

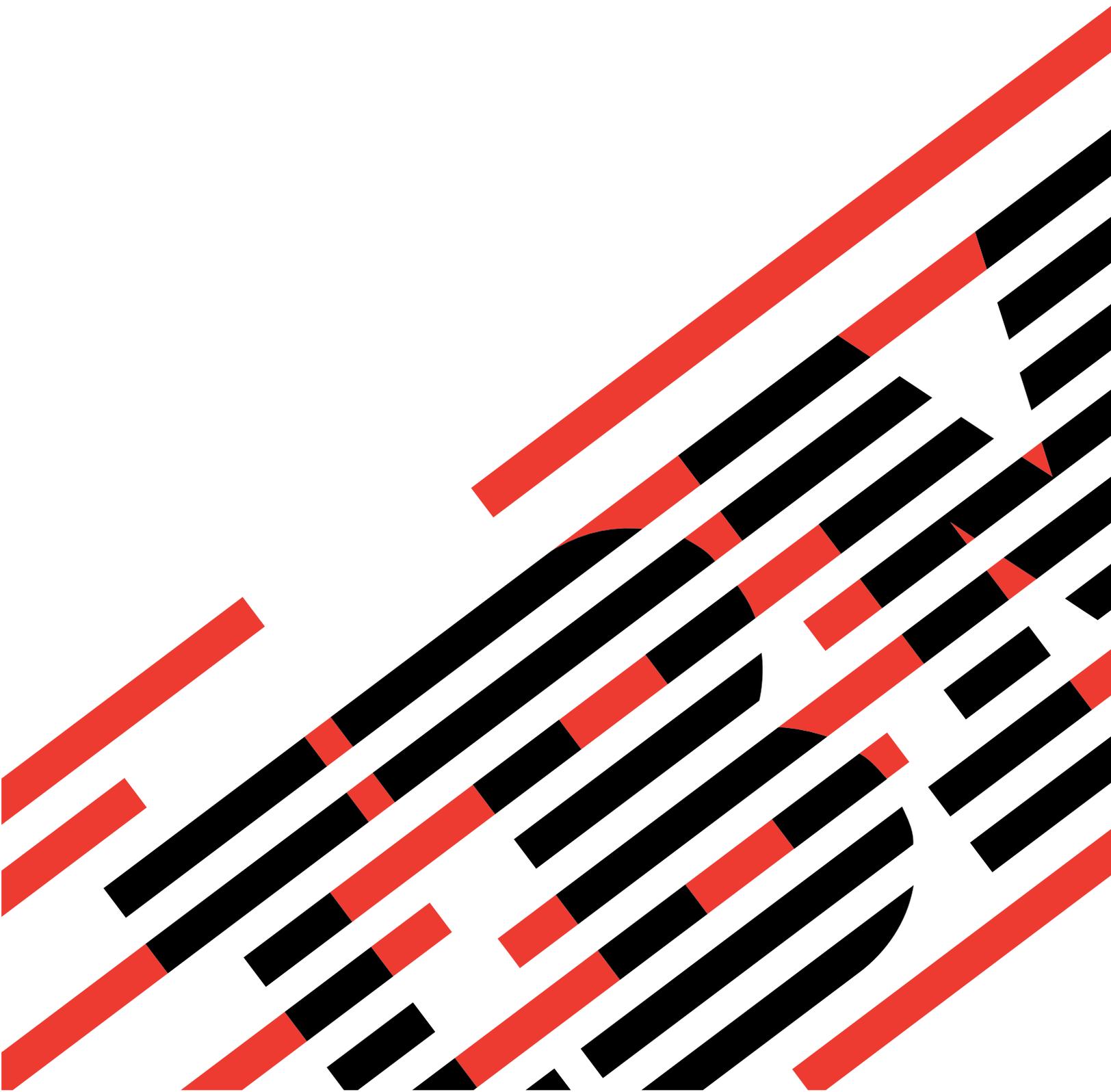
IBM

@server

xSeries 226

Type 8648

User's Guide





@server

xSeries 226

Type 8648

User's Guide

Note:

Before using this information and the product it supports, read the general information in and Appendix B, "Notices," on page 29.

First Edition (September 2004)

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

在安装本产品之前，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.

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.

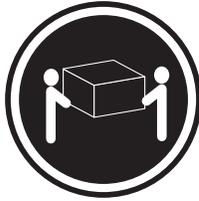


DANGER

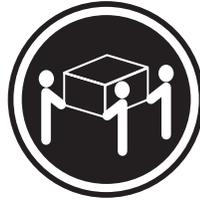
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

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

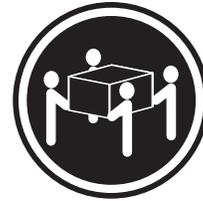
Statement 4:



≥ 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 12:



CAUTION:

The following label indicates a hot surface nearby.



Statement 13:



DANGER

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

Statement 15:



CAUTION:

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

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

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

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 your server or optional device before you install the device.

Chapter 1. Introducing the xSeries 226 Type 8648 server

The IBM® @server™ xSeries™ 226 Type 8648 server is a high-performance server based on IBM X-Architecture™ technologies. It is ideally suited for networking environments that require superior microprocessor performance, improved systems management as well as flexible memory and data management.

Performance, ease of use, reliability, and expansion capabilities were key considerations in the design of your 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.

Your server contains IBM Enterprise X-Architecture technologies, which help increase performance, reliability, and availability. For more information about the IBM X-Architecture technologies and features in your server, see “What your server offers” on page 4 and “Reliability, availability, and serviceability” on page 5. For additional information about the IBM X-Architecture technologies and features, go to <http://www.ibm.com/pc/us/eserver/xseries/xarchitecture/>.

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

For service or assistance information, see Appendix A, “Getting help and technical assistance,” on page 27.

Related documentation

This *User's Guide* provides general information about your server, including information about features, how to configure the server, and how to get help. In addition to this *User's Guide*, the following documentation comes with your server:

- *Installation Guide*
This printed document contains instructions for setting up your server and basic instructions for installing some options.
- *Option Installation Guide*
This document is in Portable Document Format (PDF) on the IBM *xSeries Documentation* CD. It contains instructions for installing, removing, and connecting optional devices that your server supports.
- *Safety Information*
This document is in PDF on the IBM *xSeries Documentation* CD. It contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* document.
- *Hardware Maintenance Manual and Troubleshooting Guide*
This document is in PDF on the IBM *xSeries Documentation* CD. It contains information to help you solve problems yourself, and it contains information for service technicians.

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

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

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

1. Go to <http://www.ibm.com/pc/support/>.
2. In the **Learn** section, click **Online publications**.
3. On the "Online publications" page, in the **Brand** field, select **Servers**.
4. In the **Family** field, select **xSeries 226**.
5. Click **Continue**.

Notices and statements used in this document

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

The following notices and statements are used in this document:

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

You can use the Configuration/Setup Utility program to determine the type and speed of the microprocessors in the server.

Table 1. Features and specifications

<p>Microprocessor:</p> <ul style="list-style-type: none"> • Supports up to two Intel Xeon microprocessors • 1 MB Level-2 cache • 800 MHz front-side bus (FSB) <p>Memory:</p> <ul style="list-style-type: none"> • Minimum: 512 MB • Maximum: 8 GB • Type: PC2-3200 double-data-rate 2 (DDR2) registered • Connectors: six dual inline memory module (DIMM) connectors <p>Drives standard:</p> <ul style="list-style-type: none"> • Diskette: 1.44 MB (two mode) • CD-ROM: IDE <p>Expansion bays:</p> <ul style="list-style-type: none"> • Four or six hard disk drive bays, depending on the model: <ul style="list-style-type: none"> – Six open hot-swap, slim-high, 3.5-inch SCSI drive bays (SCSI models) – Four slim-high, 3.5-inch Serial ATA (SATA) drive bays (SATA models) • Two half-high 5.25-inch bays (CD-ROM drive installed in one bay) • One slim-high 3.5-inch removable-media or hard disk drive bay (diskette drive installed) <p>PCI and PCI-X expansion slots:</p> <ul style="list-style-type: none"> • Two PCI 33 MHz/32-bit • Two PCI-X 100 MHz/64-bit • One PCI-X 133 MHz/64-bit • One PCI Express x16 <p>Video: ATI Radeon 7000-M video controller with 16 MB SDRAM video memory on the system board.</p> <p>Cooling: Three speed-controlled fans</p>	<p>Integrated functions:</p> <ul style="list-style-type: none"> • Support for IBM Remote Supervisor Adapter II • Broadcom 5721 10/100/1000 Ethernet controller with RJ-45 Ethernet port • Two serial ports • One parallel port • Integrated RAID capability: <ul style="list-style-type: none"> – SCSI models: SCSI controller with RAID capabilities and two Ultra320 SCSI ports (one internal, one optional external) – SATA models: Dual-port Serial ATA controller with RAID capabilities • Four Universal Serial Bus (USB) v2.0 ports (two on front and two on rear of enclosure) • Keyboard port • Mouse port • ATA-100 dual-channel IDE controller • ATI Radeon 7000-M video <ul style="list-style-type: none"> – Compatible with SVGA and VGA – 16 MB video memory <p>Diagnostic LEDs:</p> <ul style="list-style-type: none"> • Fans • Memory • Microprocessors • Hot-swap power supplies (some models) <p>Power supplies:</p> <ul style="list-style-type: none"> • Two (some models) 514-watt output (115-230 V ac) hot-swap power supplies. Two power supplies provide redundant power. • One (some models) 530-watt output (115-230 V ac) non-hot-swap power supply. <p>Size:</p> <ul style="list-style-type: none"> • Height: 440 mm (18.4 in.) • Depth: 643 mm (25.3 in.) • Width: 217 mm (8.5 in.) • Weight: 20 kg (44 lb) to 25.8 kg (57 lb) depending upon configuration 	<p>Electrical input:</p> <ul style="list-style-type: none"> • Sine-wave input (50 or 60 Hz) required • Input voltage and frequency ranges 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: 0.18 kVA (all models) – Maximum: <ul style="list-style-type: none"> - 0.86 kVA (non-redundant power supply models) - 0.72 kVA (redundant power supply models) <p>Heat output: Approximate heat output in British thermal units (Btu) per hour:</p> <ul style="list-style-type: none"> • Minimum configuration: 597 Btu/hour (175 watts) • Maximum configuration: <ul style="list-style-type: none"> – 2780 Btu/hour (815 watts) (non-redundant power supply models) – 2337 Btu/hour (685 watts) (redundant power supply models) <p>Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Server on: 10° to 35°C (50° to 95°F) – Altitude: 0 to 2134 m (7000 ft) – Server off: -40° to +60°C (-40° to 140°F) – Maximum altitude: 2133 m (7000 ft) • Humidity (operating and storage): 8% to 80% <p>Acoustical noise emissions:</p> <ul style="list-style-type: none"> • Non-redundant: <ul style="list-style-type: none"> Sound power, idle: 5.2 bel Sound power, operating: 5.3 bel • Redundant: <ul style="list-style-type: none"> Sound power, idle: 5.9 bel Sound power, operating: 6.0 bel
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Note: Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use.

What your server offers

Your server uses the following features and technologies:

- **High-performance graphics adapter**

Your server supports a high-performance graphics adapter in PCI slot 1 on the system board. This high-performance adapter supports high resolutions and includes many performance-enhancing features for your operating-system environment.

- **IBM Enhanced Diagnostics CD**

Your server comes with a *IBM Enhanced Diagnostics CD*, which you can use to diagnose problems.

- **IBM Director**

IBM Director is a workgroup-hardware-management tool that you can use to centrally manage 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 Intel-processor-based server powerful, scalable, and reliable. For more information, go to <http://www.ibm.com/pc/us/eserver/xseries/xarchitecture/>.

- **IBM ServerGuide Setup and Installation CD**

The *ServerGuide™ Setup and Installation CD* provides programs to help you set up your server and install a 32-bit Windows® operating system. The ServerGuide program detects installed hardware options 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 18.

- **Integrated network support**

Your server comes with an integrated Broadcom Gigabit Ethernet controller, which supports connection to a 10-Mbps, 100-Mbps, or 1000-Mbps network. For more information, see “Configuring the Gigabit Ethernet controller” on page 25.

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

Some server models support up to three 25.4-mm (1-inch) slim-high, 3.5-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.

- **Large system-memory capacity**

Your server supports up to 4 GB of system memory. The memory controller supports error correcting code (ECC) for up to four industry-standard, 2.5 V, 184-pin, double-data-rate (DDR), PC2700 or PC2-3200 unbuffered, synchronous dynamic random access memory (SDRAM) dual inline memory modules (DIMMs).

- **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 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.

- **ServeRAID support**

Your server supports ServeRAID adapters to create redundant array of independent disks (RAID) configurations. In addition, your server also has integrated RAID levels 0 and 1 support.

- **System data protection**

For increased security, the hot-swap drives and filler panels are locked in the server by a hot-swap lock bar. The hot-swap lock bar cannot be released to allow installation and removal of the hot-swap drives and filler panels unless the key lock on the server side cover is unlocked. .

- **Systems-management capabilities**

Your server supports an optional Remote Supervisor Adapter II. This adapter, when used with the systems-management software that comes with your server, enables you to manage the functions of the server locally and remotely. The Remote Supervisor Adapter II also provides system monitoring, event recording, and dial-out alert capability.

See the documentation that comes with your systems-management software for more information. To order an optional Remote Supervisor Adapter II, contact your IBM marketing representative or authorized reseller.

Reliability, availability, and serviceability

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

Your server has the following RAS features:

- 1-year parts, 1-year labor limited warranty
- Advanced Configuration and Power Interface (ACPI)
- Advanced Desktop Management Interface (DMI) features
- Alert Standard Format (ASF) 2.0 support providing secure remote power on/power off and seven standard alerts for components such as fans, voltage, and temperature
- Automatic BIOS recovery to a backup image
- Automatic error retry or recovery
- Automatic memory downsizing on error detection
- Automatic restart on nonmaskable interrupt (NMI)
- Automatic Server Restart (ASR) logic supporting a system restart when the operating system becomes unresponsive
- Automatic server restart after a power failure, based on the BIOS setting
- Availability of microcode level
- Boot-block recovery
- Built-in, menu-driven setup, system configuration, and redundant array of independent disks (RAID) configuration
- Built-in monitoring for fan, power, temperature, and voltage
- CD-based diagnostic programs
- Cooling fans with speed-sensing capability
- Customer support center that is available 24 hours a day, 7 days a week¹
- Diagnostic support of ServeRAID adapters
- Error codes and messages

1. Service availability will vary by country. Response time varies; may exclude holidays.

- Error correcting code (ECC) double-data-rate (DDR) synchronous dynamic random access memory (SDRAM) with serial presence detect (SPD)
- Error logging of POST failures
- Hot-swap SCSI hard disk drives
- Integrated Ethernet controller
- Support for the optional IBM Remote Supervisor Adapter II
- Key-lock support for physical security
- Memory change messages posted to the error log
- Power-on self-test (POST)
- Predictive Failure Analysis[®] (PFA) alerts
- Read-only memory (ROM) checksums
- Redundant Ethernet capabilities (requires an optional Ethernet adapter) with failover support
- Simple-swap Serial ATA hard disk drives
- Standby voltage for system-management features and monitoring
- System auto-configuring from the configuration menu
- System-error LED on the front bezel and diagnostics LEDs on the system board
- Upgradeable microcode for POST, BIOS, and read-only memory (ROM) resident code, locally or over a LAN
- Vital product data (VPD); includes serial-number information and replacement part numbers, stored in nonvolatile memory, for easier remote maintenance
- Wake on LAN[®] capability

IBM Director

With IBM Director, a network administrator can:

- 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 Intel-based servers, desktop computers, workstations, and mobile computers on a variety of platforms

IBM Director provides a comprehensive entry-level workgroup hardware manager. Key features include:

- Advanced self-management capabilities for maximum system availability.
- Multiple operating-system platform support, including Microsoft® Windows 2000 Server, Windows 2003 Server, Windows XP Professional, Red Hat Linux®, SUSE LINUX, 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/ww/eserver/xseries/systems_management/nfdir/agent.html. 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:

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

For more information about IBM Director, see the *IBM Director* CD that comes with your server, the IBM Director documentation on the CD, and the IBM xSeries Systems Management Web page at http://www.ibm.com/servers/eserver/xseries/systems_management/xseries_sm.html, which presents an overview of IBM Systems Management and IBM Director.

Update Xpress program

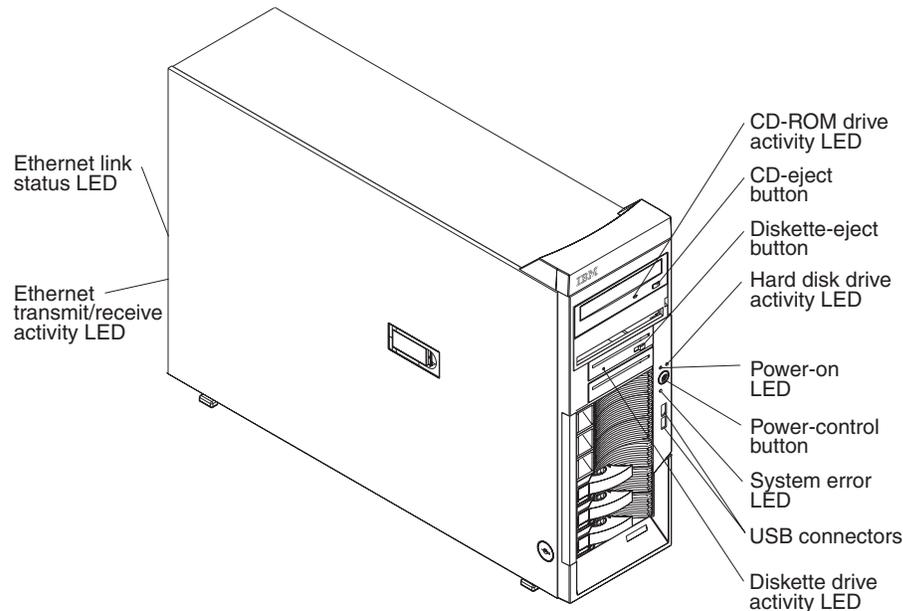
The UpdateXpress program is available for most xSeries servers and server options. It detects supported and installed device drivers and firmware in your server and installs available updates. You can download the UpdateXpress program from the Web at no additional cost, or you can purchase it on a CD.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

Server controls, connectors, LEDs, and power

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

Front view

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



CD-eject button

Press this button to release a CD from the CD-ROM drive.

CD-ROM drive activity LED

When this LED is lit, it indicates that the CD-ROM drive is in use.

Diskette-eject button

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

Diskette drive activity LED

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

Hard disk drive activity LED

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

Hot-swap hard disk drive activity LED (some models)

On SCSI hot-swap server models, each hot-swap drive has a hard disk drive activity LED. When this green LED is flashing, it indicates that the drive is in use.

Hot-swap hard disk drive status LED (some models)

On SCSI hot-swap server models, each hot-swap hard disk drive has an amber status LED. If the status LED for a drive is lit continuously, it indicates that the individual drive is faulty. The interpretation of a flashing status LED depends on the SCSI controller that is connected to the hot-swap drive, as follows:

When the drive is connected to an optional ServerRAID adapter, a slowly flashing (one flash per second) status LED indicates that the drive is being

| rebuilt. When the LED is flashing rapidly (three flashes per second), it
| indicates that the controller on the adapter is identifying the drive.

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 off and still connected to an ac power source.

Power-control button

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

System-error LED

| When this amber LED is lit, it indicates that a system error has occurred.

| An LED on the system board might also be lit to help isolate the error.

| Detailed troubleshooting information is in the *Hardware Maintenance*

| *Manual and Troubleshooting Guide* on the IBM xSeries Documentation CD.

USB connectors

| Connect USB devices to these connectors.

Ethernet link status LED

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

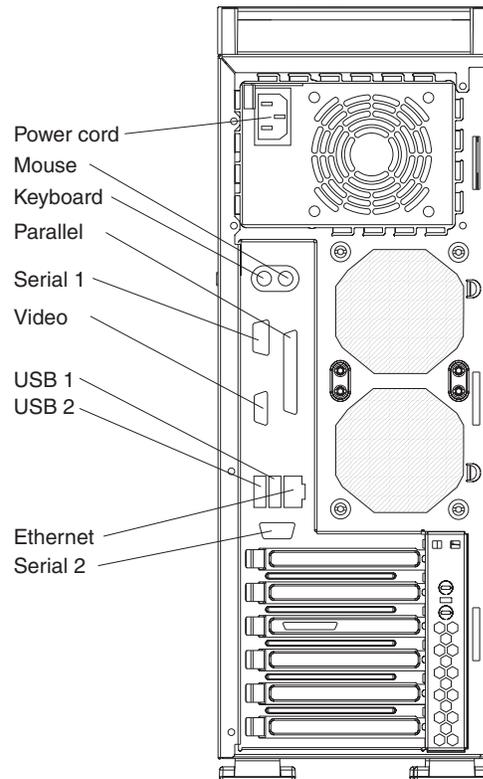
Ethernet transmit/receive activity LED

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

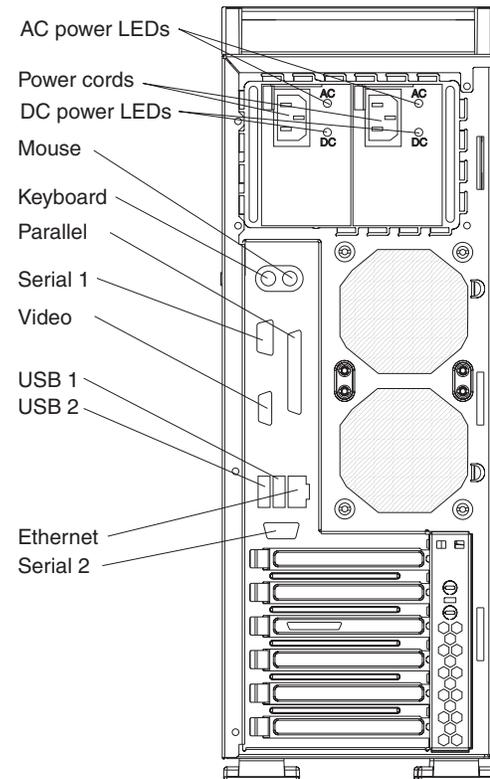
Rear view

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

Non-redundant power supply



Redundant power supplies



Power-cord connector

Connect the power cord to this connector.

AC LED

On the SCSI hot-swap server models that have redundant power supplies, when this light is lit the power supply has AC voltage applied.

DC LED

On the SCSI hot-swap server models that have redundant power supplies, when this light is lit the power supply is turned on and operating.

Mouse connector

Connect a mouse or other PS/2® device to this connector.

Keyboard connector

Connect a PS/2 keyboard to this connector.

Parallel connector

Connect a parallel device to this connector.

Video connector

Connect a monitor to this connector.

Serial 1 connector

Connect a 9-pin serial device to this connector.

USB 2 connector

Connect a USB device to this connector.

USB 1 connector

Connect a USB device to this connector.

Ethernet connector

Use this connector to connect the server to a network.

Serial 2 connector

Connect a 9-pin serial device to this connector.

If you have an optional Remote Supervisor Adapter II (systems-management adapter) installed in PCI-X slot 2, your server has additional connectors and LEDs. See the *Option Installation Guide* for more information about these connectors and LEDs. In addition, if you install the optional Remote Supervisor Adapter II, you must disconnect the video cable from the server external video connector and connect it to the optional Remote Supervisor Adapter II.

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 is shut down; however, the server can respond to remote requests to turn on the server. The power-on LED flashes to indicate that the server is connected to an ac power source but is not turned on.

Note: When the server is connected to an ac power source, the power supply fan turns on and remains on to provide cooling to the power supply.

Turning on the server

Approximately 20 seconds after the server is connected to ac power, the power-control button becomes active, and 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 systems-management software for an optional Remote Supervisor Adapter II, the systems-management software can turn on the server.
- If your operating system supports the Wake on LAN feature, the Wake on LAN feature can turn on the server.
- If an optional Remote Supervisor Adapter II is installed in the server, the server can be turned on from the Remote Supervisor Adapter II user interface.

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 options.

Turning off the server

When you turn off the server and leave it connected to ac power, the server can respond to remote requests to turn on the server. To remove all power from the server, you must disconnect it from the power source.

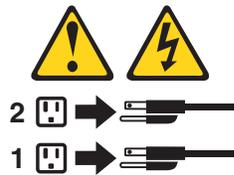
Some operating systems require an orderly shutdown before you turn off the server. See your operating-system documentation for information about shutting down the operating system.

Statement 5:



CAUTION:

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



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

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

Chapter 2. Configuring the server

The following configuration programs and capabilities come with your server:

- **Configuration/Setup Utility program**

The Configuration/Setup Utility program is part of the basic input/output system (BIOS) code in your server. 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 14.

- **IBM ServerGuide Setup and Installation CD**

The ServerGuide program provides software-setup tools and installation tools that are designed for your server. Use this CD during the installation of your server to configure basic hardware features, such as a SCSI controller with RAID capabilities, 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 18.

- **Boot Menu program**

The Boot Menu program is part of the BIOS code in your server. 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.

- **Ethernet controller configuration**

For information about configuring the Ethernet controller, see “Configuring the Gigabit Ethernet controller” on page 25.

- **Adaptec® HostRAID™ configuration programs**

- **Adaptec RAID Configuration Utility programs (for Serial ATA RAID)**

Use the Array Configuration Utility within the Adaptec RAID Configuration Utility programs to configure RAID for the integrated Serial ATA (SATA) controller and the devices that are attached to it. For more information about using these utility programs, see “Using the Adaptec RAID Configuration Utility programs (for Serial ATA RAID)” on page 21.

- **SCSISelect Utility program (for SCSI RAID)**

Use the SCSI HostRAID feature of SCSISelect Utility program to configure RAID for the SCSI controller and the devices that are attached to it. For more information about using this utility program, see “Using the SCSISelect Utility program (for SCSI RAID)” on page 22.

- **ServeRAID Manager**

ServeRAID™ Manager is available as a stand-alone program and as an IBM Director extension. If a ServeRAID adapter is installed in your server, use ServeRAID Manager to define and configure your disk-array subsystem *before* you install your operating system. For information about using this program, see “Using ServeRAID Manager” on page 23.

- **SCSISelect Utility program (some models)**

For general configuration, use the SCSISelect Utility program to configure devices that are attached to the SCSI controller. For information about using this utility program, see “Using the SCSISelect Utility program (some models)” on page 25.

Using the Configuration/Setup Utility program

Use the Configuration/Setup Utility program to:

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

Starting the Configuration/Setup Utility program

Complete the following steps to start the Configuration/Setup Utility program.

Note: When you use your server for the first time, you might want to use the Configuration/Setup Utility program main menu choice **Load Default Settings** to reset the Configuration/Setup Utility menu choices to the factory default settings. Otherwise, some items might not appear in the list of menu choices.

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 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 in your server, some menu choices might differ slightly from these descriptions.

- **System Summary**

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

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

- **System Information**

Select this choice to view information about your server, such as the machine type and model of the computer, the serial number, the system board identifier, and the revision level and issue date of the BIOS code stored in the electrically

erasable programmable ROM (EEPROM). 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.

- **Devices and I/O Ports**

Select this choice to view or change assignments for devices and input/output (I/O) ports, and to specify whether parallel ATA, Serial ATA, or both, will be the native mode for the server.

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

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

- **Date and Time**

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

- **System Security**

Select this choice to set passwords. See “Passwords” on page 17 for more information about passwords. You can also enable the chassis-intrusion detector to alert you each time the server cover is removed.

- **Administrator Password**

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. See “Administrator password” on page 17 for more information.

- **Power-on Password**

Select this choice to set or change a power-on password. See “User password” on page 17 for more information.

- **Startup Option**

Select this choice to view or change the start options. Changes in the start options take effect when you restart 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. You can enable or disable USB support. If you disable the integrated USB controller, the server will have no USB capability; to maintain USB capability, make sure that **Enabled** is selected for the **USB Legacy Support** and **USB devices** options.

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. You can also specify whether the integrated SCSI controller or an optional SCSI adapter has boot precedence.

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

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

- **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.

The following choices are available:

- **Memory Cache**

Select this choice to specify what types of memory to cache and how the cache should function (Write Protect, Write Back, Write Through, or Disabled).

- **CPU Options**

Select this choice to enable or disable Hyper-Threading Technology. The default setting for Hyper-Threading Technology is **Enabled**.

Attention: Do not make changes in the **Advanced Processor Control** option unless directed to do so by an IBM authorized service representative.

- **Advanced Chipset control**

Select this choice to modify settings that control features of the core chip set on the system board, such as the PCI master latency timer or the PCI interrupts.

Attention: Do not make changes in the **Advanced Chipset Feature** option unless directed to do so by an IBM authorized service representative.

- **PCI Bus Control**

Select this choice to set the PCI master latency timer value and PCI interrupt routing.

- **Power Management Setup**

Select this choice to enable or disable system power settings. This includes automatic power-on settings such as the Wake on LAN feature.

- **Hardware Monitor**

Select this choice to display the server temperature and voltage status, and fan speeds.

- **ASF Configuration**

Select this choice to set the event-specific intervals of time at which the system automatically resets if events such as operating-system startup or BIOS startup do not complete.

- **Error Logs**

Select this choice to view the three most recent error codes and messages that the system generated during POST, to view the Desktop Management Interface (DMI) event log, and to clear the error logs.

- **Save Settings**

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

- **Restore Settings**

Select this choice to cancel the changes 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 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 (user) password and an administrator (supervisor) 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 and to 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.

User password

If a user password is set, when you turn on the server, the system startup will not be completed until you type the user password. You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for the password.

When a user 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 user 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.

Resetting passwords

If you forget the user 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. Start the Configuration/Setup Utility program and reset the user password.
- Remove the server battery and then reinstall it. See the *Option Installation Guide* for instructions for removing the battery.
- Change the pin position of the clear CMOS (password override) jumper on the system board to bypass the user password check. See the *Installation Guide* for the location of the clear CMOS jumper.

If you forget the administrator password, you can change the pin position of the clear CMOS jumper on the system board to bypass the user and administrator password check. This enables you to reset these passwords. See the *Installation Guide* for the location of the clear CMOS jumper.

Using the ServerGuide Setup and Installation CD

The *ServerGuide Setup and Installation CD* includes an easy-to-use setup and installation program that is designed for your IBM server. The ServerGuide program detects the server model and hardware options 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.

Note: The ServerGuide program works only with 32-bit Windows operating systems.

If the ServerGuide program did not come with your server, or 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/pc/coupon/>.

The ServerGuide program has the following features to make setup easier:

- An easy-to-use interface
- Diskette-free setup, and configuration programs that are based on detected hardware
- ServeRAID Manager program, which configures the ServeRAID adapter and updates the ServeRAID firmware if needed
- 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-ROM drive. In addition to the *ServerGuide Setup and Installation CD*, you must have your operating system CD to install your operating system.

The ServerGuide program has the following features:

- Sets system date and time
- Detects the SCSI RAID adapter, controller, or integrated SCSI controller with RAID capabilities and runs the SCSI 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 hardware options 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 integrated SCSI controller with RAID capabilities, you can run the SCSI 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

You can use the ServerGuide program to shorten your installation time. The ServerGuide program 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 decide not to use the ServerGuide program to install your operating system, complete the following steps to download the latest operating-system installation instructions from the IBM Support Web page:

1. Go to <http://www.ibm.com/pc/support/>.
2. In the **Download** section, click **Downloads & drivers**.

3. On the “Downloads and drivers” page, in the **Brand** field, select, **Servers**.
4. In the **Family** field, select **xSeries 226**.
5. Click **Continue**.
6. In the **View by document type** field, select **OS installation**.
7. Select the instructions for your operating system.

Using the Boot Menu program

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

Complete the following steps to use the Boot Menu program:

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

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

Using the Adaptec HostRAID configuration programs

Use the Adaptec RAID Configuration Utility programs and SCSISelect Utility (also referred to as IBM ServeRAID-7e) to add RAID level-0 and level-1 functionality to the integrated Serial ATA controller and the SCSI controller. Be sure to use these programs as described in this document. Use these programs to:

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

Consider the following information when using the Adaptec RAID Configuration Utility programs and SCSISelect Utility program to configure and manage arrays:

- The SCSI controller with integrated SCSI RAID (in SCSI models) and the integrated Serial ATA controller with integrated SATA RAID (in SATA models) supports RAID level-0 and level-1 with the option of having a hot-spare drive. Installing an optional ServeRAID controller provides additional RAID levels.
- 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 adapter, you must use the IBM *ServeRAID Support* CD that comes with the ServeRAID option.
- If you install a different type of RAID adapter in the server, use the configuration method described in the instructions that come with that adapter to view or change SCSI settings for attached devices.

Using the Adaptec RAID Configuration Utility programs (for Serial ATA RAID)

Use the Array Configuration Utility, in the Adaptec RAID Configuration Utility programs, to add RAID level-0 and level-1 functionality to the integrated Serial ATA (SATA) controller. This utility is part of the BIOS code in the server. For additional information about using the Adaptec RAID Configuration Utility programs, see the documentation on the IBM *ServeRAID-7e (Adaptec HostRAID) Support CD*. If this CD did not come with your server, you can download it from the IBM Web site at <http://www.ibm.com/pc/support/>.

The integrated Serial ATA RAID feature (SATA HostRAID) comes disabled by default. You must enable it and install the device drivers before you can use it. The SATA RAID feature configuration utilities, device drivers, and information are available on the IBM *ServeRAID-7e (Adaptec HostRAID) Support CD*.

Enabling the Serial ATA HostRAID feature

Complete the following steps to enable the SATA RAID feature:

1. Turn on the server.
2. When the prompt Press F1 for Configuration/Setup appears, press F1. If you have set an administrator password, you are prompted to type the password.
3. Select **Advanced Setup**.
4. Make sure the setting for **Serial ATA** is **Enabled**.
5. Scroll down and select **SATA RAID Enable**.
6. Select **Enabled**.
7. Press Esc; then, select **Yes** to save the changes.

Using the Serial ATA HostRAID feature

The instructions in this section are for using the Array Configuration Utility program to access and perform an initial RAID level-1 configuration on the integrated SATA controller. If you install a RAID adapter in the server, use the configuration method described in the instructions that come with that adapter to view or change settings for the attached devices.

Note: The integrated SATA controller supports only two hard disk drives. For the server (SATA models) to support up to four SATA hard disk drives, an optional SATA RAID adapter must be installed in the server. See the *Option Installation Guide* for more information.

See the documentation on the IBM *ServeRAID-7e (Adaptec HostRAID) Support CD* for additional information about using the Array Configuration Utility program to create, configure, and manage arrays.

Configuring the controller: Complete the following steps to use the Array Configuration Utility program to configure a RAID level-1 array on your server.

1. Turn on the server and watch the monitor screen.
2. When the message Press <CTRL><A> for Adaptec RAID Configuration Utility appears, press Ctrl+A.
3. Select **Array Configuration Utility (ACU)**.
4. Select **Create Array**.
5. From the list of ready drives, select the two drives that you want to group into the array.
6. When asked to select the RAID level, select **RAID-1**.

7. (Optional) Type an identifier for the array.
8. When asked for the array build method, select **Quick Int**.
9. Follow the instructions on the screen to complete the configuration, and select **Done** to exit.
10. Restart the server.

Viewing the configuration: Complete the following steps to view information about the Serial ATA controller:

1. Start the Array Configuration Utility.
2. From the Array Configuration Utility screen, select **Manage Arrays**.
3. Select an array and press Enter.
4. Press Esc to exit the program.

Using the SCSISelect Utility program (for SCSI RAID)

Use the SCSISelect Utility program to add RAID level-0 and level-1 functionality to the SCSI controller. This utility is part of the BIOS code in your server.

The integrated SCSI RAID feature (SCSI HostRAID) comes disabled by default. You must enable it and install the device drivers before you can use it. The SCSI RAID configuration utilities, device drivers, and information are available on the IBM *ServeRAID-7e (Adaptec HostRAID) Support CD*. If this CD did not come with your server, you can download it from <http://www.ibm.com/pc/support/>.

Enabling the SCSI HostRAID feature

Complete the following steps to enable the SCSI RAID feature:

1. Turn on the server.
2. When the prompt Press <CTRL><A> for SCSISelect Utility appears, press Ctrl+A. If you have set an administrator password, you are prompted to type the password.
3. Use the arrow keys to select the channel for which you want to change settings and press Enter.
4. Select **Configure/View SCSI Controller Setting**; then, select **HostRAID**.
5. Select **Enabled**.
6. Press Esc; then, select **Yes** to save the changes.

Using the SCSI HostRAID feature

The instructions in this section describe how to access the SCSI RAID feature from the SCSISelect Utility program and perform an initial RAID level-1 configuration. If you install a different type of RAID adapter in the server, use the configuration method described in the instructions that come with that adapter to view or change SCSI settings for attached devices.

See the documentation on the IBM *ServeRAID-7e (Adaptec HostRAID) Support CD* for additional information about how to use the SCSI HostRAID feature.

Configuring the controller: Complete the following steps to use the SCSI HostRAID feature to configure a RAID level-1 array:

1. From the SCSISelect main menu, select **Configure/View HostRAID Settings**.
2. From the list of ready drives, type C to create an array.
3. When asked to select the RAID type, select **RAID-1**.
4. From the list of ready drives, select the two drives that you want to group into the array.

5. Select **Create new RAID-1**.
6. Type an identifier for the array.
7. Select **Yes** to create the array.
8. Press Esc to exit the utility.
9. Restart the server.

Viewing the configuration: You can use the SCSISelect Utility program to view information about the SCSI controller. From the list of available arrays, select an array and press Enter. Press Esc to exit the utility.

Using ServeRAID Manager

Use ServeRAID Manager, which is on the IBM ServeRAID Support CD, to:

- Configure a redundant array of independent disks (RAID) array
- Restore a SCSI hard disk drive to the factory-default settings, erasing all data from the disk
- View the RAID configuration and associated devices
- Monitor operation of the RAID controllers

To perform some tasks, you can run ServeRAID Manager as an installed program. However, to configure the integrated SCSI controller with RAID capabilities and perform an initial RAID configuration on your server, you must run ServeRAID Manager in Startable CD mode, as described in the instructions in this section. If you install a different type of RAID adapter in your server, use the configuration method described in the instructions that come with that adapter to view or change SCSI settings for attached devices.

See the ServeRAID documentation on the *IBM ServeRAID Support* CD or additional information about RAID technology and instructions for using ServeRAID Manager. 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 controller

By running ServeRAID Manager in Startable CD mode, you can configure the 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 the ServeRAID Manager program in startable-CD mode, turn on the server; then, insert the CD into the CD-ROM drive. If the ServeRAID Manager program 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 that you want to configure.
2. From the toolbar, click **Create**.

3. Click **Express configuration**.
4. Click **Next**. The “Configuration summary” window opens.
5. Review the information that is displayed in the “Configuration summary” window. To change the configuration, click **Modify arrays** or **Modify logical drives**.

Note: Some operating systems have size limitations for logical drives. Before you save the configuration, verify that the size of the logical drive is appropriate for your operating system.

6. 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.
7. Exit from the ServeRAID Manager program and remove the CD from the CD-ROM drive.
8. Restart the server.

Using custom configuration

Complete the following steps to use custom configuration:

1. In the ServeRAID Manager tree, click the controller that you want to configure.
2. From the toolbar, click **Create**.
3. Click **Custom configuration**.
4. Click **Next**. The “Create arrays” window opens.
5. Click the appropriate tab in the right pane; then, from the list of ready drives, select the two drives you want to move to the array.
6. Click the icon to add the drives to the array.
7. Complete the following steps if you want to configure a hot-spare drive:
 - a. Click the **Spares** tab.
 - b. Select the physical drive you want to designate as the hot-spare drive; then, click the icon to add the drive.
8. Click **Next**. The “Configuration summary” window opens.
9. Review the information that is displayed in the “Configuration summary” window. To change the configuration, click **Back**.
10. 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.
11. Exit from the ServeRAID Manager program, and remove the CD from the CD-ROM drive.
12. 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**.

To display available actions for an item, click the item in the ServeRAID Manager tree and click **Actions**.

Configuring the Gigabit Ethernet controller

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

You do not have to set any jumpers or configure the controller. However, you must install a device driver to enable the operating system to address the controller. For device drivers and information about configuring the Ethernet controller, see the *Broadcom NetXtreme Gigabit Ethernet Software CD* that comes with your server. For updated information about configuring the controller, go to <http://www.ibm.com/pc/support/>.

Using the SCSISelect Utility program (some models)

Use the SCSISelect Utility program to configure SCSI devices.

Starting the SCSISelect Utility program

Complete the following steps to start the SCSISelect utility program:

1. Turn on the server.
2. When the prompt <<< Press <CTRL><A> for SCSISelect Utility! >>> appears, press Ctrl+A. If you have set an administrator password, you are prompted to type the password.
3. Use the arrow keys to select a choice for which you want to change settings, and press Enter.
4. When the prompt Would you like to configure the SCSI controller or run the SCSI disk utility? appears, make your selection and press Enter.
5. Use the arrow keys to select a choice from the menu.
6. Follow the instructions on the screen to change the settings of the selected items, and press Enter.

SCSISelect Utility menu choices

The following choices are on the SCSISelect Utility menu:

- **Configure/View SCSI Controller Settings**

Select this choice to view or change SCSI controller settings. To reset the SCSI controller to its default values, press F6 and follow the instructions on the screen.

You can view or change the following controller settings:

- **SCSI Controller ID**

Select this choice to view the SCSI controller ID, which is typically 7.

- **SCSI Controller Termination**

This choice is set to **Enabled** and cannot be changed.

- **Boot Device Configuration**

Select this choice to configure startable-device parameters. You must know the SCSI ID of the device that you want to configure.

- **SCSI Device Configuration**

Select this choice to configure SCSI-device parameters. You must know the SCSI ID of the device that you want to configure.

The sync transfer rate is the transfer rate for Ultra SCSI devices. For Ultra3 SCSI LVD devices, the maximum rate is 160 MBps; for Ultra2 SCSI devices, 80 MBps; for Fast SCSI devices, 20 MBps.

– **Advanced Configuration**

Select this choice to view or change the settings for advanced configuration options.

• **SCSI Disk Utilities**

Select this choice to view the SCSI IDs assignments or to format a SCSI device. Select a device from the list and read the instructions on the screen carefully before making a selection.

If you press Ctrl+A before a selected drive is ready, an Unexpected SCSI Command Failure screen might appear. Restart the server and watch the SCSISelect messages as each drive spins up. When the selected drive is ready, press Ctrl+A.

For information about how to use this utility to perform an initial RAID level-1 configuration on your server, see “Using the SCSISelect Utility program (for SCSI RAID)” on page 22.

Appendix A. Getting help and technical assistance

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

Before you call

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

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

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

Using the documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/pc/support/> and follow the instructions. Also, you can order publications through the IBM Publications Ordering System at <http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is <http://www.ibm.com/eserver/xseries/>. The address for IBM IntelliStation information is <http://www.ibm.com/pc/intellistation/>.

You can find service information for your IBM products, including supported options, at <http://www.ibm.com/pc/support/>.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to <http://www.ibm.com/services/sl/products/>.

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

Hardware service and support

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

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

Appendix B. Notices

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Important notes

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

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

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

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

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

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Product recycling and disposal

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

Battery return program

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

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In the Netherlands, the following applies.



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

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

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

Avis de conformité à la réglementation d'Industrie Canada

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

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

United Kingdom telecommunications safety requirement

Notice to Customers

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

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

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

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

Taiwanese Class A warning statement

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

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

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

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

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

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

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