# IBM

## @server

xSeries 365
Type 8861 and 8862

User's Guide

# IBM

**@server**

xSeries 365
Type 8861 and 8862

# User's Guide

**Note:**

Before using this information and the product it supports, read the general information in Appendix B, "IBM Statement of Limited Warranty Z125-4753-07 11/2002," on page 35 and Appendix C, "Notices," on page 53.

# Contents

# Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по
технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

**Important:**

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

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

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

**Statement 1:**

**DANGER**

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

**To avoid a shock hazard:**

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

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

**Statement 2:**



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

*Do not:*
- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

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

**Statement 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:**
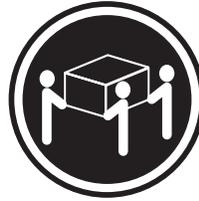
≥ 18 kg (39.7 lb)        ≥ 32 kg (70.5 lb)        ≥ 55 kg (121.2 lb)
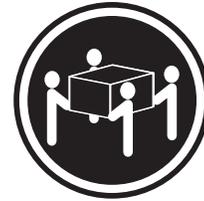
**CAUTION:**
**Use safe practices when lifting.**

**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.**

2

1
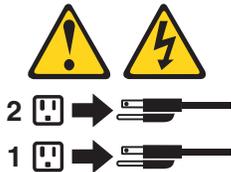
**Statement 8:**



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



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

**Statement 10:**



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



>82 kg (180 lb)

# Chapter 1. Introducing the xSeries 365 server

The IBM® @server xSeries® 365 server is a 3-U-high[1] rack model server for high-volume network transaction processing. This high-performance, symmetric multiprocessing (SMP) server is ideally suited for networking environments that require superior microprocessor performance, input/output (I/O) flexibility, and high manageability.

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 comes with a limited warranty. For more information about the terms of your warranty, see Appendix B, "IBM Statement of Limited Warranty Z125-4753-07 11/2002," on page 35.

Your server contains IBM Enterprise X-Architecture™ technologies, which help increase performance and reliability. For more information, see "What your server offers" on page 4 and "Reliability, availability, and serviceability" on page 5.

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 33.

## Related documents

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 detailed 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.
*   *Rack Installation Instructions*

    This printed document contains instructions for installing your server in a rack.
*   *Hardware Maintenance Manual and Troubleshooting Guide*

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1.  Racks are marked in vertical increments of 1.75 inches each. Each increment is referred to as a unit, or a "U". A 1-U-high device is 1.75 inches tall.

**1**

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 documents might be included on the IBM *xSeries Documentation* CD.

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

1. Go to http://www.ibm.com/pc/support/.
2. In the **Learn** section, click **Online publications**.
3. On the ″Online publications″ page, in the **Brand** field, select **Servers**.
4. In the **Family** field, select **xSeries 365**.
5. Click **Display documents**.

## Notices and statements used in this document

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

The following notices and statements are used in this document:

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

# Features and specifications

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

**Microprocessor:**
- Intel Xeon™Processor MP (frequency varies with server model, each MP processor functions as two logical processors)
  - Minimum: One
  - Maximum: Four
- Level-3 cache size varies with model
- 400 MHz front-side bus (FSB)

**Memory:**
- Type: error correcting code (ECC), double-data rate (DDR) SDRAM, PC2100 registered DIMMs with Chipkill™
- Supports 512 MB, 1 GB, and 2 GB DIMMs
- Capacity and features depend on server model:
  - Memory cassette with 8-DIMM-connector memory board
    - Minimum: 1 GB
    - Maximum: 16 GB
    - Interleaved
  - Memory cassette with 16-DIMM-connector memory board
    - Minimum: 1 GB
    - Maximum: 32 GB
    - Interleaved
    - Memory mirroring
    - Memory ProteXion™
    - Redundant bit steering

**Drives standard:**
- Slim diskette: 1.44 MB
- Slim CD-ROM: IDE (upgradable to DVD-ROM)

**Hard disk drives:**
- Slim-high Ultra320 hot-swap SCSI drives
- Maximum: Six

**Active™ PCI-X expansion slots:**
- One 33 MHz/64-bit PCI
- One 100 MHz/64-bit PCI-X
- Four 133 MHZ/64-bit PCI-X

**Hot-swap cooling:**

Six hot-swap fans

**Hot-swap power supplies:**

950 W (100-240 V ac)
- Minimum: One or two, depending on the server model
- Maximum: Two, for redundant power

**Video:**
- ATI RageXL video controller on I/O board, disabled when Remote Supervisor Adapter II is installed
- Compatible with SVGA 4
- 8 MB SDRAM video memory

**Size (3 U)**
- Height: 129 mm (5.07 in.)
- Depth: 715 mm (28.14 in.)
- Width: 444 mm (17.46 in.)
- Weight: 29 kg (63 lb) to 38 kg (83 lb) depending upon configuration

**Integrated functions:**
- IBM XA-32™ Chipset with integrated memory, I/O controller, and remote I/O controller.
- Service processor with support for Remote Supervisor Adapter II
- Light Path Diagnostics
- LSI Ultra320 SCSI controller with RAID level-1 capability
- Two Broadcom 1GB Ethernet controllers with Wake on LAN® and Alert Standard Format support
- Three universal serial bus (USB) ports
- RXE Expansion Port
- RXE Management Port
- Serial port
- Keyboard port
- Mouse port
- SCSI port

**Remote Supervisor Adapter II:**
- ATI Radeon RV-100 video controller
- ASM port
- Ethernet port
- Serial port
- Video port

**Acoustical noise emissions:**
- Sound power, idling: 6.6 bel maximum
- Sound power, operating: 6.6 bel maximum
- Sound pressure, operating: 50 dBa maximum

**Environment:**
- Air temperature:
  - Server on: 10° to 35°C (50° to 95°F). Altitude: 0 to 914 m (3000 ft)
  - Server on: 10° to 32°C (50° to 89.6°F). Altitude: 914 m (3000 ft) to 2133 m (7000 ft)
  - Server off: 10° to 43°C (50° to 110°F). Maximum altitude: 2133 m (7000 ft)
- Humidity:
  - Server on: 8% to 80%
  - Server off: 8% to 80%

**Heat output:**

Approximate heat output in British thermal units (Btu) per hour:
- Minimum configuration: 1262 Btu (0.37 kilowatts)
- Maximum configuration: 4053 Btu (1.188 kilowatts)

**Electrical input:**
- Sine-wave input (50-60 Hz) required
- Input voltage low range:
  - Minimum: 100 V ac
  - Maximum: 127 V ac
- Input voltage high range:
  - Minimum: 200 V ac
  - Maximum: 240 V ac
- Input kilovolt-amperes (kVA) approximately:
  - Minimum: 0.08 kVA (ac power connected, server off)
  - Minimum: 0.38 kVA (dc power on, server idle)
  - Maximum: 1.2 kVA

# What your server offers

Your server uses the following features and technologies:

- **Impressive performance using an innovative approach to SMP**

  Your server supports up to four Intel Xeon Processor MP microprocessors. It comes with at least one microprocessor installed; you can install additional microprocessors to enhance performance and provide SMP capability.

- **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/enterprise/index.html.

  - **Active™ Memory**

    The Active Memory feature improves the reliability of memory through memory mirroring, memory scrubbing, and the Memory ProteXion™ feature. For more information, see "Active Memory" on page 6.

  - **Large system-memory capacity**

    The memory bus supports up to 32 GB of system memory. The memory controller supports error correcting code (ECC) for up to 16 industry-standard PC1600 or PC2100, CL2.5, 2.5v,133 MHz,184-pin, registered, double-data-rate (DDR), synchronous dynamic random access memory (SDRAM) dual inline memory modules (DIMMs). The memory controller also provides Chipkill memory protection. Chipkill memory protection is a technology that protects the server from a single chip failure on a DIMM.

  - **Memory ProteXion**

    The Memory ProteXion feature provides the equivalent of a hot-spare drive in a RAID array. It is based in the memory controller, and it enables the server to sense when a chip on a DIMM has failed and to route the data around the failed chip.

- **Systems-management capabilities**

  The server comes with a Remote Supervisor Adapter II installed. The adapter and the systems-management software that comes with your server enable 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.

- **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.

- **Integrated network support**

  Your server comes with two Gigabit Ethernet controllers on the I/O board, which support connection to a 10-Mbps, 100-Mbps, or 1-Gbps network. For more information, see "Configuring the Gigabit Ethernet controllers" on page 26.

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

  The *ServerGuide Setup and Installation* CD that comes with your server 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 21.

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

  Your server supports up to 6 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.

- **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 *Installation Guide*.

## Reliability, availability, and serviceability

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 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:

- 3-year warranty
- Active PCI-X (hot-plug) adapter capabilities
- Advanced Configuration and Power Interface (ACPI)
- Alert Standard Format (ASF) support
- Automatic restart after a power failure
- BIOS code boot-block recovery
- Chipkill memory protection
- Customer support center 24 hours per day, 7 days a week
- Cyclic redundancy check (CRC) SCSI data bus
- Diagnostic support of Ethernet adapters and RAID adapters
- Double-data-rate synchronous dynamic RAM (DDR SDRAM) with serial presence detect (SPD)
- Error correcting code (ECC) memory
- Error codes and messages
- Ethernet failover support
- Hot-swap hard disk drive bays
- IBM RXE-100 Remote Expansion Enclosure capabilities
- Light path diagnostics feature
- Memory scrubbing
- Menu-driven setup, system configuration, RAID configuration, and diagnostic programs
- Microprocessor built-in self-test (BIST)
- Monitoring support for temperatures, voltages, and fan speed
- Peripheral component interconnect (PCI) bus parity
- Power-on self-test (POST)
- Predictive Failure Analysis® on memory, microprocessor, hard disk drives, fans, and power supply
- Processor serial number access
- Read-only memory (ROM) checksums
- Redundant power supply capabilities

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2. Service availability will vary by country. Response time will vary depending on the number and nature of incoming calls.

- Redundant cooling
- Remote system management through the Remote Supervisor Adapter II
- Remote system problem-analysis support
- ROM-based diagnostic programs
- System error logging
- Vital product data (VPD), including serial-number information and replacement part numbers, stored in nonvolatile memory, for easier remote maintenance
- Wake on LAN capability
- X-Architecture technology

## Active Memory

Active™ Memory is an IBM feature that improves the reliability of memory through memory mirroring, memory scrubbing, and the Memory ProteXion™ feature.

## Memory scrubbing and Memory ProteXion

The Memory ProteXion feature is available only when the server has a 16-DIMM-connector memory cassette installed. Memory scrubbing tests the memory at regular intervals to detect and report potential memory errors before they can cause server outages.

If a detected error is recoverable, the Memory ProteXion feature corrects the error and rewrites the data to another memory location on the same DIMM. The error is logged in the error log so that you can determine whether preventive maintenance is necessary.

If there are not sufficient undamaged memory locations that the data can be rewritten to, the error is unrecoverable. Other conditions can also cause unrecoverable errors. If a detected error is unrecoverable, LEDs on the light path diagnostics panel are lit to indicate the failing DIMM.

You do not have to enable memory mirroring to use memory scrubbing and the Memory ProteXion feature.

## Memory mirroring

Memory mirroring is available only when the server has a 16-DIMM-connector memory cassette installed. Memory mirroring stores data in memory port 1 and memory port 2 simultaneously. To support memory mirroring, you must install identical dual inline memory modules (DIMMs) in memory port 1 and memory port 2. For more information, see the section about installing memory modules in the *Option Installation Guide* on the IBM *xSeries Documentation* CD.

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

To enable memory mirroring through the Configuration/Setup Utility program, select **Advanced Setup** from the main menu, and select **Memory Configuration**. For more information about using the Configuration/Setup Utility program, see Chapter 2, "Configuring the server," on page 15.

# 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 XP Professional, Red Hat Linux, SuSE Linux, Novell NetWare, and Caldera OpenUNIX®. 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 documents on the CD, and the following Web pages:

**IBM xSeries Systems Management page**

> http://www.ibm.com/servers/eserver/xseries/systems_management/ xseries_sm.html

> This Web page presents an overview of IBM Systems Management and IBM Director.

**IBM Universal Manageability page**

> http://www.ibm.com/pc/us/pc/um/index.html

> This Web page links to an IBM portfolio of advanced management tools that help reduce costs and increase availability throughout the life cycle of a product.

# The Update*Xpress* program

The Update*Xpress* 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 Update*Xpress* 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, LEDs, and power

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

# Front view

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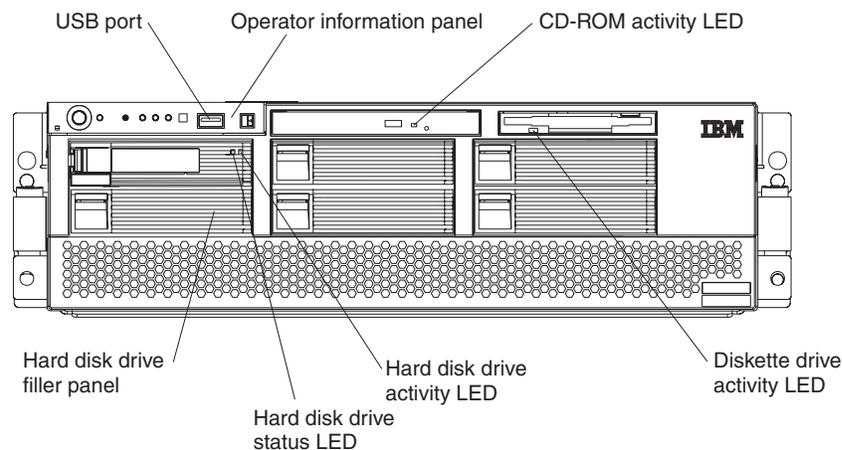


**Operator information panel:** This panel contains controls, indicators, and a USB port. Swing it open to see the light path diagnostics LEDs on the side surface. See "Operator information panel" on page 11 for details.

**Diskette drive activity LED:** When this LED is lit, it indicates that the diskette drive is in use.

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

**Hard disk drive filler panels:** A filler panel and air baffle is used to cover empty hard disk drive bays. A filler panel and air baffle must be installed in each empty bay to ensure proper system cooling. Your server comes with five filler panels and air baffles installed, and one completely empty bay.

**Hard disk drive activity LED:** When this LED is flashing, it indicates that the associated hard disk drive is in use.

**Hard disk drive status LED:** When this LED is lit continuously, it indicates that the associated hard disk drive has failed. 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 the integrated SCSI controller with RAID capabilities, a flashing status LED indicates that the drive is a secondary drive in a mirrored pair and the drive is being synchronized.
- When the drive is connected to an optional ServeRAID™ controller, 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 is identifying the drive.

**USB port:** You can connect a USB device to this connector.

## Rear view

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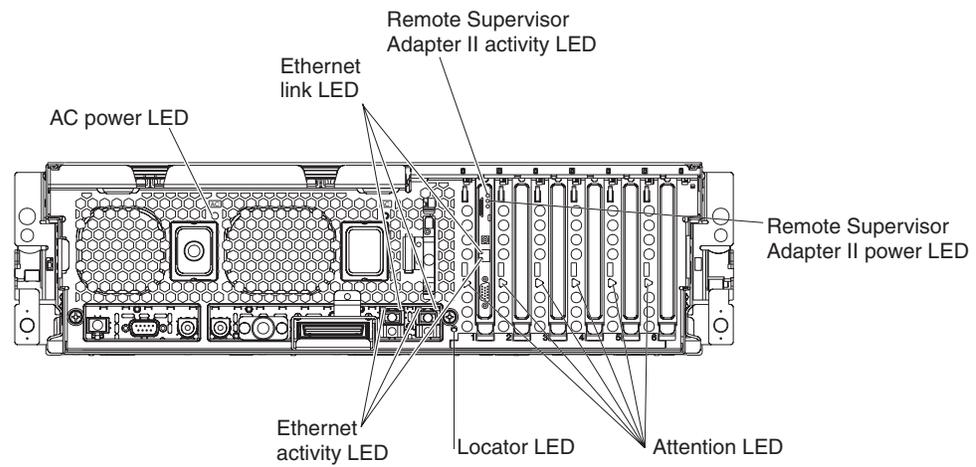


**AC power LED:** Each hot-swap power supply has an ac power LED that is visible from the rear of the server. The power supply also has an ac power LED and a dc power LED on the top of the power supply, visible when the server cover is removed. When the ac power LED is lit, ac input to the power module is present and within specifications. During typical operation, both the ac and dc power LEDs on the top of the power supply are lit. For any other combination of LEDs, see the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *xSeries Documentation* CD.

**Ethernet link LEDs:** When these LEDs (one for the Remote Supervisor Adapter II, two for the network) are lit, they indicate that the related Ethernet link is operational.

**Remote Supervisor Adapter II activity LED:** When this LED is flashing, the Remote Supervisor Adapter II is functioning normally. When the LED is lit continuously, there is a problem with the Remote Supervisor Adapter II. When the LED is off, the Remote Supervisor Adapter II is not functioning. This LED is the topmost LED on the Remote Supervisor Adapter II.

**Remote Supervisor Adapter II power LED:** When this LED is lit, it indicates that power is being supplied to the Remote Supervisor Adapter II.

**Attention LED:** When this LED is on steady, it indicates that the adapter in the corresponding slot is ready to be removed (hot-pluggable adapter only) or there is a problem with the adapter. When this LED is flashing, it indicates that an operation is in progress or that the adapter requires attention, depending on the operating system. See the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *xSeries Documentation* CD for troubleshooting information.

**Locator LED:** Use this blue LED to visually locate the server if it is in a location with numerous other servers. A locator LED is also on the operation information panel on the front of the server. You can use the Management Processor Assistant (MPA) in IBM Director to cause this LED to be lit, off, or flashing. If the server is connected to an RXE-100 Remote Expansion Enclosure, pressing the Locate button on the enclosure causes this LED to be lit.

**Note:** This LED flashes while the server is being turned on or restarted, and turns off when POST is complete.

**Ethernet activity LEDs:** When these LEDs (one for the Remote Supervisor Adapter II, two for the network) are lit, they indicate that activity is taking place on the related network.

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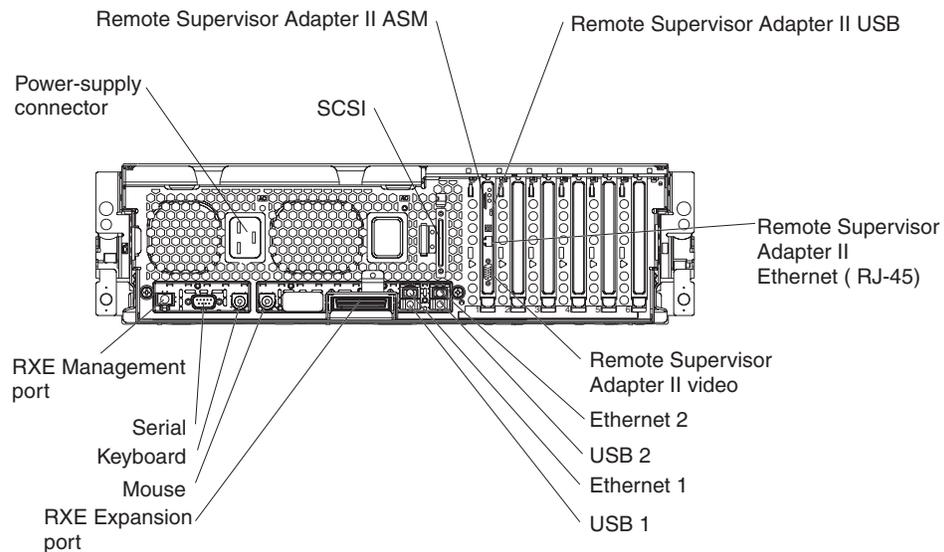


**Power supply connector:** Connect one end of the power-supply power cord to this connector and connect the other end into an ac power source. The server comes with one or two hot-swap power supplies, depending on the server model. If your server comes with one hot-swap power supply, you can add a second hot-swap power supply to obtain full power redundancy. Connect the power supplies to separate ac power circuits for power redundancy.

**SCSI connector:** Connect an external SCSI device to this connector.

**Remote Supervisor Adapter II ASM connector:** Attach the ASM breakout cable to this connector to enable system management through the serial connectors and through the ASM RS-485 connectors.

**Remote Supervisor Adapter II USB connector:** This connector is not available for use.

**Remote Supervisor Adapter II Ethernet connector:** Use this connector to connect the Remote Supervisor Adapter II to a network to manage the server from a remote location.

**Note:** The external power connector on the Remote Supervisor Adapter II is not supported on the xSeries 365 server.

**Remote Supervisor Adapter II video connector:** Connect your server monitor to this connector.

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

**USB connectors:** Connect USB devices to these connectors.

**RXE Expansion Port:** Connect the RXE Expansion Port of an optional IBM RXE-100 Remote Expansion Enclosure to this connector. See the information about RXE cabling in the *Option Installation Guide* on the IBM *xSeries Documentation* CD.

**Mouse connector:** Connect a mouse or other pointing device to this connector.

**Keyboard connector:** Connect a PS/2 (non-USB) keyboard to this connector.

**Serial connector:** Connect a serial device to this connector.

**RXE Management Port:** Connect the RXE Management A (In) Port of an optional IBM RXE-100 Remote Expansion Enclosure to this connector. See the information about RXE cabling in the *Option Installation Guide* on the IBM *xSeries Documentation* CD.

To enable remote server management through a network, use the Remote Supervisor Adapter II Ethernet port. To enable remote server management using a modem, use the Remote Supervisor Adapter II serial port on the breakout cable. To connect the server with another server, use the Remote Supervisor Adapter II ASM interconnect port.

## Operator information panel

The following illustration shows the controls, indicators, and USB connector on the operator information panel.
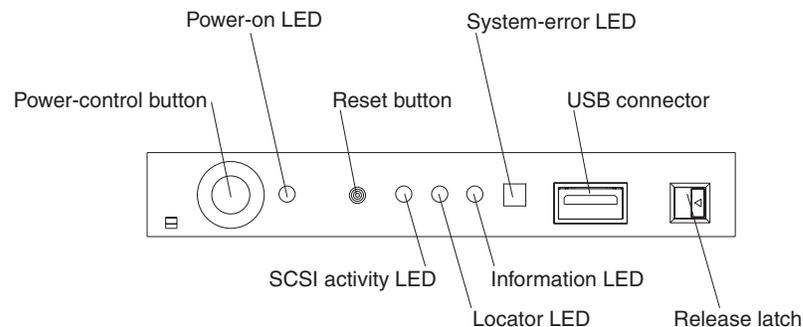


**Power-control button:** Press this button to turn the server on and off manually. A power-control-button shield comes with your server. You can install this disk-shaped shield to prevent the server from being turned off accidentally.

**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 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. A power LED is also on the rear of the server.

**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.

**Reset button:** Press this button to reset the server and run the power-on self-test (POST). You might have to use a pen or the end of a straightened paper clip to press the button.

**SCSI activity LED:** When this LED is lit, it indicates that there is activity on the SCSI bus.

**Locator LED:** Use this blue LED to visually locate the server if it is in a location with numerous other servers. A locator LED is also on the rear of the server. You can use the Management Processor Assistant (MPA) in IBM Director to cause this LED to be lit, off, or flashing. If the server is connected to an RXE-100 Remote Expansion Enclosure, pressing the Locate button on the enclosure causes this LED to be lit.

**Note:** This LED flashes while the server is being turned on or restarted, and turns off when POST is complete.

**Information LED:** When this LED is lit, it indicates that a noncritical event has occurred.

**System-error LED:** When this LED is lit, it indicates that a system error has occurred. An LED on the light path diagnostics panel on the side of the operator information panel is also lit to help isolate the error. For details, see the section about the light path diagnostic panel and internal LED locations in the *Option Installation Guide* on the IBM *xSeries Documentation* CD.

**USB connector:** You can connect a USB device to this connector.

**Release latch:** Press this latch to release the operator information panel to access the light path diagnostics LED panel.

## Light path diagnostics LED panel

Swing the operator information panel out to see the light path LED panel on the side of the operator information panel. The following illustration shows the LEDs on the light path LED panel.
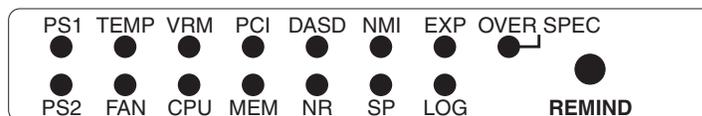


**PS1 LED:** When this LED is lit, it indicates that power supply 1 has failed.

**PS2 LED:** When this LED is lit, it indicates that power supply 2 has failed.

**TEMP LED:** When this LED is lit, it indicates that the system temperature has exceeded a threshold level.

**FAN LED:** When this LED is lit, it indicates that a hot-swap fan or power-supply fan has failed or is operating too slowly. A failing fan can also cause the OVER TEMP LED to be lit.

**VRM LED:** When this LED is lit, it indicates that a VRM on the microprocessor tray has failed.

**CPU LED:** When this LED is lit, it indicates that a microprocessor has failed.

**PCI LED:** When this LED is lit, it indicates that an error has occurred on a PCI bus.

**MEM LED:** When this LED is lit, it indicates that a memory error has occurred.

**DASD LED:** When this LED is lit, it indicates that a hot-swap hard disk drive has failed.

**NR LED:** When this LED is lit, it indicates that two power supplies are present but the power supplies are not redundant.

**NMI LED:** When this LED is lit, it indicates that there has been a nonmaskable interrupt (NMI).

**SP LED:** When this LED is lit, it indicates that the service processor has encountered an error.

**EXP LED:** When this LED is lit, it indicates that an attached I/O expansion unit has failed.

**LOG LED:** When this LED is lit, it indicates that you should view the event log or the Remote Supervisor Adapter II log for information about a non-optimal condition.

**OVER SPEC LED:** When this LED is lit, it indicates that there is greater demand on the power supplies than they are specified to deliver.

**Remind button:** Press this button to reset the system-error LED on the operator information panel and place the server in remind mode. In remind mode, the fault has not been cleared but the system-error LED is flashing (once every 2 seconds) instead of lit; the system-error LED will be lit if another system error occurs.

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

## Turning on the server

Approximately 20 seconds after the server is connected to ac power, the power-control button becomes active, and 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.
- You can turn on the server through the Remote Supervisor Adapter or Remote Supervisor Adapter II user interface.
- The system-management software for the Remote Supervisor Adapter II in your server 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.

**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 requests from the service processor, such as a remote request to turn on the server. To remove all power from the server, you must disconnect it from the power source.

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

**Statement 5:**



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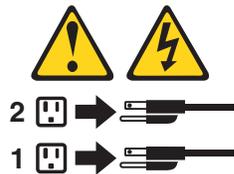


The server can be turned off in any of the following ways:

- You can turn off the server from the operating system, if your operating system supports this feature. After an orderly shutdown of the operating system, the server will be turned off automatically.
- You can press the power-control button to start an orderly shutdown of the operating system and turn off the server, if your operating system supports this feature.
- If the operating system stops functioning, you can press and hold the power-control button for more than 5 seconds to turn off the server.
- The server can be turned off from the server Remote Supervisor Adapter II user interface.
- If the Wake on LAN feature turned on the server, the Wake on LAN feature can turn off the server.
- The 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. 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 16.

- **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 an integrated SCSI controller with RAID capabilities, and to simply the installation of your operating system. For information about using this CD, see "Using the ServerGuide Setup and Installation CD" on page 21.

- **Preboot Execution Environment (PXE) boot agent utility program**

  The PXE boot agent utility program is part of the BIOS code in your server. Use it to change network startup (boot) protocols and startup order and to select operating-system wake-up support. For information about using this utility program, see "Using the PXE boot agent utility program" on page 30.

- **RAID configuration programs**

  - **LSI Logic Configuration Utility program**

    Use the LSI Logic Configuration Utility to configure the integrated SCSI controller with RAID capabilities and the devices that are attached to it. For information about using this utility program, see "Using the LSI Logic Configuration Utility program" on page 24.

  - **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 or if you are using the RAID capabilities of the SCSI controller, 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 25.

- **Service processor firmware update utility process**

  For information about updating the integrated service processor firmware, see "Updating the service processor firmware" on page 26. For information about updating the firmware on the Remote Supervisor Adapter II, see "Setting up the Remote Supervisor Adapter II" on page 27.

- **Gigabit Ethernet controller configuration process**

  For information about configuring the Ethernet controllers, see "Configuring the Gigabit Ethernet controllers" on page 26.

- **Remote Supervisor Adapter II configuration process**

  For information about setting up and cabling the Remote Supervisor Adapter II, see "Setting up the Remote Supervisor Adapter II" on page 27.

# 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
- 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 legacy keyboard and mouse support
- Resolve configuration conflicts

# Starting the Configuration/Setup Utility program

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

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, speed, and cache sizes 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. 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 your server, the serial number, the revision level or issue date of the BIOS and diagnostics code stored in electrically erasable programmable ROM (EEPROM), and the revision levels of the firmware on the Remote Supervisor Adapter II.

  - **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 SCSI and Ethernet controllers 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 SCSI controller and no SCSI adapter is installed, the server will have no SCSI capability. If you disable the integrated Ethernet controller and no Ethernet adapter is installed, the server will have no Ethernet capability. 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 Host Controller** and **USB BIOS Legacy Support** options.

  **Note:** If the USB Host Controller is disabled, then the Remote Supervisor Adapter II remote keyboard, remote mouse, remote disk, OS watchdog, and in-band management functions are also disabled.

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

- **Date and Time**

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

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

- **System Security**

  Select this choice to set passwords. See "Passwords" on page 19 for more information about passwords. You can also enable the chassis-intrusion detector to alert you each time the server cover is removed.

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

  – **Power-on Password**

    Select this choice to set or change a power-on password. See "Power-on password" on page 20 for more information.

  – **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 I/O board.

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

    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 21 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.

  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 your

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 PS/2® keyboard is detected, the USB Legacy operation will be disabled.

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.

  – **System Partition Visibility**

    Select this choice to specify whether the System Partition is to be visible or hidden.

  – **PCI Slot/Device Information**

    Select this choice to view system resources used by installed PCI/PCI-X devices. PCI/PCI-X devices are usually configured automatically. This information is saved when you exit. The **Save Settings**, **Restore Settings**, and **Load Default Settings** choices on the Configuration/Setup Utility main menu do not save the PCI Slot/Device Information settings.

  – **Memory Settings**

    Select this choice to manually enable a pair of memory connectors.

    If a memory error is detected during POST or memory configuration, the server will automatically disable the failing pair of memory connectors and continue operating with reduced memory capacity. If this occurs, you must manually enable the set of memory connectors after the problem is corrected. Select **Memory Settings** from the **Advanced Setup** menu, and use the arrow keys to highlight the pair of memory connectors that you want to enable; then, use the arrow keys to select **Enable**.

  – **CPU Options**

    Select this choice to enable or disable the Hyper-threading Technology. In addition, this choice displays the system cache type (write-back or write-through). Selecting write-back mode provides better system performance.

  – **Integrated System Management Processor Settings**

    Select this choice to enable or disable the **Reboot on System NMI** option on the menu. If you enable this option, the server will automatically restart 60 seconds after the service processor issues a nonmaskable interrupt (NMI) to the server. If you disable this option, the server will not restart. **Enable** is the default setting.

  – **RSA II Settings**

    Select this choice to view or change the MAC address, IP address, and DHCP control settings for the Remote Supervisor Adapter II.

  – **RXE-100 Slot Count**

Select this choice to specify the number of RXE-100 slots to request (0, 6, or 12).

- **Error Logs**

  Select this choice to view or clear error logs.

  – **POST Error Log**

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

  – **System Error Log**

    Select this choice to view the system error log, which contains all system error and warning messages that have been generated. Use the arrow keys to move between pages in the log. If an optional IBM Remote Supervisor Adapter II is installed, the full text of the error messages is displayed; otherwise, the log contains only numeric error codes. Run the diagnostic program to get more information about error codes that occur. See the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *xSeries Documentation* CD for instructions. Select **Clear error logs** to clear the system error log.

- **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.

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

When 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. Start the Configuration/Setup Utility program and reset the power-on password.
- Remove the server battery and then reinstall it. See the *Option Installation Guide* for instructions for removing the battery.
- Change the position of the power-on password override jumper (J20 on the I/O board) to bypass the power-on password check.

  **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 beginning on page v. Do not change settings or move jumpers on any system-board switch or jumper blocks that are not shown in this document.

  The following illustration shows the location of the power-on password override jumper.
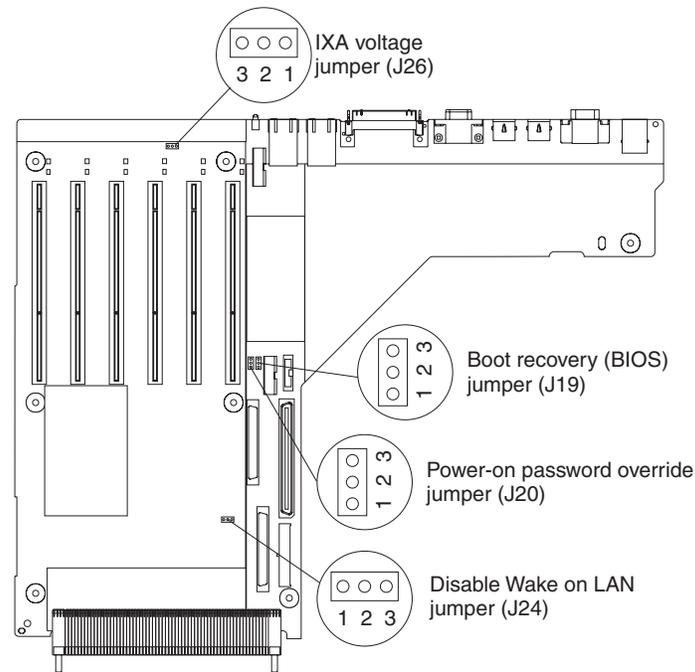


While the server is turned off, move the jumper on J20 from pins 1 and 2 to pins 2 and 3. You can then start the Configuration/Setup Utility program and reset the power-on password. After you reset the password, turn off the server again and move the jumper back to pins 1 and 2.

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** choice is on the Configuration/Setup Utility menu only if an optional IBM
Remote Supervisor Adapter 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 I/O board.

## 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 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 your ServeRAID adapter or
  integrated SCSI controller with RAID capabilities
- 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 (with LSI chip sets for ServeRAID adapters only)
- 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 365**.
5. Click **Continue**.
6. In the **View by document type** field, select **OS installation**.
7. Select the instructions for your operating system.

## Using the RAID configuration programs

Use the LSI Logic Configuration Utility program and ServeRAID Manager to configure and manage redundant array of independent disks (RAID) arrays. Be sure to use these programs as described in this document.

- Use the LSI Logic Configuration Utility program to:
  - Perform a low-level format on a SCSI hard disk drive
  - View or change SCSI IDs for attached devices
  - Set SCSI protocol parameters on SCSI hard disk drives
- Use ServeRAID Manager to:
  - Configure arrays
  - View your RAID configuration and associated devices
  - Monitor operation of your RAID controllers

In addition, an LSI command-line configuration program (CFG1030) is available from http://www.ibm.com/pc/support/.

Consider the following information when using the LSI Logic Configuration Utility program and ServeRAID Manager to configure and manage arrays:

- Use the ServeRAID Manager program to configure your arrays before you install your operating system. Do not use the LSI Logic Configuration Utility program to configure arrays.
- The integrated SCSI controller with RAID capabilities in your server supports only RAID level-1 with a hot-spare drive installed. Installing an optional ServeRAID controller provides additional RAID levels.
- If your server has a ServeRAID controller installed, you can use ServeRAID Manager to configure the integrated SCSI controller with RAID capabilities for other supported RAID levels.
- When you create a RAID level-1 (mirrored) pair, all drives must be on the same channel.
- To update the firmware and BIOS codes for an optional ServeRAID controller, you must use the IBM *ServeRAID Support* CD that comes with the controller.
- If you install a different type of RAID controller, see the documentation that comes with the controller for information about viewing and changing SCSI settings for attached devices.

# Using the LSI Logic Configuration Utility program

Use the LSI Logic Configuration Utility program to:

- Perform a low-level format of a SCSI hard disk drive
- Set a SCSI device scan order
- View or change SCSI IDs for attached devices
- Set SCSI protocol parameters on SCSI hard disk drives

The integrated SCSI controller with RAID capabilities supports redundant array of independent disks (RAID) arrays. You can use the LSI Logic Configuration Utility program to configure RAID level 1 for a single pair of attached devices. If you install a different type of RAID adapter, follow the configuration instructions in the documentation that comes with the adapter to view or change SCSI settings for attached devices.

The following sections provide instructions for starting the LSI Logic Configuration Utility program and performing selected functions.

### Starting the LSI Logic Configuration Utility program

Complete the following steps to start the LSI Logic Configuration Utility program:

1. Turn on the server.
2. When the `<<< Press <CTRL><C> to start LSI Logic Configuration Utility >>>` prompt appears, press Ctrl+C.

   **Note:** If an administrator password has been set, you are prompted to type the password to start the LSI Logic Configuration Utility program.

3. Use the arrow keys to select a controller (channel) from the list of adapters; then, press Enter.
4. Follow the instructions on the resulting screen to change the settings of the selected items; then, press Enter. The **Device Properties** and **Mirroring Properties** choices produce additional screens of parameters to review or change.

### Formatting a SCSI hard disk drive

Low-level formatting removes all data from the hard disk drive. If there is data on the disk that you want to save, back up the hard disk drive before continuing this procedure.

**Note:** Before you format a SCSI hard disk, make sure that the disk is not part of a mirrored pair. From the list of adapters, select the controller (channel) for the drive that you want to format. Select **Mirroring Properties** and make sure that the mirroring value for the drive is **None**.

Complete the following steps to format a drive:

1. From the list of adapters, select the controller (channel) for the drive that you want to format.
2. Select **Device Properties**.
3. Use the arrow keys (↑ and ↓) to highlight the drive that you want to format.
4. Use the arrow keys (← and →) or the End key to scroll to the right.
5. Select **Format**; then, press Enter to start the low-level formatting operation.

# 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 your RAID configuration and associated devices
- Monitor the operation of your 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 for additional information about RAID technology and instructions for using ServeRAID Manager to configure your integrated SCSI controller with RAID capabilities. 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 your 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-ROM 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 CD-ROM drive.
7. Restart the server.

***Using custom configuration:*** Complete the following steps to use custom configuration:

1. In the ServeRAID Manager tree, click the controller.
2. Click **Custom configuration**.
3. Click **Next**. The "Create arrays" window opens.
4. From the list of ready drives, select the two drives that you want to group into the array.
5. Click the 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 icon to add the drive.
7. Click **Next**. The "Configuration summary" window opens.
8. Review the information in the "Configuration summary" window. To change the configuration, click **Back**.
9. 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.
10. Exit from ServeRAID Manager and remove the CD from the CD-ROM 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**.

## Configuring the Gigabit Ethernet controllers

The Ethernet controllers are integrated on the I/O 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 your 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 need to set any jumpers or configure the controllers. However, you must install a device driver to enable the operating system to address the controllers. Install the device drivers from the ServerGuide CD or from the *Broadcom NetXtreme Gigabit Ethernet Software CD* that comes with your server. For information about configuring the Ethernet controllers, see the *Broadcom NetXtreme Gigabit Ethernet Software CD*. For updated information about configuring the controllers, go to http://www.ibm.com/pc/support/.

## Updating the service processor firmware

To update only the firmware for the Remote Supervisor Adapter II and the integrated service processor, download the firmware update package for your server from the IBM Support Web site at http://www.ibm.com/pc/support/ and follow the instructions in the text file on the Web site.

To update the server BIOS, device drivers, and other firmware including the firmware for the Remote Supervisor Adapter II and integrated service processor, download and apply the system service package for your server (see "Setting up the Remote Supervisor Adapter II").

## Setting up the Remote Supervisor Adapter II

This section describes how to set up, cable, and configure the Remote Supervisor Adapter II for use on an Advanced System Management (ASM) network 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* on the IBM *xSeries Documentation* CD for information about how to configure and use an ASM network 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 you have completed the following procedures before setting up the Remote Supervisor Adapter II:

- Install the operating system, using the ServerGuide program and the documentation that comes with the operating system.
- If you plan to use the remote disk function, install the following software:
  - On the server, install Microsoft Windows 2000 with Service Pack 3 or later.
  - On the client system, install Microsoft Windows 2000 or later and the Java™ 1.4 Plug-in or later.
- Make sure that the server has an Internet connection, so that you can download software and firmware from the IBM Support Web site during the installation process.
- If you plan to configure Simple Network Management Protocol (SNMP) trap alerts on the Remote Supervisor Adapter II, install and compile the management information base (MIB) on your SNMP manager. The Remote Supervisor Adapter II firmware, the integrated service processor firmware, and the MIB are available on the *ServerGuide Setup and Installation* CD and are fully functional. You can download the latest versions from http://www.ibm.com/pc/support/.
- If you plan to use the Web-based interface to access the Remote Supervisor Adapter II remotely, install the Java Plug-in 1.4 or later and one of the following Web browsers on the client system:
  - Microsoft Internet Explorer version 5.5 with the latest Service Pack
  - Netscape Navigator version 7.0 or later
  - Mozilla version 1.3 or later (not supported on Microsoft Windows operating systems, and does not support the remote disk function)
  
  The Web browser must be Java-enabled and must support JavaScript™.

## Cabling the Remote Supervisor Adapter II

You can manage the server remotely through the Remote Supervisor Adapter II using one of the user interfaces and one of the connection methods that are described in the following table.

*Table 1. Cabling tasks to enable remote access to the Remote Supervisor Adapter II*

| User interface to Remote Supervisor Adapter II | Connection to Remote Supervisor Adapter II |
| --- | --- |
| ASM Web-based interface using HTTP | LAN using the Ethernet connector |
| Command-line interface using Telnet | |
| Command-line interface using a null modem cable | Serial (COM1 or COM2) connector on the breakout cable |
| ASM Web-based interface using point-to-point protocol (PPP) | Serial (COM1) connector on the breakout cable |
| Command-line interface using Telnet over PPP | |

**Note:** For cabling to access the serial redirect function, see the *Remote Supervisor Adapter II Installation Guide* on the IBM *xSeries Documentation* CD.

If you plan to set up an ASM interconnect network, before you begin cabling the server, review the network configuration examples in the *Remote Supervisor Adapter II Installation Guide* on the IBM *xSeries Documentation* CD.

1. Connect the video cable from the monitor to the video connector on the Remote Supervisor Adapter II.

2. If you plan to use a serial connection for the user interface or if you plan to connect the server to an ASM interconnect network, connect the ASM breakout cable to the ASM connector on the Remote Supervisor Adapter II.
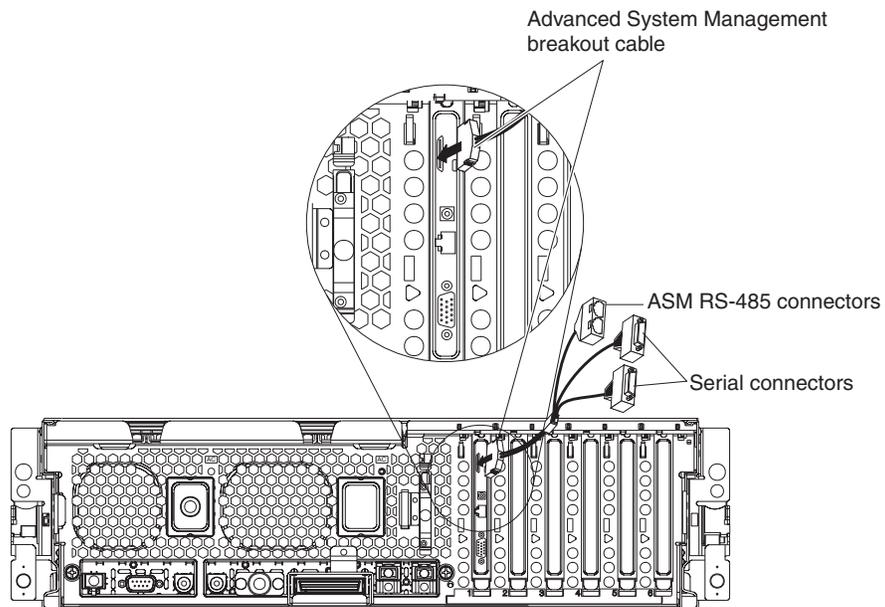


3. Complete the following steps to connect the Ethernet cables.

   **Attention:** To avoid damaging the Ethernet connector on the Remote Supervisor Adapter II, *do not* connect the ASM interconnect module to the Ethernet connector.

   a. Connect one end of a Category 3, Category 4, or Category 5 Ethernet cable to the Ethernet connector on the Remote Supervisor Adapter II. Connect the other end of the cable to the network.

b.  Check the Ethernet LEDs to make sure that the network connection is working. The following illustration shows the locations of the LEDs.

Adapter activity LED

Power LED

Ethernet link LED

Ethernet activity LED
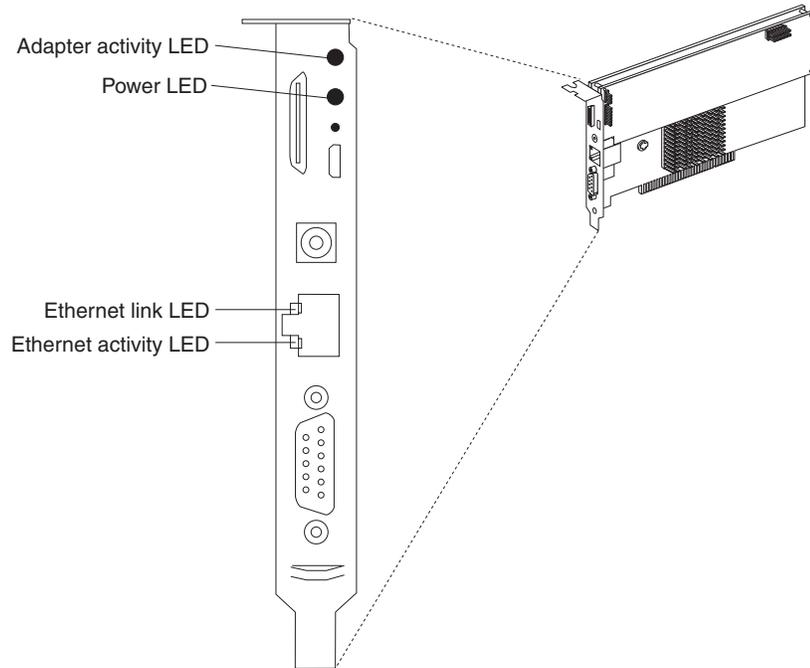
## Updating Remote Supervisor Adapter II software and firmware

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
*   Server diagnostics code update
*   Remote Supervisor Adapter II device drivers
*   Remote Supervisor Adapter II firmware update
*   Integrated service processor firmware update
*   Video device driver
*   Firmware-update utility program

Complete the following steps to download and install the software and firmware.

1.  Go to http://www.ibm.com/pc/support/.
2.  In the left navigation pane, click **Search PC support**.
3.  In the "Search PC support" window, under **Additional search options**, in the **Restrict to this document type** field, select **Downloads and drivers**
4.  In the **Restrict to this brand** field, select **Servers**.
5.  Wait for the page to automatically refresh; then, in the **Restrict to this family** field, select **xSeries 365** (the server in which the Remote Supervisor Adapter II is installed).
6.  Wait for the page to automatically refresh; then, in the **Enter search terms** field, type "`system service package`". (Do not use the **Search** field at the top of the page.)
7.  Click **Search**.

8. Select the system service package for the server in which the Remote Supervisor Adapter II is installed.

9. 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.)

10. Extract the package files into *d*:\ibmssp.
   - The package file for Windows systems is self-extracting; double-click the .exe file.
   - The package file for Linux systems is a tar gzipped package; use an appropriate Linux utility to extract the files.

11. See the readme.txt file that is extracted into the *d*:/ibmssp directory for a list of the file names and their descriptions.

12. To ensure correct software installation, follow the detailed installation instructions in *Remote Supervisor Adapter II Installation Instructions*, which is in Portable Document Format (PDF) in the *d*:/ibmssp directory. Then, continue with "Completing the setup."

**Important:** Whenever you update the Remote Supervisor Adapter II firmware, be sure to flush the Java cache. See the *Remote Supervisor Adapter II Installation Instructions* for details and instructions.

# Completing the setup

See the *IBM Remote Supervisor Adapter II User's Guide* on the IBM *xSeries Documentation* CD for instructions for completing the configuration, including the following procedures:
- Configuring the Ethernet and serial ports
- Defining login IDs and passwords
- Selecting the events that will receive alert notifications
- Monitoring remote server status using the Remote supervisor Adapter II Web-based interface
- Controlling the server remotely
- Virtually attaching a remote diskette drive, CD-ROM 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 need to replace the adapter. For more information, see the *Remote Supervisor Adapter II User's Guide*.

# Using the PXE boot agent utility program

Use the Preboot Execution Environment (PXE) boot agent utility program to enable or disable operating-system wake-up support.

**Note:** Your server does not support changing the network boot protocol or specifying the startup order of devices through the PXE boot agent utility program.

# Starting the PXE boot agent utility program

Complete the following steps to start the PXE boot agent utility program:

1. Turn on the server.

2. When the `Broadcom NetXtreme Ethernet Boot Agent Version X.X.XX` prompt appears, press Ctrl+S. You have 2 seconds (by default) to press Ctrl+S after the prompt appears.

   **Note:** If the PXE setup prompt is not displayed, use the Configuration/Setup Utility program to set the Ethernet PXE startup option.

3. Use the arrow keys and press Enter to select a choice from the menu.

4. Follow the instructions on the screen to change the settings of the selected items; then, press Enter.

## PXE boot agent utility menu choices

The following choices are on the PXE Boot Agent Utility menu:

- **Boot Protocol**

  **PXE** is the default setting. Do not change this setting; your server does not support any other network boot protocols.

- **Boot Strap Type**

  Select this choice to specify the type of boot strap. You can select Auto Detect (the default), BBS, Int18h, or Int19h.

- **Hide Setup Prompt**

  Select this choice to enable or disable the PXE setup prompt. **Disable** is the default setting. When the prompt is enabled, the prompt `Press Ctrl+S to enter the setup menu` appears under the initializing prompt.

- **Banner Message Timeout**

  Select this choice to specify the amount of time (in seconds) that the server will wait for you to press Ctrl+S after the prompt appears. You can select 2 (default), 3, 5, or 8 seconds.

- **Link Speed**

  Select this choice to set the link speed for the LAN connection. The default is AutoNeg (auto-negotiate).

- **Pre-boot Wake on LAN**

  Select this choice to enable (the default) or disable the pre-boot Wake on LAN feature.

  If you are using an Advanced Configuration and Power Interface (ACPI) aware operating system, such as Microsoft Windows 2000, disable this choice to use Wake on LAN support. Otherwise, enable it.

  If you are using a non-ACPI-aware operating system, do not send wake-up packets to the server while it is turned on. If you send a wake-up packet to the server while it is turned on and you are then unable to turn off the server, see "Power problems" in the "Error symptoms" section in the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *xSeries Documentation* CD.

# 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 documents 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 documents, online documents, README files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/pc/support/ and follow the instructions. Also, you can order documents through the IBM Publications Ordering System at
http://www.elink.ibmlink.ibm.com/public/applications/publications/cgibin/pbi.cgi.

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# 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/. If you click **Profile** from the support page, you can create a customized support page. The support page has many sources of information and ways for you to solve problems, including:

- Diagnosing problems, using the IBM Online Assistant
- Downloading the latest device drivers and updates for your products
- Viewing Frequently Asked Questions (FAQ)
- Viewing hints and tips to help you solve problems
- Participating in IBM discussion forums
- Setting up e-mail notification of technical updates about your products

# 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.

# 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.

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. IBM Statement of Limited Warranty Z125-4753-07 11/2002

## Part 1 - General Terms

*This Statement of Limited Warranty includes Part 1 - General Terms, Part 2 - Country-unique Terms, and Part 3 - Warranty Information. The terms of Part 2 replace or modify those of Part 1. The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise.* **Nothing in this Statement of Limited Warranty affects any statutory rights of consumers that cannot be waived or limited by contract.**

### What this Warranty Covers

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications ("Specifications") which are available on request. The warranty period for the Machine starts on the original Date of Installation and is specified in Part 3 - Warranty Information. The date on your invoice or sales receipt is the Date of Installation unless IBM or your reseller informs you otherwise. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part. Unless IBM specifies otherwise, these warranties apply only in the country or region in which you purchased the Machine.

**THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SOME STATES OR JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD. SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.**

### What this Warranty Does not Cover

This warranty does not cover the following:
*  any software programs, whether pre-loaded or shipped with the Machine, or installed subsequently;
*  failure resulting from misuse (including but not limited to use of any Machine capacity or capability, other than that authorized by IBM in writing), accident, modification, unsuitable physical or operating environment, or improper maintenance by you;
*  failure caused by a product for which IBM is not responsible; and
*  any non-IBM products, including those that IBM may procure and provide with or integrate into an IBM Machine at your request.

The warranty is voided by removal or alteration of identification labels on the Machine or its parts.

IBM does not warrant uninterrupted or error-free operation of a Machine.

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, is provided **WITHOUT WARRANTIES OF ANY KIND**.

### How to Obtain Warranty Service

If the Machine does not function as warranted during the warranty period, contact IBM or your reseller to obtain warranty service. If you do not register the Machine with IBM, you may be required to present proof of purchase as evidence of your entitlement to warranty service.

### What IBM Will Do to Correct Problems

When you call for service, you must follow the problem determination and resolution procedures that IBM specifies. A technician will attempt to make an initial diagnosis of your problem and help you resolve it over the telephone.

The type of warranty service applicable to your Machine is specified in Part 3 - Warranty Information.

You are responsible for downloading and installing designated Machine Code (microcode, basic input/output system code (called "BIOS"), utility programs, device drivers, and diagnostics delivered with an IBM Machine) and other software updates from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides.

If your problem can be resolved with a Customer Replaceable Unit ("CRU") (e.g., keyboard, mouse, speaker, memory, hard disk drive and other easily replaceable parts), IBM will ship these parts to you for replacement by you.

If the Machine does not function as warranted during the warranty period and your problem cannot be resolved over the telephone, through your application of Machine Code or software updates, or with a CRU, IBM or your reseller, if approved by IBM to provide warranty service, will either, at its discretion, 1) repair it to make it function as warranted, or 2) replace it with one that is at least functionally equivalent. If IBM is unable to do either, you may return the Machine to your place of purchase and your money will be refunded.

IBM or your reseller will also manage and install selected engineering changes that apply to the Machine.

### Exchange of a Machine or Part

When the warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

### Your Additional Responsibilities

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to:
1.  ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2.  obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3.  where applicable, before service is provided:
    a.  follow the service request procedures that IBM or your reseller provides;
    b.  backup or secure all programs, data, and funds contained in the Machine;
    c.  provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit IBM to fulfill its obligations; and
    d.  inform IBM or your reseller of changes in the Machine's location.
4.  (a) ensure all information about identified or identifiable individuals (Personal Data) is deleted from the Machine (to the extent technically possible), (b) allow IBM, your reseller or an IBM supplier to process on your behalf any remaining Personal Data as IBM or your reseller considers necessary to fulfill its obligations under this Statement of Limited Warranty (which may include shipping the Machine for such processing to other IBM service locations around the world), and (c) ensure that such processing complies with any laws applicable to such Personal Data.

## Limitation of Liability

IBM is responsible for loss of, or damage to, your Machine only while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller are responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM for any reason. You should remove all such information from the Machine prior to its return.

Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), except for any liability that cannot be waived or limited by applicable laws, IBM is liable for no more than
1.  damages for bodily injury (including death) and damage to real property and tangible personal property; and
2.  the amount of any other actual direct damages, up to the charges (if recurring, 12 months' charges apply) for the Machine that is subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

**UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING EVEN IF INFORMED OF THEIR POSSIBILITY: 1) THIRD PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, DATA; 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; OR 4) LOST**

PROFITS, BUSINESS REVENUE, GOODWILL OR ANTICIPATED SAVINGS. SOME STATES OR JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

### Governing Law

Both you and IBM consent to the application of the laws of the country in which you acquired the Machine to govern, interpret, and enforce all of your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Statement of Limited Warranty, without regard to conflict of law principles.

**THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE OR JURISDICTION TO JURISDICTION.**

### Jurisdiction

All of our rights, duties, and obligations are subject to the courts of the country in which you acquired the Machine.

## Part 2 - Country-unique Terms

### AMERICAS

**ARGENTINA**

**Governing Law:** *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Ordinary Commercial Court of the city of Buenos Aires.

**BRAZIL**

**Governing Law:** *The following is added after the first sentence:*
Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the court of Rio de Janeiro, RJ.

**PERU**

**Limitation of Liability:** *The following is added at the end of this section:*

In accordance with Article 1328 of the Peruvian Civil Code the limitations and exclusions specified in this section will not apply to damages caused by IBM's willful misconduct ("dolo") or gross negligence ("culpa inexcusable").

### NORTH AMERICA

**How to Obtain Warranty Service:** *The following is added to this Section:*
To obtain warranty service from IBM in Canada or the United States, call 1-800-IBM-SERV (426-7378).

**CANADA**

**Limitation of Liability:** *The following replaces item 1 of this section:*

1.  damages for bodily injury (including death) or physical harm to real property and tangible personal property caused by IBM's negligence; and

**Governing Law:** *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws in the Province of Ontario.

## UNITED STATES

**Governing Law:** *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of the State of New York.

## ASIA PACIFIC

## AUSTRALIA

**What this Warranty Covers:** *The following paragraph is added to this section:*
The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other similar legislation and are only limited to the extent permitted by the applicable legislation.

**Limitation of Liability:** *The following is added to this section:*
Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974 or other similar legislation, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

**Governing Law:** *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of the State or Territory.

## CAMBODIA, LAOS, AND VIETNAM

**Governing Law:** *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of the State of New York, United States of America.

## CAMBODIA, INDONESIA, LAOS, AND VIETNAM

**Arbitration:** *The following is added under this heading:*
Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Singapore in accordance with the Arbitration Rules of Singapore International Arbitration Center ("SIAC Rules") then in effect. The arbitration award shall be final and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the SIAC. Other vacancies shall

be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

**HONG KONG S.A.R. OF CHINA AND MACAU S.A.R. OF CHINA**

**Governing Law:** *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*
laws of Hong Kong Special Administrative Region of China.

**INDIA**

**Limitation of Liability:** *The following replaces items 1 and 2 of this section:*
1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence; and
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Limited Warranty, the charge paid by you for the individual Machine that is the subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

**Arbitration:** *The following is added under this heading:*

Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Bangalore, India in accordance with the laws of India then in effect. The arbitration award shall be final and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the Bar Council of India. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

**JAPAN**

**Governing Law:** *The following sentence is added to this section:*
Any doubts concerning this Statement of Limited Warranty will be initially resolved between us in good faith and in accordance with the principle of mutual trust.

**MALAYSIA**

**Limitation of Liability:** *The word "**SPECIAL**" in item 3 of the fifth paragraph is deleted.*

**NEW ZEALAND**

**What this Warranty Covers:** *The following paragraph is added to this section:*
The warranties specified in this section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

**Limitation of Liability:** *The following is added to this section:*
Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this section are subject to the limitations in that Act.

**PEOPLE'S REPUBLIC OF CHINA (PRC)**

**Governing Law:** *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*

laws of the State of New York, United States of America (except when local law requires otherwise).

**PHILIPPINES**

**Limitation of Liability:** *Item 3 in the fifth paragraph is replaced by the following:*

**SPECIAL (INCLUDING NOMINAL AND EXEMPLARY DAMAGES), MORAL, INCIDENTAL, OR INDIRECT DAMAGES FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; OR**

**Arbitration:** *The following is added under this heading:*

Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Metro Manila, Philippines in accordance with the laws of the Philippines then in effect. The arbitration award shall be final and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the Philippine Dispute Resolution Center, Inc. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

**SINGAPORE**

**Limitation of Liability:** *The words* "**SPECIAL**" *and* "**ECONOMIC**" *in item 3 in the fifth paragraph are deleted.*

<u>**EUROPE, MIDDLE EAST, AFRICA (EMEA)**</u>

***THE FOLLOWING TERMS APPLY TO ALL EMEA COUNTRIES:***
The terms of this Statement of Limited Warranty apply to Machines purchased from IBM or an IBM reseller.

**Hot to Obtain Warranty Service:** If you purchase a Machine in Austria, Belgium, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, Norway, Portugal, Spain, San Marino, Sweden, Switzerland, United Kingdom or Vatican State, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM, provided the Machine has been announced and made available by IBM in the country in which you wish to obtain service. If you purchased a Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchase a Machine in a Middle Eastern or African country, you may obtain warranty service for that Machine from the IBM entity within the country of purchase, if that IBM entity provides warranty service in that country, or from an IBM reseller, approved by IBM to perform warranty service on that Machine in that country. Warranty service in Africa is available within 50 kilometers of an IBM approved service provider. You are responsible for transportation costs for Machines located outside 50 kilometers of an IBM approved service provider.

*Add the following paragraph in* **Western Europe** *(Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Monaco, Netherlands, Norway, Portugal, Spain, San Marino, Sweden, Switzerland, United Kingdom, Vatican State):*

The warranty for Machines acquired in Western Europe shall be valid and applicable in all Western Europe countries provided the Machines have been announced and made available in such countries.

**Governing Law:**

*The phrase* "*the laws of the country in which you acquired the Machine*" *is replaced by:*

1) "the laws of Austria" **in Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, FYR Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and FR Yugoslavia;** 2)

"the laws of France" **in Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo Republic, Djibouti, Democratic Republic of Congo, Equatorial Guinea, French Guiana, French Polynesia, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Madagascar, Mali, Mauritania, Mauritius, Mayotte, Morocco, New Caledonia, Niger, Reunion, Senegal, Seychelles, Togo, Tunisia, Vanuatu, and Wallis & Futuna;** 3) "the laws of Finland" **in Estonia, Latvia, and Lithuania;** 4) "the laws of England" **in Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, the United Kingdom, West Bank/Gaza, Yemen, Zambia, and Zimbabwe;** and 5) "the laws of South Africa" **in South Africa, Namibia, Lesotho and Swaziland.**

**Jurisdiction:** *The following exceptions are added to this section:*

1) **In Austria** the choice of jurisdiction for all disputes arising out of this Statement of Limited Warranty and relating thereto, including its existence, will be the competent court of law in Vienna, Austria (Inner-City); 2) **in Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, West Bank/Gaza, Yemen, Zambia, and Zimbabwe** all disputes arising out of this Statement of Limited Warranty or related to its execution, including summary proceedings, will be submitted to the exclusive jurisdiction of the English courts; 3) in **Belgium** and **Luxembourg**, all disputes arising out of this Statement of Limited Warranty or related to its interpretation or its execution, the law, and the courts of the capital city, of the country of your registered office and/or commercial site location only are competent; 4) **in France, Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo Republic, Djibouti, Democratic Republic of Congo, Equatorial Guinea, French Guiana, French Polynesia, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Madagascar, Mali, Mauritania, Mauritius, Mayotte, Morocco, New Caledonia, Niger, Reunion, Senegal, Seychelles, Togo, Tunisia, Vanuatu, and Wallis & Futuna** all disputes arising out of this Statement of Limited Warranty or related to its violation or execution, including summary proceedings, will be settled exclusively by the Commercial Court of Paris; 5) **in Russia**, all disputes arising out of or in relation to the interpretation, the violation, the termination, the nullity of the execution of this Statement of Limited Warranty shall be settled by Arbitration Court of Moscow; 6) **in South Africa, Namibia, Lesotho and Swaziland**, both of us agree to submit all disputes relating to this Statement of Limited Warranty to the jurisdiction of the High Court in Johannesburg; 7) **in Turkey** all disputes arising out of or in connection with this Statement of Limited Warranty shall be resolved by the Istanbul Central (Sultanahmet) Courts and Execution Directorates of Istanbul, the Republic of Turkey; 8) in each of the following specified countries, any legal claim arising out of this Statement of Limited Warranty will be brought before, and settled exclusively by, the competent court of a) Athens for **Greece**, b) Tel Aviv-Jaffa for **Israel**, c) Milan for **Italy**, d) Lisbon for **Portugal**, and e) Madrid for **Spain**; and 9) **in the United Kingdom**, both of us agree to submit all disputes relating to this Statement of Limited Warranty to the jurisdiction of the English courts.

**Arbitration:** *The following is added under this heading:*

**In Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, FYR Macedonia, Moldova,**

**Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and FR Yugoslavia** all disputes arising out of this Statement of Limited Warranty or related to its violation, termination or nullity will be finally settled under the Rules of Arbitration and Conciliation of the International Arbitral Center of the Federal Economic Chamber in Vienna (Vienna Rules) by three arbitrators appointed in accordance with these rules. The arbitration will be held in Vienna, Austria, and the official language of the proceedings will be English. The decision of the arbitrators will be final and binding upon both parties. Therefore, pursuant to paragraph 598 (2) of the Austrian Code of Civil Procedure, the parties expressly waive the application of paragraph 595 (1) figure 7 of the Code. IBM may, however, institute proceedings in a competent court in the country of installation.

**In Estonia, Latvia and Lithuania** all disputes arising in connection with this Statement of Limited Warranty will be finally settled in arbitration that will be held in Helsinki, Finland in accordance with the arbitration laws of Finland then in effect. Each party will appoint one arbitrator. The arbitrators will then jointly appoint the chairman. If arbitrators cannot agree on the chairman, then the Central Chamber of Commerce in Helsinki will appoint the chairman.

**EUROPEAN UNION (EU)**

*THE FOLLOWING TERMS APPLY TO ALL EU COUNTRIES:*

Consumers have legal rights under applicable national legislation governing the sale of consumer goods. Such rights are not affected by the warranties provided in this Statement of Limited Warranty.

**How to Obtain Warranty Service:** *The following is added to this section:*

To obtain warranty service from IBM in EU countries, see the telephone listing in Part 3 - Warranty Information.

You may contact IBM at the following address:
    IBM Warranty & Service Quality Dept.
    PO Box 30
    Spango Valley
    Greenock
    Scotland PA16 0AH

**AUSTRIA, DENMARK, FINLAND, GREECE, ITALY, NETHERLANDS, PORTUGAL, SPAIN, SWEDEN AND SWITZERLAND**

**Limitation of Liability:** *The following replaces the terms of this section in its entirety:*

Except as otherwise provided by mandatory law:
1. IBM's liability for any damages and losses that may arise as a consequence of the fulfillment of its obligations under or in connection with this Statement of Limited Warranty or due to any other cause related to this Statement of Limited Warranty is limited to the compensation of only those damages and losses proved and actually arising as an immediate and direct consequence of the non-fulfillment of such obligations (if IBM is at fault) or of such cause, for a maximum amount equal to the charges you paid for the Machine. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

The above limitation shall not apply to damages for bodily injuries (including death) and damages to real property and tangible personal property for which IBM is legally liable.

2. **UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING, EVEN IF INFORMED OF THEIR POSSIBILITY: 1) LOSS OF, OR DAMAGE TO, DATA; 2) INCIDENTAL OR INDIRECT DAMAGES, OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; 3) LOST PROFITS, EVEN IF THEY ARISE AS AN IMMEDIATE CONSEQUENCE OF THE EVENT THAT GENERATED THE DAMAGES; OR 4) LOSS OF BUSINESS, REVENUE, GOODWILL, OR ANTICIPATED SAVINGS.**

**FRANCE AND BELGIUM**

**Limitation of Liability:** *The following replaces the terms of this section in its entirety:*

Except as otherwise provided by mandatory law:
1. IBM's liability for any damages and losses that may arise as a consequence of the fulfillment of its obligations under or in connection with this Statement of Limited Warranty is limited to the compensation of only those damages and losses proved and actually arising as an immediate and direct consequence of the non-fulfillment of such obligations (if IBM is at fault), for a maximum amount equal to the charges you paid for the Machine that has caused the damages. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

   The above limitation shall not apply to damages for bodily injuries (including death) and damages to real property and tangible personal property for which IBM is legally liable.

2. **UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING, EVEN IF INFORMED OF THEIR POSSIBILITY: 1) LOSS OF, OR DAMAGE TO, DATA; 2) INCIDENTAL OR INDIRECT DAMAGES, OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; 3) LOST PROFITS, EVEN IF THEY ARISE AS AN IMMEDIATE CONSEQUENCE OF THE EVENT THAT GENERATED THE DAMAGES; OR 4) LOSS OF BUSINESS, REVENUE, GOODWILL, OR ANTICIPATED SAVINGS.**

**THE FOLLOWING TERMS APPLY TO THE COUNTRY SPECIFIED:**

**AUSTRIA**

**What this Warranty Covers:** *The following replaces the first sentence of the first paragraph of this section:*
The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

*The following paragraphs are added to this section:*

The warranty period for Machines is 12 months from the date of delivery. The limitation period for consumers in action for breach of warranty is the statutory period as a minimum. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

*The second paragraph does not apply.*

**What IBM Will Do to Correct Problems:** *The following is added to this section:*

During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

**Limitation of Liability:** *The following paragraph is added to this section:*

The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

*The following sentence is added to the end of item 2:*

IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

**EGYPT**

**Limitation of Liability:** *The following replaces item 2 in this section:*
as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

*Applicability of suppliers and resellers (unchanged).*

**FRANCE**

**Limitation of Liability:** *The following replaces the second sentence of the first paragraph of this section:*
In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: (items 1 and 2 unchanged).

**GERMANY**

**What this Warranty Covers:** *The following replaces the first sentence of the first paragraph of this section:*

The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

*The following paragraphs are added to this section:*

The minimum warranty period for Machines is twelve months. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

*The second paragraph does not apply.*

**What IBM Will Do to Correct Problems:** *The following is added to this section:*

During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

**Limitation of Liability:** *The following paragraph is added to this section:*

The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

*The following sentence is added to the end of item 2:*

IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

**HUNGARY**

**Limitation of Liability:** *The following is added at the end of this section:*

The limitation and exclusion specified herein shall not apply to liability for a breach of contract damaging life, physical well-being, or health that has been caused intentionally, by gross negligence, or by a criminal act.

The parties accept the limitations of liability as valid provisions and state that the Section 314.(2) of the Hungarian Civil Code applies as the acquisition price as well as other advantages arising out of the present Statement of Limited Warranty balance this limitation of liability.

**IRELAND**

**What this Warranty Covers:** *The following is added to this section:*
Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

**Limitation of Liability:** *The following replaces the terms of this section in its entirety:*

For the purposes of this section, a "Default" means any act, statement, omission, or negligence on the part of IBM in connection with, or in relation to, the subject matter of this Statement of Limited Warranty in respect of which IBM is legally liable to you, whether in contract or tort. A number of Defaults which together result in, or contribute to, substantially the same loss or damage will be treated as one Default occurring on the date of occurrence of the last such Default.

Circumstances may arise where, because of a Default, you are entitled to recover damages from IBM.

This section sets out the extent of IBM's liability and your sole remedy.
1. IBM will accept unlimited liability for death or personal injury caused by the negligence of IBM.
2. Subject always to the **Items for Which IBM is Not Liable** below, IBM will accept unlimited liability for physical damage to your tangible property resulting from the negligence of IBM.

3. Except as provided in items 1 and 2 above, IBM's entire liability for actual damages for any one Default will not in any event exceed the greater of 1) EUR 125,000, or 2) 125% of the amount you paid for the Machine directly relating to the Default.

**Items for Which IBM is Not Liable**

Save with respect to any liability referred to in item 1 above, under no circumstances is IBM, its suppliers or resellers liable for any of the following, even if IBM or they were informed of the possibility of such losses:
1. loss of, or damage to, data;
2. special, indirect, or consequential loss; or
3. loss of profits, business, revenue, goodwill, or anticipated savings.

**SLOVAKIA**

**Limitation of Liability:** *The following is added to the end of the last paragraph:*

The limitations apply to the extent they are not prohibited under §§ 373-386 of the Slovak Commercial Code.

**SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND**

**Limitation of Liability:** *The following is added to this section:*

IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

**UNITED KINGDOM**

**Limitation of Liability:** *The following replaces the terms of this section in its entirety:*

For the purposes of this section, a "Default" means any act, statement, omission, or negligence on the part of IBM in connection with, or in relation to, the subject matter of this Statement of Limited Warranty in respect of which IBM is legally liable to you, whether in contract or tort. A number of Defaults which together result in, or contribute to, substantially the same loss or damage will be treated as one Default.

Circumstances may arise where, because of a Default, you are entitled to recover damages from IBM.

This section sets out the extent of IBM's liability and your sole remedy.
1. IBM will accept unlimited liability for:
    a. death or personal injury caused by the negligence of IBM; and
    b. any breach of its obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982, or any statutory modification or re-enactment of either such Section.
2. IBM will accept unlimited liability, subject always to the **Items for Which IBM is Not Liable** below, for physical damage to your tangible property resulting from the negligence of IBM.
3. IBM's entire liability for actual damages for any one Default will not in any event, except as provided in items 1 and 2 above, exceed the greater of 1) Pounds

Sterling 75,000, or 2) 125% of the total purchase price payable or the charges for the Machine directly relating to the Default.

These limits also apply to IBM's suppliers and resellers. They state the maximum for which IBM and such suppliers and resellers are collectively responsible.

**Items for Which IBM is Not Liable**

Save with respect to any liability referred to in item 1 above, under no circumstances is IBM or any of its suppliers or resellers liable for any of the following, even if IBM or they were informed of the possibility of such losses:
1. loss of, or damage to, data;
2. special, indirect, or consequential loss; or
3. loss of profits, business, revenue, goodwill, or anticipated savings.

# Part 3 - Warranty Information

This Part 3 provides information regarding the warranty applicable to your Machine, including the warranty period and type of warranty service IBM provides.

**Warranty Period**

The warranty period may vary by country or region and is specified in the table below.

**Note:** "Region" means either Hong Kong or Macau Special Administrative Region of China.

**Machine - IBM** @server **xSeries 365 Type 8861**

| Country or Region of Purchase | Warranty Period | Type of Warranty Service* |
|---|---|---|
| Worldwide | 1 year | 1 and 2 |
| * See "Types of Warranty Service" for the legend and explanations of warranty-service types. | | |

**Machine - IBM** @server **xSeries 365 Type 8862**

| Country or Region of Purchase | Warranty Period | Type of Warranty Service* |
|---|---|---|
| Worldwide | 3 years | 1 and 2 |
| * See "Types of Warranty Service" for the legend and explanations of warranty-service types. | | |

A warranty period of 3 years on parts and 1 year on labor means that IBM provides warranty service without charge for:
1. parts and labor during the first year of the warranty period; and
2. parts only, on an exchange basis, in the second and third years of the warranty period. IBM will charge you for any labor provided in performance of the repair or replacement(s) in the second and third year of the warranty period.

**Types of Warranty Service**

If required, IBM provides repair or exchange service depending on the type of warranty service specified for your Machine in the above table and as described below. Warranty service may be provided by your reseller if approved by IBM to

perform warranty service. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations, additional charges may apply outside IBM's normal service area, contact your local IBM representative or your reseller for country and location specific information.

1. **Customer Replaceable Unit ("CRU") Service**

   IBM will ship CRU parts to you for your replacement. If IBM instructs you to return the replaced CRU, you are responsible for returning it to IBM in accordance with IBM's instructions. If you do not return the defective CRU, if IBM so instructs, within 30 days of your receipt of the replacement CRU, IBM may charge you for the replacement.

2. **On-site Service**

   IBM or your reseller will either repair or exchange the failing Machine at your location and verify its operation. You must provide suitable working area to allow disassembly and reassembly of the IBM Machine. The area must be clean, well lit and suitable for the purpose. **For some Machines, certain repairs may require sending the Machine to an IBM service center.**

3. **Courier or Depot Service\***

   You will disconnect the failing Machine for collection arranged by IBM. IBM will provide you with a shipping container for you to return your Machine to a designated service center. A courier will pick up your Machine and deliver it to the designated service center. Following its repair or exchange, IBM will arrange the return delivery of the Machine to your location. You are responsible for its installation and verification.

4. **Customer Carry-In or Mail-In Service**

   You will deliver or mail as IBM specifies (prepaid unless IBM specifies otherwise) the failing Machine suitably packaged to a location IBM designates. After IBM has repaired or exchanged the Machine, IBM will make it available for your collection or, for Mail-in Service, IBM will return it to you at IBM's expense, unless IBM specifies otherwise. You are responsible for the subsequent installation and verification of the Machine.

\* This type of service is called ThinkPad® EasyServ or EasyServ in some countries.

The IBM Machine Warranty World Wide Web site at http://www.ibm.com/servers/support/machine_warranties/ provides a worldwide overview of IBM Limited Warranty for Machines, a Glossary of IBM definitions, Frequently Asked Questions (FAQs) and Support by Product (Machine) with links to Product Support pages. **The IBM Statement of Limited Warranty is also available on this site in 29 languages.**

To obtain warranty service contact IBM or your IBM reseller. In Canada or the United States, call 1-800-IBM-SERV (426-7378). In the EU countries, see the telephone numbers below.

**EU Country Telephone List**

Phone numbers are subject to change without notice.

| | |
|---|---|
| Austria -- 43-1-24592-5901 | Italy -- 39-02-482-9202 |
| Belgium -- 02-718-4339 | Luxembourg -- 352-360385-1 |
| Denmark -- 4520-8200 | Netherlands -- 020-514-5770 |
| Finland -- 358-9-4591 | Portugal -- 351-21-7915-147 |

| France -- 0238-557-450 | Spain -- 34-91-662-4916 |
|---|---|
| Germany -- 07032-15-4920 | Sweden -- 46-8-477-4420 |
| Greece -- 30-210-688-1220 | United Kingdom -- 01475-555-055 |
| Ireland -- 353-1-815-4000 | |

# Appendix C. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

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

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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.

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

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

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

## Industry Canada Class A emission compliance statement

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

**Avis de conformité à la réglementation d'Industrie Canada**

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

## Australia and New Zealand Class A statement

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

## United Kingdom telecommunications safety requirement

**Notice to Customers**

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

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求採取某些適當的對策。

## Chinese Class A warning statement

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

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For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 14 AWG, Type SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

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

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| 15 A/250 V ac | 12J5128 | Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea |
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| 15 A/250 V ac | 49P2114 | Brazil |
| 15 A/250 V ac | 49P2082 | India |
| 15 A/250 V ac | 36L8884 | Argentina, Paraguay, Uruguay |
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