display the current boot options for your server.
 - b. Verify the following changes to the bootcfg settings:
 - In the Boot Loader Settings section, make sure that `redirect` is set to COM1 and that `redirectbaudrate` is set to 19200.
 - In the Boot Entries section, make sure that the OS Load Options: line has `/redirect` appended to the end of it.

The following examples show the original bootcfg program output and the output after modification.

Original bootcfg program output

```
Boot Loader Settings
-----
timeout: 30
default: multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
Boot Entries
-----
Boot entry ID: 1
OS Friendly Name: Windows Server 2003, Standard
Path: multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
OS Load Options: /fastdetect
```

Modified bootcfg program output

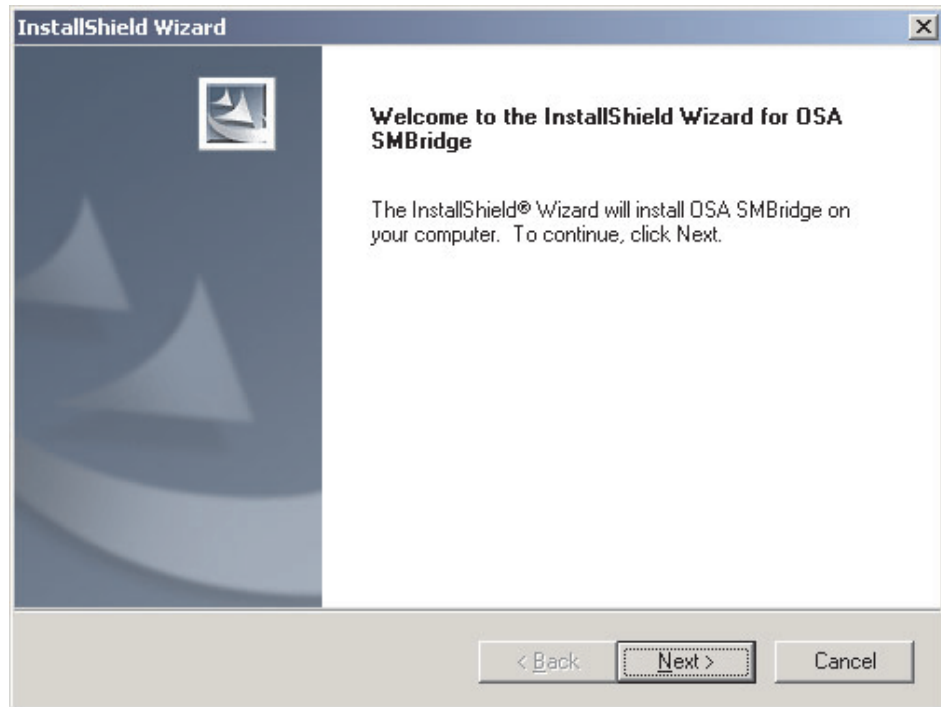
```
Boot Loader Settings
-----
timeout: 30
default: multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
redirect: COM1
redirectbaudrate: 19200
Boot Entries
-----
Boot entry ID: 1
OS Friendly Name: Windows Server 2003, Standard
Path: multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
OS Load Options: /fastdetect /redirect
```

You must restart the Windows 2003 operating system after you complete this procedure for the changes to take effect and to enable SOL.

Installing the OSA SMBridge management utility program

Complete the following steps to install the OSA SMBridge management utility program on a server running a Windows operating system:

1. Go to <http://www.ibm.com/support/> and download the utility program and create the OSA BMC Management Utility CD.
2. Insert the OSA BMC Management Utility CD into the drive. The InstallShield wizard starts, and a window similar to that shown in the following illustration opens.



3. Follow the prompts to complete the installation.

The installation program prompts you for a TCP/IP port number and an IP address. Specify an IP address, if you want to limit the connection requests that will be accepted by the utility program. To accept connections from any server, type `INADDR_ANY` as the IP address. Also specify the port number that the utility program will use. These values will be recorded in the `smbridge.cfg` file for the automatic startup of the utility program.

To install the OSA SMBridge management utility program on a server running a Linux operating system, complete the following steps. You must be logged in as a root user to perform these procedures.

1. Go to <http://www.ibm.com/servers/eserver/support/xseries/index.html>. Download the utility program and create the OSA BMC Management Utility CD.
2. Insert the OSA BMC Management Utility CD into the drive.
3. Type `mount/mnt/cdrom`.
4. Locate the directory where the installation RPM package is located and type `cd/mnt/cdrom`.
5. Type the following command to run the RPM package and start the installation:
`rpm -ivh smbridge-2.0-xx.rpm`

where `xx` is the release level being installed.

6. Follow the prompts to complete the installation. When the installation is complete, the utility copies files to the following directories:
`/etc/init.d/SMBridge`
`/etc/smbridge.cfg`
`/usr/sbin/smbridged`
`/var/log/smbridge/License.txt`
`/var/log/smbridge/Readme.txt`

The utility starts automatically when the server is started. You can also locate the `/etc/init.d` directory to start the utility and use the following commands to manage the utility:

```
smbridge status
smbridge start
smbridge stop
smbridge restart
```

Using the baseboard management controller utility programs

Use the baseboard management controller utility programs to configure the baseboard management controller, download firmware updates and sensor data record/field replaceable unit (SDR/FRU) updates, and remotely manage a network.

Using the baseboard management controller configuration utility program

Use the baseboard management controller configuration utility program to view or change the baseboard management controller configuration settings. You can also use the utility program to save the configuration to a file for use on multiple servers.

Note: You must attach an optional USB diskette drive to the server to run this program.

To start the baseboard management controller configuration utility program, complete the following steps:

1. Insert the configuration utility diskette into the diskette drive and restart the server.
2. From a command-line prompt, type `bmc_cfg` and press Enter.
3. Follow the instructions on the screen.

Using the baseboard management controller firmware update utility program

Use the baseboard management controller firmware update utility program to download and apply a baseboard management controller firmware update and SDR/FRU data update. The firmware update utility program updates the baseboard management controller firmware and SDR/FRU data only and does not affect any device drivers.

Note: To ensure proper server operation, be sure to update the server baseboard management controller firmware before you update the BIOS code.

To update the firmware, if the Linux or Windows operating-system update package is available from the World Wide Web and you have obtained the applicable update package, follow the instructions that come with the update package.

Using the OSA SMBridge management utility program

Use the OSA SMBridge management utility program to remotely manage and configure a network. The utility program provides the following remote management capabilities:

- **CLI (command-line interface) mode**

Use CLI mode to remotely perform power-management and system identification control functions over a LAN or serial port interface from a command-line interface. Use CLI mode also to remotely view the BMC system event log.

Use the following commands in CLI mode:

- **identify**
Control the system-locator LED on the front of the server.
- **power**
Turn the server on and off remotely.
- **sel**
Perform operations with the BMC system event log.
- **sysinfo**
Display general system information that is related to the server and the baseboard management controller.

- **Serial over LAN**

Use the Serial over LAN capability to remotely perform control and management functions over a Serial over LAN (SOL) network. You can also use SOL to remotely view and change the server BIOS settings.

At a command prompt, type `telnet localhost 623` to access the SOL network. Type `help` at the `smbridge>` prompt for more information.

Use the following commands in an SOL session:

- **connect**
Connect to the LAN. Type `connect -ip ip_address -u username -p password`.
- **identify**
Control the system-locator LED on the front of the server.
- **power**
Turn the server on and off remotely.
- **reboot**
Force the server to restart.
- **sel get**
Display the BMC system event log.
- **sol**
Configure the SOL function.
- **sysinfo**
Display system information that is related to the server and the globally unique identifier (GUID).

Configuring the Gigabit Ethernet controllers

The Ethernet controllers are integrated on the system board. They provide an interface for connecting to a 10-Mbps, 100-Mbps, or 1-Gbps network and provide full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the network. If the Ethernet ports in the server support auto-negotiation, the controllers detect the data-transfer rate (10BASE-T, 100BASE-TX, or 1000BASE-T) and duplex mode (full-duplex or half-duplex) of the network and automatically operate at that rate and mode.

You do not have to set any jumpers or configure the controllers. However, you must install a device driver to enable the operating system to address the controllers. For device drivers and information about configuring the Ethernet controllers, see the

Broadcom NetXtreme II Gigabit Ethernet Software CD that comes with the server. To find updated information about configuring the controllers, complete the following steps.

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

1. Go to <http://www.ibm.com/servers/eserver/support/xseries/index.html>.
2. From the **Hardware** list, select **System x3655** and click **Go**.
3. Click the **Install and use** tab.
4. Click **Product documentation**.

Updating IBM Director

If you plan to use IBM Director to manage the server, you must check for the latest applicable IBM Director updates and interim fixes.

To install the IBM Director updates and any other applicable updates and interim fixes, complete the following steps.

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

1. Check for the latest version of IBM Director:
 - a. Go to http://www.ibm.com/servers/eserver/xseries/systems_management/xseries_sm/dwnl.html.
 - b. If the drop-down list shows a newer version of IBM Director than what comes with the server, follow the instructions on the Web page to download the latest version.
2. Install IBM Director.
3. Download and install any applicable updates or interim fixes for the server:
 - a. Go to <http://www.ibm.com/servers/eserver/support/xseries/index.html>.
 - b. From the **Hardware** list, select **System x3655** and click **Go**.
 - c. Click the **Download** tab.
 - d. Select any applicable update or interim fix that you want to download.
 - e. Click the link for the executable (.exe) file to download the file, and follow the instructions in the readme file to install the update or interim fix.
 - f. Repeat steps 3d and 3e for any additional updates or interim fixes that you want to install.

Setting up a Remote Supervisor Adapter II SlimLine

You use an optional Remote Supervisor Adapter II SlimLine to obtain enhanced system management capabilities, beyond those of the integrated BMC. The Remote Supervisor Adapter II SlimLine has a dedicated Ethernet connection at the rear of the server.

This section describes how to set up, cable, and configure the Remote Supervisor Adapter II SlimLine so that you can manage the server remotely.

In addition to the information in this section, see the *IBM Remote Supervisor Adapter II User's Guide* for information about how to configure and use the Remote Supervisor Adapter II SlimLine to manage the server remotely through the Web-based interface or the text-based interface.

Note: The Web-based interface and text-based interface do not support double-byte character set (DBCS) languages.

Requirements

Make sure that the following requirements are met:

- The Web interface Remote Disk function requires the client system to be running Microsoft Windows 2000 or later. The Web interface Remote Control features require the Java™ 1.4 Plug-in or later. The following Web browsers are supported:
 - Microsoft Internet Explorer version 5.5 or later with the latest Service Pack
 - Netscape Navigator version 7.0 or later
 - Mozilla version 1.3 or later
- If you plan to configure Simple Network Management Protocol (SNMP) trap alerts on the Remote Supervisor Adapter II SlimLine, install and compile the management information base (MIB) on your SNMP manager.
- You will need an Internet connection to the client system to download software and firmware from the IBM Support Web site during the installation process. The Remote Supervisor Adapter II SlimLine firmware and the SNMP MIB are available on the *ServerGuide Setup and Installation* CD; the latest versions are available at <http://www.ibm.com/servers/eserver/support/xseries/index.html>.

Cabling the Remote Supervisor Adapter II SlimLine

You can manage the server remotely through the Remote Supervisor Adapter II SlimLine by using the dedicated systems-management Ethernet connector on the rear of the server.

For additional information about network configuration, see the *Remote Supervisor Adapter II Installation Guide*.

To cable the Remote Supervisor Adapter II SlimLine, complete the following steps:

1. Connect one end of a Category 3 or Category 5 Ethernet cable to the dedicated systems-management Ethernet connector. See “Rear view” on page 12 for the location of the systems-management Ethernet connector.
2. Connect the other end of the cable to the network.

Installing the Remote Supervisor Adapter II SlimLine firmware

The software and firmware files that you need are contained in one system service package installation kit. The kit contains the following files:

- Software and firmware installation instructions
- BIOS code update with support for the Remote Supervisor Adapter II SlimLine
- Diagnostics code update
- Remote Supervisor Adapter II SlimLine device drivers
- Remote Supervisor Adapter II SlimLine firmware update
- Integrated service processor firmware update
- Video device driver
- Firmware-update utility program

To download and install the software and firmware, complete the following steps.

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

1. Go to <http://www.ibm.com/servers/eserver/support/xseries/index.html>.
2. From the **Hardware** list, select **System x3655** and click **Go**.
3. Click the **Download** tab.
4. Select the system service package for the operating system that is running on the server in which the Remote Supervisor Adapter II SlimLine is installed.
5. Click the file link to download the system service package to *d:\ibmssp*, where *d* is the hard disk drive letter. (Create the directory if necessary.)
6. Extract the files into *d:\ibmssp*. See the *readme.txt* file, which is included with the extracted files, for a list of the files in the package.
7. Follow the instructions in *Remote Supervisor Adapter II Installation Instructions*, which is in Portable Document Format (PDF) in *d:\ibmssp*, to install the software and firmware.
8. Restart the server after the software and firmware are installed.

Completing the setup

See the *IBM Remote Supervisor Adapter II User's Guide* on the IBM *System x Documentation* CD for instructions for completing the configuration, including the following procedures:

- Configuring the Ethernet ports
- Defining login IDs and passwords
- Selecting the events that will receive alert notifications
- Monitoring remote server status using the Remote Supervisor Adapter II SlimLine Web-based interface
- Controlling the server remotely
- Attaching a remote diskette drive, CD drive, or disk image to the server

After you configure the adapter, use the Web-based interface to create a backup copy of the configuration so that you can restore the configuration, if you have to replace the adapter. For more information, see the *Remote Supervisor Adapter II User's Guide*.

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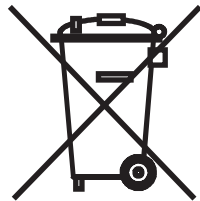
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Index

A

- ac power LED 12
- acoustical noise emissions 5
- Active Memory 6
- administrator password 67, 71
- attention notices 3

B

- baseboard management controller
 - about 6
 - utility programs 87
- battery
 - connector 17
- bypassing an unknown password 70

C

- cable
 - connectors 19, 20
 - routing 62
- cabling
 - external 62
 - system-board external connectors 20
 - system-board internal connectors 19
- caution statements 3
- CD-RW/DVD drive
 - installing 61
- CD/DVD drive activity LED 11
- CD/DVD-eject button 11
- Class A electronic emission notice 97
- command-line interface
 - commands
 - identify 88
 - power 88
 - sel 88
 - sysinfo 88
 - for remote management 87
- components, server 15
- configuration
 - Configuration/Setup Utility 66
 - viewing 76
- Configuration/Setup Utility program 66
- configuring
 - RAID controller 73
 - SAS devices 73
 - with ServerGuide 72
- connectors 12
 - adapter 17
 - battery 17
 - cable 19
 - external port 20
 - front 63
 - internal cable 19
 - memory 17
 - microprocessor 17
 - port 20

- connectors (*continued*)
 - rear 63
 - system board 17
 - VRM 17
- controller
 - Ethernet, configuring 88
- cooling 5
- cover
 - installing 62
 - removing 26

D

- danger statements 3
- device drivers 9
- DIMMs
 - installing 56
 - order of installation 55
- drive
 - CD-RW/DVD
 - installing 61
 - replacing 61
 - hot-swap
 - installing 38

E

- electrical input 5
- electronic emission Class A notice 97
- environment 5
- Ethernet activity LED 12
- Ethernet connector 12
- Ethernet-link status link LED 12
- external
 - cabling 62
 - connectors 62

F

- fan
 - installing 59
 - replacing 59
 - requirements 59
- FCC Class A notice 97
- features
 - and specifications 4
 - RAS 8
 - ServerGuide 72
- filler panel
 - hard-disk drive bay 39
 - requirements 62
- firmware code, updating 87
- forgotten password, bypassing 70

H

- hard disk drive
 - installing 38
- hard drive activity LED 11
- heat output 5
- hot-swap
 - drive
 - installing 38
 - power supply
 - installing 57
- humidity 5

I

- IBM Director 6, 9, 89
- IBM X-Architecture technology 6
- important notices 3
- information LED 11
- installing
 - CD-RW/DVD drive 61
 - cover 62
 - DIMMs 54
 - hard disk drive 38
 - hot-swap drive 38
 - memory modules 54
 - microprocessor 51
 - power supply 57
 - RAID controller 36

J

- jumper, clear CMOS (password override) 70
- jumpers 21

L

- LEDs 12
 - Ethernet activity 12
 - Ethernet-link status 12
 - front of server 10
 - rear of server 12
 - system board 23
- light path diagnostics
 - about 6
- location LED 11, 13

M

- management, system 6
- memory 6
- memory module
 - installing 56
 - order of installation 55
 - specifications 5
- microprocessor
 - heat sink 53
 - installing 51
 - specifications 5

N

- NOS installation
 - with ServerGuide 73
 - without ServerGuide 73
- notes 3
- notes, important 94
- notices
 - electronic emission 97
 - FCC, Class A 97
- notices and statements 3

O

- online publications 2
- operator information panel 10
- OSA SMBridge management utility program
 - enabling and configuring 77
 - installing 85

P

- password
 - administrator 71
 - clear CMOS jumper 70
 - override 70
 - power-on 70
- PCI
 - expansion slots 5
- port connectors 20
- power supply
 - installing 57
 - operating requirements 57
 - specifications 5
- power-cord connector 12
- power-on LED 11, 13
- power-on password 67
- publications 2

R

- RAID controller
 - installing 36
 - removing 36
 - replacing 36
- RAS features 8
- Remote Supervisor Adapter II SlimLine 7
 - cabling 90
 - installing firmware 90
 - setting up 89
- removing
 - CD-RW/DVD drive 61
 - RAID controller 36
- replacing
 - RAID controller 36
- riser-card assembly
 - installing 27
 - removing 27
 - replacing 26

S

- SAS connector
 - external 13
 - internal 19
- SDR/FRU, defined 65
- serial connector 13
- serial over LAN
 - commands
 - connect 88
 - identify 88
 - power 88
 - reboot 88
 - sel get 88
 - sol 88
 - sysinfo 88
- ServeRAID 7
- ServeRAID Manager 75
- ServerGuide
 - features 72
 - NOS installation 73
 - setup 72
- ServerGuide CD 6
- service processor, defined 13
- setting clear CMOS (password override) jumper 70
- size 5
- SMP 1
- specifications 4
- statements and notices 3
- status LEDs 12
- supervisor password
 - See administrator password
- switch
 - functions 21
 - location 21
- symmetric multiprocessing 1
- system board
 - connectors
 - external port 20
 - internal cable 19
 - internal SAS 19
 - user-installable options 17
 - jumpers 21
 - LEDs 23
 - switch block 21
- system-error LED 11, 13
- system-locator LED 11, 13
- systems management 6, 7, 9

T

- temperature 5
- thermal material, heat sink 54
- trademarks 93
- turning off the server 14
- turning on the server 13

U

- United States electronic emission Class A notice 97
- United States FCC Class A notice 97

- unknown password, bypassing 70
- UpdateXpress 9
- updating the firmware code 87
- USB connector 11, 12
- user password
 - See power-on password
- using
 - baseboard management controller utility
 - programs 87
- utility program
 - Adaptec RAID Configuration 73
 - baseboard management 85
 - Configuration/Setup 66
 - OSA SMBridge management 85

V

- video connector 11, 12

W

- weight 5



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