

xSeries 306 Type 1878, 8489 and 8836



Hardware Maintenance Manual and Troubleshooting Guide

xSeries 306 Type 1878, 8489 and 8836



Hardware Maintenance Manual and Troubleshooting Guide

Note

The most recent version of this document is available at <http://www.ibm.com/pc/support>.

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About this manual

This manual contains diagnostic information, a Symptom-to-FRU index, service information, error codes, error messages, and configuration information for the IBM xSeries 306.

Important: The field replaceable unit (FRU) procedures are intended for trained servicers who are familiar with IBM xSeries products. See the parts listing in to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU.

The latest version of this publication is available from the IBM Web site. Go to <http://www.ibm.com/>, and click **Support & downloads**. In the Technical support keyword search field, type 8836 or 1878, and click **Go**. A list of publications for the xSeries 306 server is displayed.

Important safety information

Be sure to read all caution and danger statements in this book before performing any of the instructions. See Appendix B, "Safety information," on page 83.

Leia todas as instruções de cuidado e perigo antes de executar qualquer operação.

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」。

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Accertarsi di leggere tutti gli avvisi di attenzione e di pericolo prima di effettuare qualsiasi operazione.

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.

Lea atentamente todas las declaraciones de precaución y peligro ante de llevar a cabo cualquier operación.

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

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

Online support

You can download the most current diagnostic, BIOS flash, and device driver files from <http://www.ibm.com/support> on the World Wide Web.

Contents

About this manual	iii
Important safety information	iii
Online support	iv
Chapter 1. General information.	1
Related publications	1
Notices and statements used in this book	2
Features and specifications	3
What the xSeries 306 server offers	4
Reliability, availability, and serviceability features	5
IBM Director	5
The UpdateXpress program	6
Server controls, LEDs, and power	7
Front view	7
Rear view	8
Server power features.	8
Chapter 2. Configuring the xSeries 306 server	11
Using the ServerGuide Setup and Installation CD	11
Using the Configuration/Setup Utility program.	11
Using the Adaptec HostRAID configuration programs	12
Using the Adaptec RAID Configuration Utility programs (for Serial ATA HostRAID).	12
Using the SCSISelect Utility program (for SCSI HostRAID).	13
Using the SCSISelect utility program (SCSI models only)	14
Configuring the Gigabit Ethernet controllers	15
Chapter 3. Diagnostics	17
General checkout	17
Diagnostic tools overview	19
Power-on self-test.	19
POST beep codes	19
POST error messages	20
Diagnostic programs and error messages	20
Text messages	20
Downloading the diagnostic program	21
Starting the diagnostic programs and viewing the test log	21
Diagnostic error message tables	22
Error charts	22
Small computer system interface (SCSI) messages (some models)	22
Error LEDs	23
Updating BIOS code	23
Erasing a lost or forgotten password (clearing CMOS memory)	25
Updating the UUID	26
Updating the DMI/SMBIOS data	26
Power checkout	26
Chapter 4. Installing options	27
Installation guidelines	27
System reliability guidelines	27
Handling static-sensitive devices	27
Major components of the xSeries 306 Type 1878, 8489 and 8836	28
System-board internal connectors	29

System-board switches and jumpers	29
System-board external connectors	30
System-board LEDs	30
System-board option connectors	31
Removing the cover	32
Installing an adapter	32
Installing a hard disk drive	34
Installing a simple swap Serial ATA hard disk drive	35
Installing a SCSI hard disk drive	36
Installing a memory module	37
Replacing a fan assembly	38
Replacing the battery	39
Completing the installation	41
Installing the cover	41
Connecting the cables	41
Updating the server configuration	42
Input/output ports and connectors	43
Auxiliary-device connector	43
Ethernet connectors	44
Keyboard connector	44
Serial connector	44
Universal Serial Bus connectors	44
Video connector	44
Chapter 5. Service replaceable units	45
Removing and replacing a microprocessor	45
Removing and replacing the retention module	46
Removing and replacing the system board	46
Removing and replacing the switch/LED/USB card	48
Removing and replacing a power supply	49
Removing and replacing the PCI riser card	50
Removing and replacing the fans	51
Removing and replacing the air baffle	52
Chapter 6. Symptom-to-FRU index	53
Beep symptoms	53
No-beep symptoms	55
POST error codes	55
Diagnostic error codes	58
System board LED errors	61
Error symptoms	62
Service processor error codes	68
ServeRAID error codes	68
POST (ISPR) error procedures	69
SCSI error codes	72
ServerGuide problems	72
Undetermined problems	73
Problem determination tips	74
Chapter 7. Parts listing xSeries 306 Type 1878, 8489 and 8836	75
Server	76
Keyboard CRUs	77
Power cords	78
Appendix A. Getting help and technical assistance	81
Before you call	81

Using the documentation	81
Getting help and information from the World Wide Web	82
Software service and support	82
Hardware service and support	82
Appendix B. Safety information	83
General safety	83
Electrical safety.	84
Safety inspection guide	85
Handling electrostatic discharge-sensitive devices	86
Grounding requirements	86
Safety notices (multi-lingual translations)	87
Notices	121
Edition notice	121
Trademarks.	122
Important notes	122
Product recycling and disposal	123
Battery return program	123
Electronic emission notices	124
Federal Communications Commission (FCC) statement	124
Industry Canada Class A emission compliance statement	124
Australia and New Zealand Class A statement	124
United Kingdom telecommunications safety requirement	124
European Union EMC Directive conformance statement	125
Taiwanese Class A warning statement	125
Chinese Class A warning statement.	125
Japanese Voluntary Control Council for Interference (VCCI) statement	125
Power cords	126
Index	129

Chapter 1. General information

The IBM® xSeries® 306 Type 1878, 8489 and 8836 servers are ideally suited for networking environments that require superior microprocessor performance, efficient memory management, flexibility, and large amounts of reliable data storage.

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 the warranty appendix in the *Installation Guide*.

Your server contains IBM Enterprise X-Architecture™ technologies, which help increase performance and reliability. For more information, see “What the xSeries 306 server offers” on page 4 and “Reliability, availability, and serviceability features” 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 81.

Related publications

This *Hardware Maintenance Manual and Troubleshooting Guide* is provided in PDF on the IBM xSeries Documentation CD. It contains information to help you solve the problem yourself or to provide useful information to a service technician.

In addition to this *Hardware Maintenance Manual and Troubleshooting Guide*, the following xSeries 306 Type 1878, 8489 and 8836 documentation comes with your server:

- *Installation Guide*

This printed document contains instructions for setting up the xSeries 306 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 the xSeries 306 server supports.

- *Rack Installation Instructions*

This printed document contains instructions for installing the xSeries 306 server in a rack.

- *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.

- *User's Guide*

This document is in PDF on the IBM *xSeries Documentation* CD. It contains general information about your server, including information about how to configure the xSeries 306 server, how to use the *ServerGuide™ Setup and Installation* CD, and how to get help.

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

The xSeries 306 server might have features that are not described in the documentation that came 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/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 306**.
5. Click **Continue**.

Notices and statements used in this book

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 the xSeries 306 server. Depending on your server model, some features might not be available, or some specifications might not apply.

Table 1. Features and specifications

<p>Microprocessor:</p> <ul style="list-style-type: none"> One Intel™ Pentium® 4 1024 KB (minimum) Level-2 cache and MMX™ (MMX2) technology <p>Note: Use the Configuration/Setup Utility program to determine the type and speed of the microprocessor in your server.</p> <p>Memory:</p> <ul style="list-style-type: none"> Minimum: 512 MB Maximum: 4 GB Type: PC2700/3200, 266 MHz, ECC, SDRAM, registered DIMMs only Slots: Four dual inline <p>Drives:</p> <ul style="list-style-type: none"> Diskette: 1.44 MB CD-ROM: IDE <p>Expansion bays:</p> <ul style="list-style-type: none"> Two 3.5-inch slim-high bays for hard disk drives <p>Expansion slots:</p> <ul style="list-style-type: none"> Two 66 MHz/64-bit PCI-X slots (one low profile half-length, one full-height three-quarter-length) <p>Video controller:</p> <ul style="list-style-type: none"> ATI Radeon 7000M IGP video on system board Compatible with SVGA and VGA 16 MB DDR-SDRAM video memory <p>Power supply:</p> <ul style="list-style-type: none"> 300 watt (110 or 220 V ac auto-sensing) 	<p>Size:</p> <ul style="list-style-type: none"> Height: 43 mm (1.75 inches, 1 U) Depth: 508 mm (20 inches) Width: 430 mm (16.69 inches) Maximum weight: 12.7 kg (28 lb) depending on your configuration <p>Integrated functions:</p> <ul style="list-style-type: none"> Two 1000Base-T, 100Base-T, 10Base-T (dual) Ethernet controllers on the system board with Wake on LAN® support Serial port Four USB ports (two on front and two on rear of server) Keyboard port Mouse port <p>Hard disk controller</p> <ul style="list-style-type: none"> Simple swap Serial ATA controller with integrated RAID Ultra320 SCSI controller with integrated RAID (SCSI models) <p>Acoustical noise emissions:</p> <ul style="list-style-type: none"> Sound power, idling: 6.5 bel maximum Sound power, operating: 6.5 bel maximum <p>Environment:</p> <ul style="list-style-type: none"> Air temperature: <ul style="list-style-type: none"> Server on: 10° to 35°C (50.0° to 95.0°F); altitude: 0 to 914 m (2998.7 ft) Server off: -40° to 60°C (-104° to 140°F); maximum altitude: 2133 m (6998.0 ft) Humidity: <ul style="list-style-type: none"> Server on: 8% to 80% Server off: 8% to 80% 	<p>Heat output:</p> <p>Approximate heat output in British thermal units (Btu) per hour:</p> <ul style="list-style-type: none"> Minimum configuration: 307 Btu (90 watts) Maximum configuration: 850 Btu (250 watts) <p>Electrical input:</p> <ul style="list-style-type: none"> Sine-wave input (47-63 Hz) required Input voltage low range: <ul style="list-style-type: none"> Minimum: 100 V ac Maximum: 127 V ac Input voltage high range: <ul style="list-style-type: none"> Minimum: 200 V ac Maximum: 240 V ac Input kilovolt-amperes (kVA), approximately: <ul style="list-style-type: none"> Minimum: 0.20 kVA Maximum: 0.45 kVA <p>Notes:</p> <ol style="list-style-type: none"> Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use. These levels were measured in controlled acoustical environments according to the procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779 and are reported in accordance with ISO 9296. Actual sound-pressure levels in a given location might exceed the average values stated because of room reflections and other nearby noise sources. The declared sound-power levels indicate an upper limit, below which a large number of computers will operate.
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What the xSeries 306 server offers

Your server uses the following features and technologies:

- **IBM Director**

IBM Director is a workgroup-hardware-management tool that you can use to centrally manage xSeries servers. For more information about IBM Director, see the IBM Director *User's Guide* on the IBM *xSeries Documentation CD*.

- **IBM Enterprise X-Architecture technology**

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

- **Large system-memory capacity**

The memory bus supports up to 4 GB of system memory. The memory controller supports error correcting code (ECC) for up to four industry-standard PC2100/2700/3200, 266 megahertz (MHz), 2.5 V, 184-pin, registered, double-data-rate (DDR), synchronous dynamic random access memory (SDRAM) dual inline memory modules (DIMMs).

- **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 11.

- **Integrated network support**

The xSeries 306 server comes with an integrated Intel® Gigabit Ethernet controller, which supports connection to a 10-Mbps, 100-Mbps, or 1000-Mbps network. For more information, see “Configuring the Gigabit Ethernet controllers” on page 15.

- **Large data-storage capacity**

The xSeries 306 server supports up to two 25.4-mm (1-inch) slim-high, 3.5-inch hard disk drives (serial advanced technology attachment (ATA) or SCSI, depending on server model).

- **ServeRAID™ support**

The xSeries 306 server supports ServeRAID adapters to create redundant array of independent disks (RAID) configurations.

Reliability, availability, and serviceability features

Three important computer design features are reliability, availability, and serviceability (RAS). The RAS features help to ensure the integrity of the data that is stored in the xSeries 306 server, the availability of the server when you need it, and the ease with which you can diagnose and repair problems.

The xSeries 306 server has the following RAS features:

- AIC 7901 built-in self-test (BIST)
- Advanced Configuration and Power Interface (ACPI)
- Advanced Desktop Management Interface (DMI) features
- Automatic error retry or recovery
- Automatic restart after power failure
- Auto-restart initial program load (IPL) power supply
- Boot-block recovery
- Built-in, menu-driven configuration and setup programs
- Cooling fans with speed-sensing capability
- Customer-upgradeable basic input/output system (BIOS) code
- ECC memory
- Error codes and messages
- Failover Ethernet support
- Menu-driven diagnostic programs on CD
- Microprocessor serial number access
- Monitoring support for temperature, voltage, and fan speed
- Parity checking on the SCSI bus and PCI bus
- Power-on self-test (POST)
- Read-only memory (ROM) checksums
- SDRAM with serial presence detect (SPD)
- Server management
- Standby voltage for system management features and monitoring
- System error log (with an optional Remote Supervisor Adapter installed)
- Vital product data (VPD); includes information stored in nonvolatile memory for easier remote viewing
- Wake on LAN and Alert Standard Format (ASF)

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/support/site.wss/document.do?Indocid=MIGR-61788>. It is updated every 6 to 8 weeks.
- Support for IBM and non-IBM servers, desktop computers, workstations, and mobile computers
- Support for system-management industry standards
- Integration into leading workgroup and enterprise system-management environments
- Ease of use, training, and setup

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

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

For more information about IBM Director, see the *IBM Director* CD that comes with your server, the IBM Director documentation on the CD, and the following Web pages:

IBM xSeries Systems Management page

http://www-1.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 UpdateXpress program

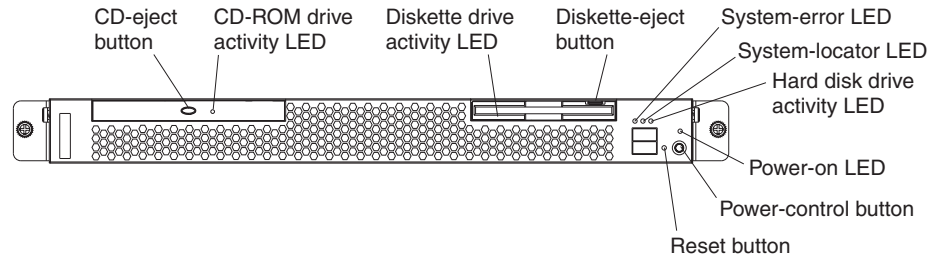
The UpdateXpress program is available for most xSeries servers and server options. It detects supported and installed device drivers and firmware in the xSeries 306 server and installs available updates. You can download the UpdateXpress program from the Web at no additional cost, or you can purchase it on a CD. To download the program or purchase the CD, go to http://www.ibm.com/servers/eserver/xseries/systems_management/ibm_director/extensions/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 and LEDs on the front of the server.



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

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

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

Diskette-eject button: Press this button to release a diskette from the diskette drive.

System-error LED: When this LED is lit, it indicates that a system error has occurred.

System-locator LED: Use this blue LED to visually locate the server if it is in a location with numerous other servers. If your server supports IBM Director, you can use IBM Director to light this LED remotely.

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

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.

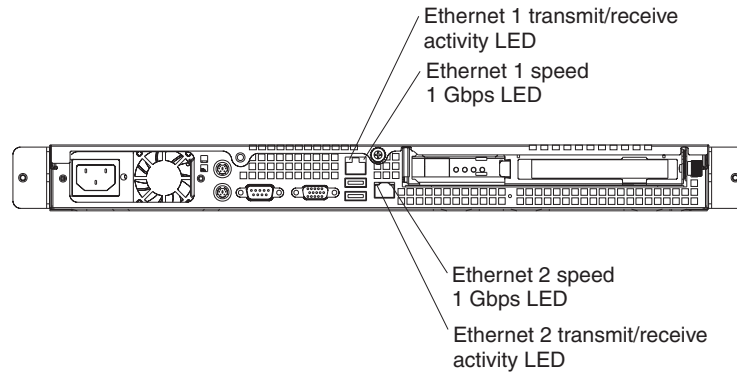
If this LED is off, it does not mean that there is no electrical power in the server. The LED might be burned out. To remove all electrical power from the server, you must disconnect the power cord from the electrical outlet.

Power-control button: Press this button to turn the server on and off manually.

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.

Rear view

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



Ethernet 1 transmit/receive activity LED: This LED is on the Ethernet connector. When this LED is lit, it indicates that there is activity between the server and the network.

Ethernet 1 speed 1 Gbps LED: This LED is on the Ethernet connector. When this LED is lit, it indicates that the Ethernet network speed is 1 Gbps. When this LED is off, it indicates that the Ethernet network speed is 10 Mbps or 100 Mbps.

Ethernet 2 speed 1 Gbps LED: This LED is on the Ethernet connector. When this LED is lit, it indicates that the Ethernet network speed is 1 Gbps. When this LED is off, it indicates that the Ethernet network speed is 10 Mbps or 100 Mbps.

Ethernet 2 transmit/receive activity LED: This LED is on the Ethernet connector. When this LED is lit, it indicates that there is activity between the server and the network.

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.
- If the server is connected to an Advanced System Management interconnect network that contains at least one server with an optional Remote Supervisor Adapter installed, the server can be turned on from the Remote Supervisor Adapter user interface.
- If your operating system supports the system-management software for an optional Remote Supervisor Adapter, the system-management software can turn on the server.
- If your operating system supports the Wake on LAN feature, the Wake on LAN feature can turn on the server.

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.

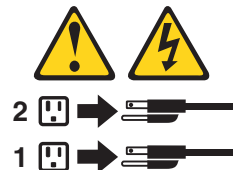
Some operating systems require an orderly shutdown before you turn off the server. See your operating-system documentation for information about shutting down the operating system.

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 4 seconds to turn off the server.
- If the server is connected to an Advanced System Management interconnect network that contains at least one server with an optional Remote Supervisor Adapter installed, the server can be turned off from the Remote Supervisor Adapter user interface.
- If an optional Remote Supervisor Adapter is installed in the server, the server can be turned off from the Remote Supervisor Adapter user interface.
- If the Wake on LAN feature turned on the server, the Wake on LAN feature can turn off the server.
- You can turn off the server through a request from the service processor.

Chapter 2. Configuring the xSeries 306 server

The *ServerGuide Setup and Installation* CD provides software setup tools and installation tools that are specifically designed for your IBM server. Use this CD during the initial installation of the server to configure basic hardware features and to simplify your operating-system installation.

In addition to the *ServerGuide Setup and Installation* CD, you can use the following configuration programs to customize the server hardware:

- Configuration/Setup Utility program
- Adaptec® HostRAID™ configuration programs
- SCSISelect utility program

For more information about these programs, see “Configuring your server” in the *User’s Guide* on the IBM *xSeries Documentation* CD.

Using the ServerGuide Setup and Installation CD

The *ServerGuide Setup and Installation* CD provides state-of-the-art programs to detect the server model and hardware options that are installed, configures the server hardware, provides device drivers, and helps you install your operating system. For information about the supported operating-system versions, see the label on the CD. If the *ServerGuide Setup and Installation* CD did not come with your server, you can download the latest version from the ServerGuide Web page at <http://www.ibm.com/pc/qtechinfo/MIGR-4ZKPPT.html>.

Complete the following steps to start the *ServerGuide Setup and Installation* CD:

1. Insert the CD, and restart the server. If the CD does not start, see “ServerGuide problems” on page 72.
2. Follow the instructions on the screen to:
 - a. Select your language.
 - b. Select your keyboard layout and country.
 - c. View the overview to learn about ServerGuide features.
 - d. View the readme file to review installation tips about your operating system and adapter.
 - e. Start the setup and hardware configuration programs.
 - f. Start the operating-system installation. You will need your operating-system CD.

Using the Configuration/Setup Utility program

The Configuration/Setup Utility program is part of the BIOS code. You can use it to:

- Change interrupt request (IRQ) settings
- Change the startup drive sequence
- Configure serial-port assignments
- Enable USB keyboard and mouse support
- Resolve configuration conflicts
- Set the date and time
- Set passwords and security settings

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

1. Turn on the server and watch the monitor screen.
2. When the message Press F1 for Configuration/Setup appears, press F1. If a supervisor (administrator) password has been set, you must type the supervisor password to access the full Configuration/Setup Utility menu.
3. Follow the instructions on the screen.

Using the Adaptec HostRAID configuration programs

Use the Adaptec RAID Configuration Utility programs and SCSISelect Utility to add RAID levels 0 and 1 functionality to the integrated Serial ATA controller and the SCSI controller. Be sure to use these programs as described in this document. Use these programs to:

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

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

- The SCSI controller with integrated SCSI RAID (SCSI models) and the integrated Serial ATA controller (SATA models) with integrated SATA RAID support RAID levels 0 and 1. Installing an optional ServeRAID controller provides additional RAID levels.
- You cannot use the *ServerGuide Setup and Installation* CD to configure the integrated Serial ATA controller with integrated RAID and the SCSI controller with integrated RAID.
- Hard disk drive capacities affect how you create arrays. Drives in an array can have different capacities, but the RAID controller treats them as if they all have the capacity of the smallest hard disk drive.
- To help ensure signal quality, do not mix drives with different speeds and data rates.
- To update the firmware and BIOS code for an optional ServeRAID controller, you must use the IBM *ServeRAID Support* CD that comes with the ServeRAID option.
- If you install a different type of RAID controller in your server, use the configuration method described in the instructions that come with that RAID controller to view or change SCSI settings for attached devices.

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

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

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

Enabling the Serial ATA HostRAID feature

Complete the following steps to enable the SATA HostRAID feature:

1. Turn on the server and watch the monitor screen.
2. When the message Press F1 for Configuration/Setup appears, press F1. If you have set a supervisor password, you are prompted to type the password.
3. Select **Devices and I/O Ports**.
4. Scroll down and select **SATA RAID Enable**.
5. Select **Enabled**.
6. Press Esc; then, select **Yes** to save your changes.

Using the Serial ATA HostRAID feature

The instructions in this section are for using the Array Configuration Utility program to access and perform an initial RAID level-1 configuration. 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 settings for the attached devices.

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

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

1. Turn on the server and watch the monitor screen.
2. When the message Press <CTRL><<A> for Adaptec RAID Configuration Utility appears, press Ctrl+A.
3. Select **Array Configuration Utility (ACU)**.
4. Select **Create Array**.
5. From the list of ready drives, select the two drives that you want to group into the array.
6. Select **RAID-1** when asked to select the RAID level.
7. (optional), Type an identifier for the array.
8. Select **Quick Int** when asked for the array build method.
9. Follow the instructions on the screen to complete the configuration, and select **Done** to exit.
10. Restart the server.

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

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

Using the SCSISelect Utility program (for SCSI HostRAID)

Use the SCSISelect Utility to add RAID levels 0 and 1 functionality to the SCSI controller (SCSI models only). This utility is part of the BIOS code in your server.

The SCSI RAID feature comes disabled by default. You must enable the SCSI RAID feature and install the device drivers before you can use it. SCSI RAID configuration utilities, device drivers, and information are available on the

ServeRAID-7e (Adaptec HostRAID) Support CD. If this CD did not come with your server, you can download the *ServeRAID-7e (Adaptec HostRAID) Support CD* from the IBM Web site at <http://www.ibm.com/pc/support/>.

Enabling the SCSI HostRAID feature

Complete the following steps to enable the SCSI HostRAID feature:

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

Using the SCSI HostRAID feature

The instructions in this section describe how to access the SCSI HostRAID feature from the SCSISelect Utility program and perform an initial RAID level-1 configuration on your server. 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 documentation on the *ServeRAID-7e (Adaptec HostRAID) Support CD* for additional information about how to use the SCSI HostRAID feature.

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

1. From the SCSISelect main menu, select **Configure/View HostRAID Settings**.
2. From the list of ready drives, type C to create an array.
3. Select **RAID-1** when asked to select the RAID type.
4. From the list of ready drives, select the two drives that you want to group into the array.
5. Select **Create new RAID-1**.
6. Type an identifier for the array.
7. Select **Yes** to create the array.
8. Press Esc to exit the utility.
9. Restart the server.

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

Using the SCSISelect utility program (SCSI models only)

Use the SCSISelect utility program to view or change SCSI controller settings and view SCSI ID assignments. The SCSISelect utility program is available on SCSI models only.

Complete the following steps to start the SCSISelect utility program:

1. Turn on the server and watch the monitor screen.

2. When the message Press <CTRL><A> for SCSISelect Utility appears, press Ctrl+A. If a supervisor password has been set, you are prompted to type the password.
3. Select the channel for which you want to change settings, and press Enter.
4. When the message Would you like to configure the SCSI controller, or run the SCSI Disk Utilities? appears, select a choice and press Enter.
5. Use the arrow keys to select a choice from the menu, and follow the instructions on the screen.

Configuring the Gigabit Ethernet controllers

The Ethernet controllers are integrated on the system board. They provide an interface for connecting to a 10-Mbps, 100-Mbps, or 1-Gbps network and provide full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the network. If the Ethernet ports in 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. For device drivers and information about configuring the Ethernet controllers, see the *Intel Ethernet Software CD* that comes with your server. For updated information about configuring the controllers, go to <http://www.ibm.com/pc/support/>.

Chapter 3. Diagnostics

This chapter provides basic troubleshooting information to help solve some common problems that might occur with the server.

If you cannot locate and correct the problem using the information in this chapter, see Appendix A, “Getting help and technical assistance,” on page 81 for more information.

General checkout

Follow the checkout procedure for diagnosing hardware problems. Review the following information before performing the checkout procedure:

- Read the safety information beginning at page 83.
- The diagnostic programs are on the *IBM Enhanced Diagnostics* CD. These programs are the primary method of testing the major components of the server: the system board, Ethernet controller, video controller, RAM, keyboard, mouse (pointing device), serial ports, hard disk drives, and parallel port. You can also use them to test some external devices. If you are not sure whether a problem is caused by the hardware or by the software, you can use the diagnostic programs to confirm that the hardware is working correctly.
- When you run the diagnostic programs, a single problem might cause several error messages. If you receive several error messages, correct the cause of the first error message. The other error messages might not occur the next time you run the diagnostic programs.
- Before running the diagnostic programs, you must determine whether the failing server is part of a shared hard disk drive cluster (two or more servers sharing external storage devices). If you suspect that it is part of a cluster, you can run all diagnostic programs except the ones that test the storage unit (that is, a hard disk drive in the storage unit) or the storage adapter that is attached to the storage unit. The failing server might be part of a cluster if any of the following conditions is true:
 - The customer identifies the failing server as part of a cluster.
 - One or more external storage units are attached to the failing server and at least one of the attached storage units is also attached to another server or unidentifiable device.
 - One or more servers are located near the failing server.
- **Important:**
 1. For servers that are part of a shared hard disk drive cluster, run one test at a time. Do not run any suite of tests, such as “quick” or “normal” tests, because this could enable the hard disk drive diagnostic tests.
 2. If more than one error code is displayed, correct the first error. The other error codes might not occur the next time you run the diagnostic programs.
 3. If the server is suspended and a POST error code is displayed, see “POST error codes” on page 55.
 4. If the server is suspended and no error message is displayed, see “Error symptoms” on page 62 and “Undetermined problems” on page 73.
 5. For information about power-supply problems, see “Power checkout” on page 26.
 6. For intermittent problems, check the error log; see “Diagnostic programs and error messages” on page 20.

Note: The system-error log is available on the xSeries 306 only when the server has an optional Remote Supervisor Adapter II.

Complete the following steps to perform the checkout procedure:

001 IS THE SERVER PART OF A CLUSTER?

YES. Schedule maintenance for the server. Shut down all servers related to the cluster. Run the storage test.

NO. Go to step **002** .

002 IF THE SERVER IS NOT PART OF A CLUSTER:

If the operating system is running, complete the following steps:

1. Check the system board for error LEDs (see “Error LEDs” on page 23).
2. If the xSeries 306 has an optional Remote Supervisor Adapter II, check the service processor system-error logs:
 - a. If the system-error log indicates a damaged field replaceable unit (FRU), replace the FRU, and run the diagnostic programs to confirm that the problem has been solved.
 - b. If the system-error log does not indicate a damaged FRU, see “Error symptoms” on page 62 and “Undetermined problems” on page 73.

If the operating system is not running, complete the following steps:

1. Check the system board for error LEDs (see “Error LEDs” on page 23).
2. If the xSeries 306 has an optional Remote Supervisor Adapter II, check the service processor system-error logs:
 - a. If the system-error log indicates a damaged field replaceable unit (FRU), replace the FRU, and run the diagnostic programs to confirm that the problem has been solved.
 - b. If the error log does not indicate a damaged FRU, check the operating-system event logs; if these logs do not specify a particular error, go to step 3.
3. Turn off the server and all external devices.
4. Check all cables and power cords.
5. Set all display controls to the middle position.
6. Turn on all external devices.
7. Turn on the server.
8. Watch the screen and the serial port for POST errors, and record any POST error messages that are displayed on the screen. If an error is displayed, look up the first error (see “POST error codes” on page 55).
9. Run the diagnostic programs (see “Starting the diagnostic programs and viewing the test log” on page 21).

003 DID THE DIAGNOSTIC PROGRAMS START ?

NO. Find the failure symptom in “Error symptoms” on page 62.

YES. Run the diagnostic programs (see “Starting the diagnostic programs and viewing the test log” on page 21).

If you receive an error, see Chapter 6, “Symptom-to-FRU index,” on page 53.

If the diagnostics were completed successfully and you still suspect a problem, see “Undetermined problems” on page 73.

If the server does not turn on, see “Error symptoms” on page 62.

Diagnostic tools overview

The following tools are available to help you diagnose and solve hardware-related problems:

- **POST beep codes and error messages**

The power-on self-test (POST) generates beep codes and messages to indicate successful test completion or the detection of a problem. See “Power-on self-test” for more information.

- **Diagnostic programs**

The diagnostic programs are stored on the *IBM Enhanced Diagnostics CD*. These programs are the primary method of testing the major components of the server. See “Diagnostic programs and error messages” on page 20 for more information.

- **Error charts**

These charts list problem symptoms and steps to correct the problem. See “Error charts” on page 22 for more information.

- **Symptom-to-FRU index**

This index lists problem symptoms and steps to correct each problem. See Chapter 6, “Symptom-to-FRU index,” on page 53 for more information.

Power-on self-test

When you turn on the server, the power on self-test (POST) performs a series of tests to check the operation of system components and some of the installed options.

If POST finishes without detecting any problems, the first window of the operating system opens or an application program appears.

If POST detects a problem, more than one beep might sound, and an error message appears on the screen.

Notes:

1. If you have a user password set, you must type the password and press Enter, when prompted, before the operating system will start.
2. A single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After you correct the cause of the first error message, the other error messages usually will be resolved the next time you run the test.

POST beep codes

POST generates beep codes to indicate successful completion or the detection of a problem.

- One short beep indicates the successful completion of POST.
- More than one beep indicates that POST detected a problem. For more information, see “Beep symptoms” on page 53.

If POST detects a problem (more than one beep sounds), an error message appears on the screen. See “Beep symptoms” on page 53 and “POST error codes” on page 55 for more information.

POST error messages

POST error messages can appear when a problem is detected during startup. For a complete list of POST messages, see “POST error codes” on page 55.

Diagnostic programs and error messages

The system diagnostic programs are on the *IBM Enhanced Diagnostics* CD. These programs are the primary method of testing the major components of the server.

An *IBM Enhanced Diagnostics* CD comes with the server. You can also download the latest version of the diagnostic programs from <http://www.ibm.com/support/> (see “Downloading the diagnostic program” on page 21).

The IBM Enhanced Diagnostic programs isolate problems from the server hardware and software. The programs run independently of the operating system and *must be run either from a CD or diskette*.

Diagnostic error messages indicate that a problem exists; they are not intended to be used to identify a failing part. Troubleshooting and servicing complex problems indicated by error messages should be performed by trained service personnel.

Sometimes the first error to occur causes additional errors. In this case, the server displays more than one error message. Always follow the suggested action instructions for the *first* error message that appears.

Error codes that might be displayed are listed at “Diagnostic error codes” on page 58.

Text messages

The diagnostic text message format is as follows:

result test_specific_string

where:

result is one of the following results:

Passed

This test was completed without any errors.

Failed

This test discovered an error.

User Aborted

You stopped the test before it was completed.

Not Applicable

You attempted to test a device that is not present in the server.

Aborted

The test could not proceed because of the server configuration.

Warning

A possible problem was reported during the test (for example, a device that was to be tested is not installed).

test specific string

is an error code or other information about the error.

Downloading the diagnostic program

Complete the following steps to download the latest image of the IBM Enhanced Diagnostics and create a startable Enhanced Diagnostics diskette:

1. Go to <http://www.ibm.com/support/>.
2. Download the diagnostics file for the server to a hard disk drive directory (not to a diskette).

Note: If you intend to create a diagnostics CD, download the file with the extension .iso.

3. Go to a DOS prompt, and change to the directory where the file was downloaded.
4. If you are creating a diagnostics diskette:
 - a. Insert a blank high-density diskette into the diskette drive.
 - b. Type in the following, and then press Enter: *filename a:* where *filename* is the name of the file you downloaded from the Web.
5. If you are creating a diagnostics CD, use a blank CD in conjunction with the software you use to create a CD.

The downloaded file is self-extracting when copied to the diskette or CD. When the copy is completed, you have a startable or bootable IBM Enhanced Diagnostics diskette or CD.

Starting the diagnostic programs and viewing the test log

The IBM Enhanced Diagnostic programs isolate problems from the server hardware and software. The programs run independently of the operating system and *must be run either from a CD or diskette*. This method of testing is generally used when other methods are not accessible or have not been successful in isolating a problem suspected to be hardware related.

The test log records data about system failures and other pertinent information. The following sections describe the diagnostic procedure for the diagnostics CD and the diagnostics diskette.

Note: The system-error log is available on the xSeries 306 server only when the server has an optional Remote Supervisor Adapter II.

Using the diagnostics CD

To start the IBM Enhanced Diagnostics using the CD, complete the following steps:

1. Turn off the server and any peripheral devices.
2. Turn on all attached devices; then, turn on the server.
3. When you see Press F1 For Configuration/Setup, press the F1 key.
4. When the Configuration/Setup Utility menu appears, select **Start Options**.
5. From the **Start Options** menu, select **Startup Sequence**.
6. Note the device that is selected as the first startup device. Later, you must restore this setting.
7. Select **CD-ROM** as the first startup device.
8. Press Esc two times to return to the Configuration/Setup Utility menu.
9. Insert the IBM *Enhanced Diagnostics* CD in the CD-ROM drive.
10. Select **Save & Exit Setup** and follow the prompts. The diagnostics will load. Follow the instructions on the screen to run the diagnostics.

11. When the tests are completed, view the test log by selecting **Utility** from the top of the screen. You can save the test log to a file on a diskette or to the hard disk.

Important: When you finish running the diagnostics and utilities, remove the CD from the CD-ROM drive and turn off the server. You must restore the first startup device to the original setting. Use steps 2 on page 21 through 8 on page 21 of this procedure to do this.

The test-log data is maintained only while the diagnostic programs are active. When you exit from the diagnostic programs, the test log is cleared. Save the test log to a file on a diskette or to the hard disk if you want to refer to it later.

Using the diagnostic diskette

Complete the following steps to start the IBM Enhanced Diagnostics using the diagnostics diskette:

1. Turn off the server and any peripheral devices.
2. Insert the IBM Enhanced Diagnostics diskette into the external USB diskette drive.
3. Turn on all attached devices; then, turn on the server.
4. Follow the instructions on the screen.
5. When the tests are completed, view the test log by selecting **Utility** from the top of the screen. You can save the test log to a file on a diskette or to the hard disk.

The test-log data is maintained only while the diagnostic programs are active. When you exit from the diagnostic programs, the test log is cleared. Save the test log to a file on a diskette or to the hard disk if you want to refer to it later.

6. When you have completed the diagnostics procedure, remove the diagnostic diskette from the diskette drive before restarting the server.

If the hardware passes the Enhanced Diagnostics but the problem persists during normal server operations, a software error might be the cause. If you suspect a software problem, refer to the information that comes with the software package.

Diagnostic error message tables

For descriptions of the error messages that might appear when you run the diagnostic programs, see “Diagnostic error codes” on page 58.

Note: Depending on the configuration, some of the error messages might not appear when you run the diagnostic programs.

Error charts

You can use the error charts to find solutions to problems that have definite symptoms (see “Error symptoms” on page 62).

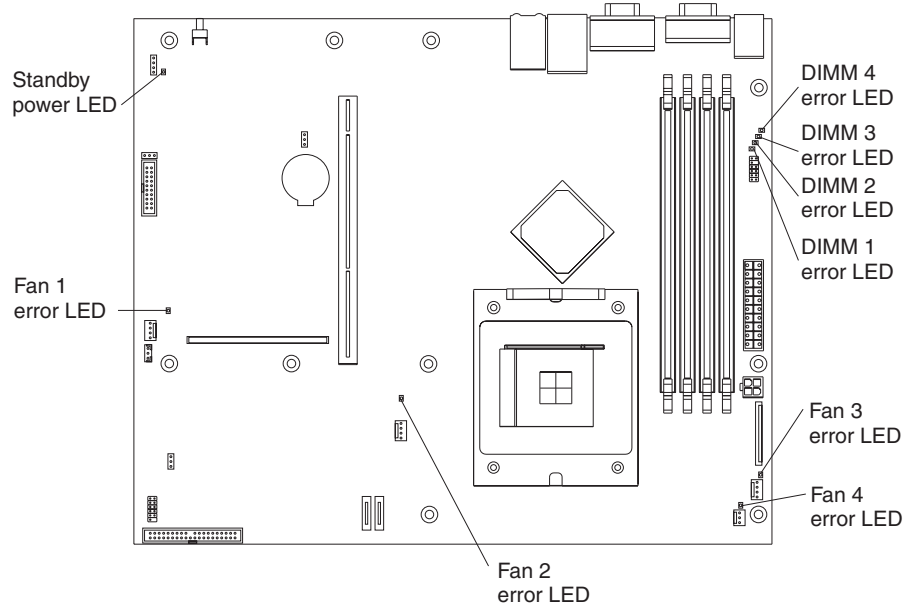
Small computer system interface (SCSI) messages (some models)

If the server has an Ultra320 SCSI adapter and you receive a SCSI error message, see “SCSI error codes” on page 72.

Note: If the server does not have a SCSI hard disk drive, ignore any message that indicates that the BIOS code is not installed.

Error LEDs

The system board has error LEDs for microprocessors, fans, and memory that will help to locate the source of the error. Run the diagnostic programs (see “Starting the diagnostic programs and viewing the test log” on page 21) to find out the cause of the error.



Each error LED is lit to indicate a problem with a specific component. After a problem is corrected, its LED will not be lit the next time the server is restarted; if the problem remains, the LED will be lit again.

Updating BIOS code

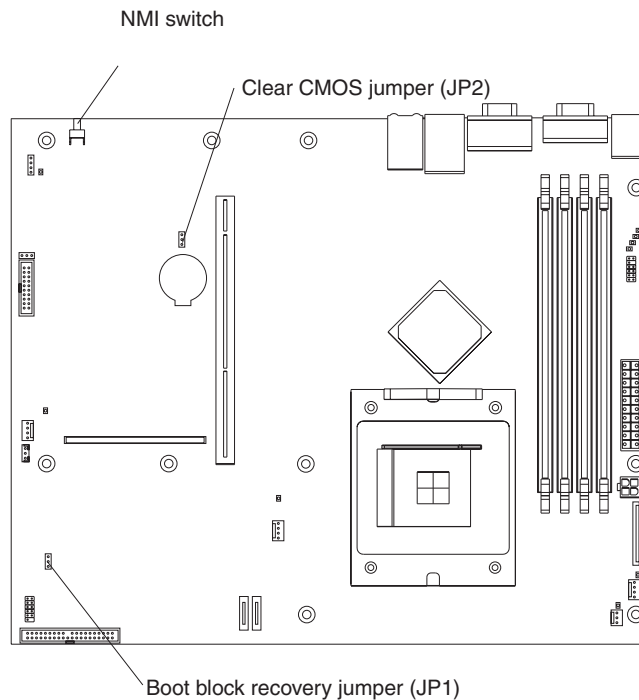
The BIOS code can be updated by using an external USB diskette drive or by using a Linux or Windows update package (if available).

The most current level of BIOS code for the server is available at <http://www.ibm.com/support/>. After you make sure that the server has the latest baseboard management controller firmware level, you can update the BIOS code for the server through one of the following methods:

- Downloading the latest BIOS code from the IBM Web site, creating an update diskette, and using an external USB diskette drive to install the BIOS code.
- Installing an update package for the Linux or Microsoft Windows operating system, if available.

If power to the server is interrupted while POST/BIOS code is being updated (flash update), the server might not restart correctly or might not display video (no video). If this happens, use the following procedure to recover:

1. Review the safety information beginning at page 83 and “Handling static-sensitive devices” on page 27.
2. Turn off the server and all attached devices.
3. Disconnect the power cord.
4. Remove the cover (see “Removing the cover” on page 32).
5. Locate the boot block recovery jumper (JP1) on the system board, removing any adapters that impede access to the jumper. The following illustration shows the location of the jumper on the system board.

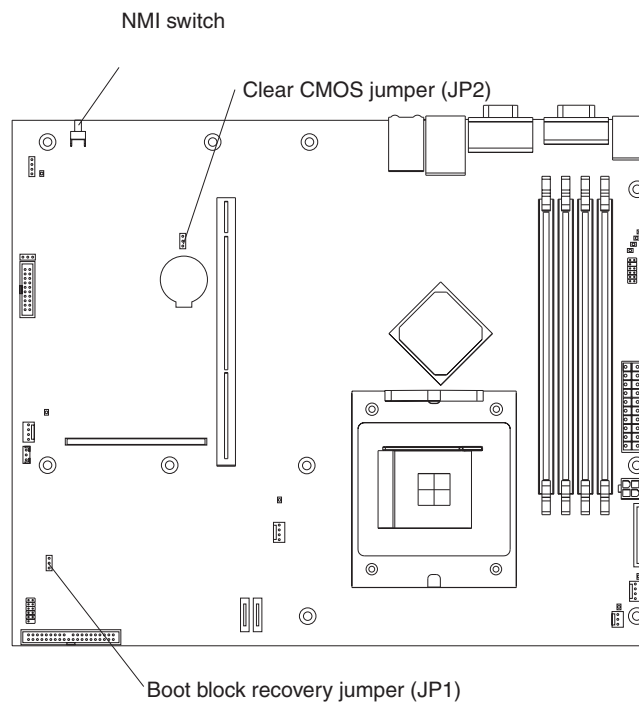


6. Remove the boot block recovery jumper from pins 1 and 2.
7. Replace any adapters that were removed; then, replace the support bracket and replace the side cover (see “Installing the cover” on page 41).
8. Connect the server to a power source, keyboard, monitor, and mouse.
9. Insert the POST/BIOS update (flash) diskette into the diskette drive. You can download a file to create this diskette from <http://www.ibm.com/support/>.
10. Turn on the server and the monitor.
11. After the update session is completed, turn off the server and monitor.
12. Remove the diskette from the diskette drive.
13. Disconnect all power cords; then, remove the server cover.
14. Return the boot block recovery jumper to pins 1 and 2.
15. Reinstall the server cover; then, reconnect all external cables and power cords and turn on the peripheral devices.
16. Turn on the server to restart the operating system.

Erasing a lost or forgotten password (clearing CMOS memory)

Complete the following steps to set the CMOS recovery jumper and erase a forgotten password:

1. Review the safety information beginning at Appendix B, “Safety information,” on page 83 and “Handling static-sensitive devices” on page 27.
2. Turn off the server and all attached devices.
3. Unplug the power cord.
4. Remove the side cover. (See “Removing the cover” on page 32.)
5. Locate the CMOS recovery jumper (JP2) on the system board, removing any adapters that impede access to the jumper. The following illustration shows the location of the jumper on the system board.



6. Move the CMOS recovery jumper from pins 1 and 2 to pins 2 and 3.
7. Wait 60 seconds; then, return the CMOS recovery jumper to pins 1 and 2
8. Replace any adapters that were removed; then, replace the support bracket, and replace the side cover. (See “Installing the cover” on page 41.)

You can now start the server one time without having to use the user password and start the Configuration/Setup Utility program. At this time, you can either delete the old password or set a new user password. If you do not change or delete the password, the next time you start the server the original user password will be reinstated.

9. Connect the server to a power source, keyboard, monitor, and mouse.
10. Turn on the server. The Configuration/Setup Utility program starts.
11. Follow the instructions to erase the existing password or create a new password.
12. Select **Save Settings**, and press Enter.

Updating the UUID

The Universal Unique Identifier (UUID) must be updated when the system board is replaced. Complete the following steps to update the UUID:

1. Copy the UUID utility (`uuid.exe`) from the BIOS flash diskette to a DOS bootable diskette.
2. Insert the diskette created in step 1 into the server.
3. Restart the server from the diskette.
4. At the `a:\` prompt, type `UUID /wr`, and press **Enter**. The utility will generate a random identifier.
5. Restart the server.

Updating the DMI/SMBIOS data

The Desktop Management Interface (DMI) must be updated when the system board is replaced. Complete the following steps to update the DMI:

1. Copy the DMI/SMBIOS utility (`extrmdmi.exe`) from the BIOS flash diskette to a DOS bootable diskette.
2. Insert the diskette created in step 1 into the server.
3. Restart the server from the diskette.
4. At the `a:\` prompt, type `extrmdmi.exe`, and press **Enter**.
5. To change the machine type and model number, type `mtm XXXXYYY` where `XXXX` is the model type and `YYY` is the model number; then, press **Enter**.
6. To change the serial number, type `sn ZZZZZZZ` where `ZZZZZZZ` is the serial number; then, press **Enter**.
7. To change the asset tag, type `asset AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA` where `AAAAAAAAAAAAAAAAAAAAAAAAAAAAA` is the asset tag number; then, press **Enter**.
8. Restart the server.

Power checkout

Power problems can be difficult to solve. For example, a short circuit can exist anywhere on any of the power distribution buses. Usually, a short circuit will cause the power subsystem to shut down because of an overcurrent condition.

A general procedure for troubleshooting power problems is as follows:

1. Turn off the server, and disconnect all ac power cords.
2. Check for loose cables in the power subsystem. Also check for short circuits, for example, if there is a loose screw causing a short circuit on a circuit board.
3. Remove adapters, and disconnect the cables and power connectors to all internal and external devices until the server is at the minimum configuration required to start the server (see "Minimum operating requirements" on page 73).
4. Reconnect all ac power cords, and turn on the server. If the server starts successfully, replace adapters and devices one at a time until the problem is isolated. If the server does not start from the minimal configuration, replace FRUs of minimal configuration one at a time until the problem is isolated.

To use this method, you must know the minimum configuration that is required for the server to start (see page 73).

Chapter 4. Installing options

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

Installation guidelines

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

- Read the safety information beginning on page 83 and the guidelines in “Handling static-sensitive devices” on page 27. This information will help you work safely with your server and options.
- Make sure that you have an adequate number of properly grounded electrical outlets for your server, monitor, and other devices that you will connect to the server.
- Back up all important data before you make changes to disk drives.
- Have a small flat-blade screwdriver available.
- You do not have to turn off the server to install or replace hot-plug Universal Serial Bus (USB) devices.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the server, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- For a list of supported options for your server, go to <http://www.ibm.com/support/>.

System reliability guidelines

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

- Each of the drive bays has a drive tray installed in it.
- There is adequate space around the server to allow the server cooling system to work properly. Leave approximately 50 mm (2.0 in.) of open space around the front and rear of the server. Do not place objects in front of the fans.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan within 48 hours.

Handling static-sensitive devices

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

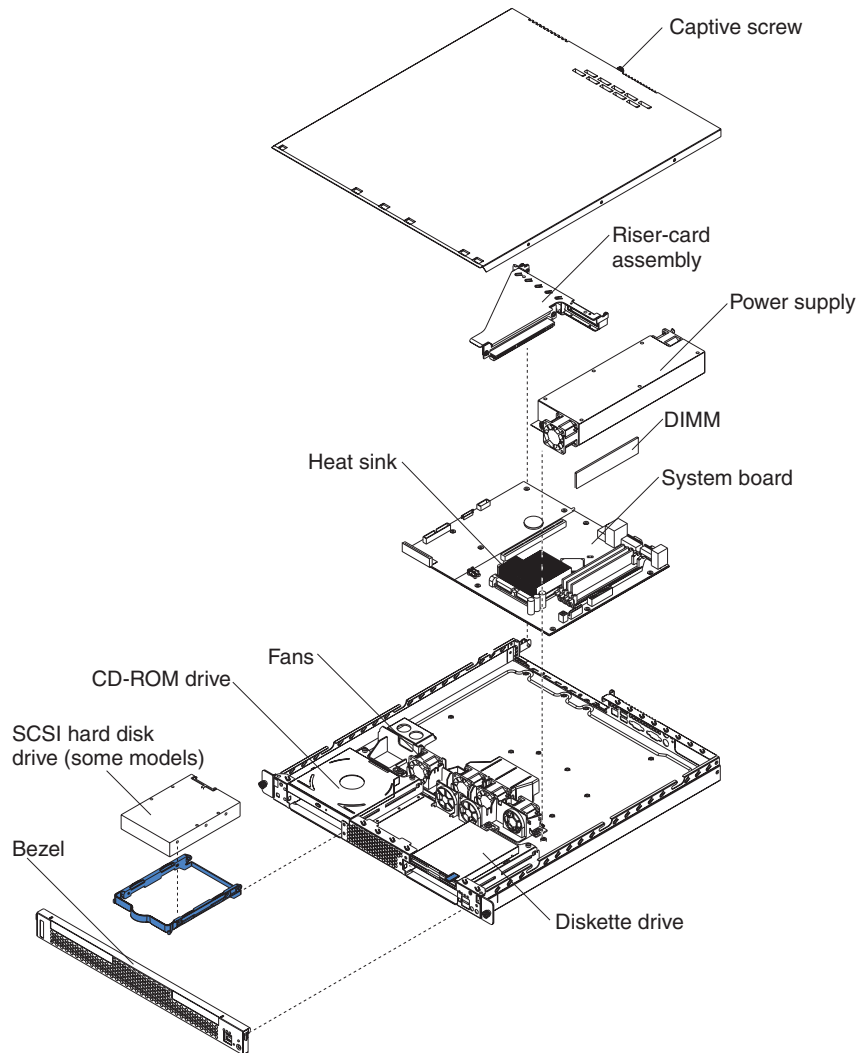
To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.

- While the device is still in its static-protective package, touch it to an unpainted metal part of the server for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the server without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on your server cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

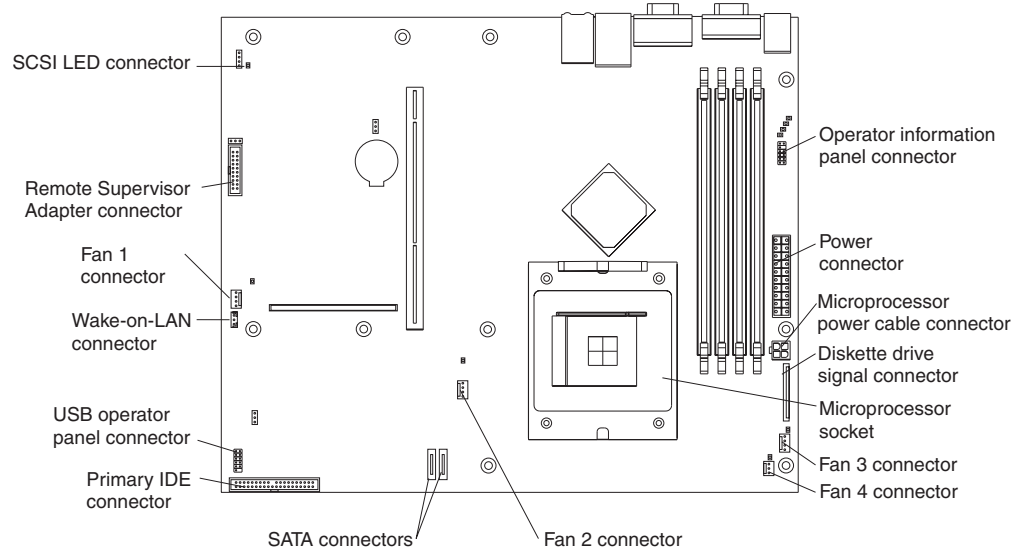
Major components of the xSeries 306 Type 1878, 8489 and 8836

The following illustration shows the major components in the server.



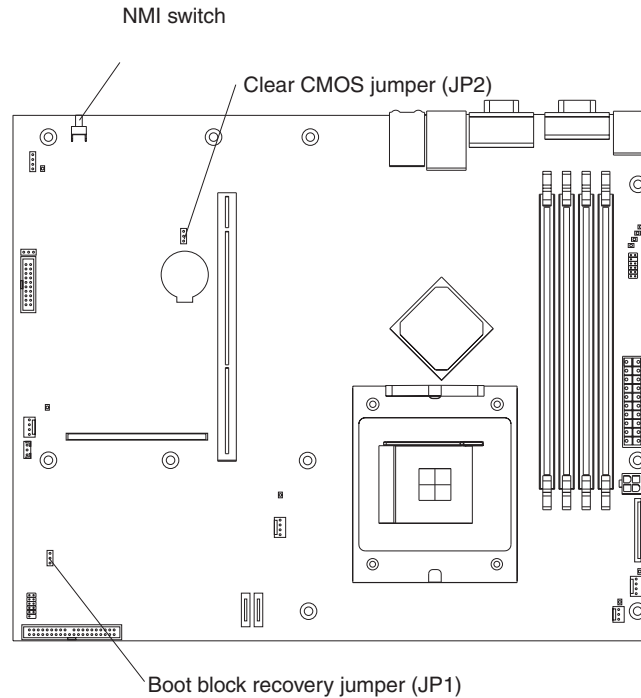
System-board internal connectors

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



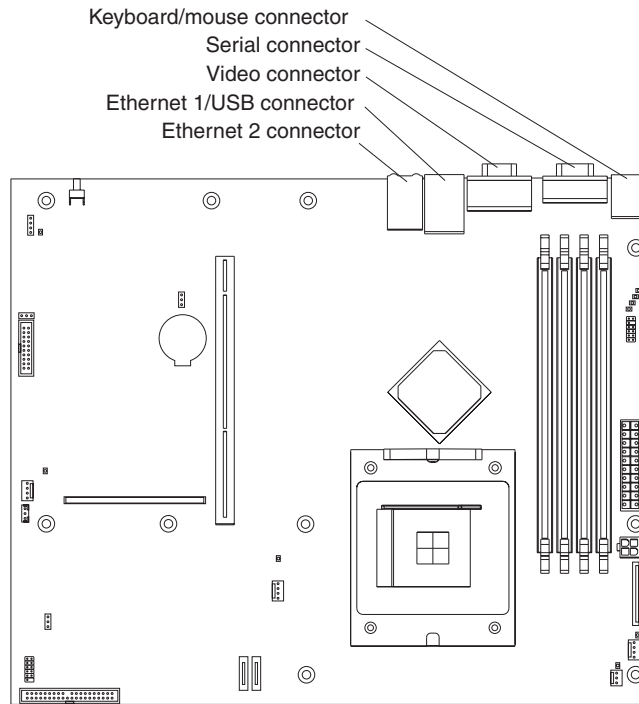
System-board switches and jumpers

The following illustration shows the switches and jumpers on the system board.



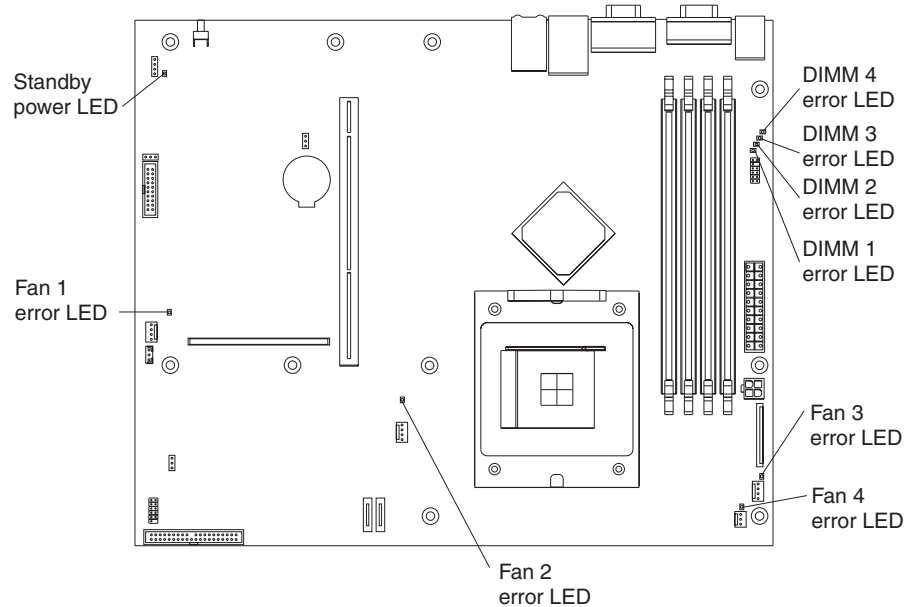
System-board external connectors

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



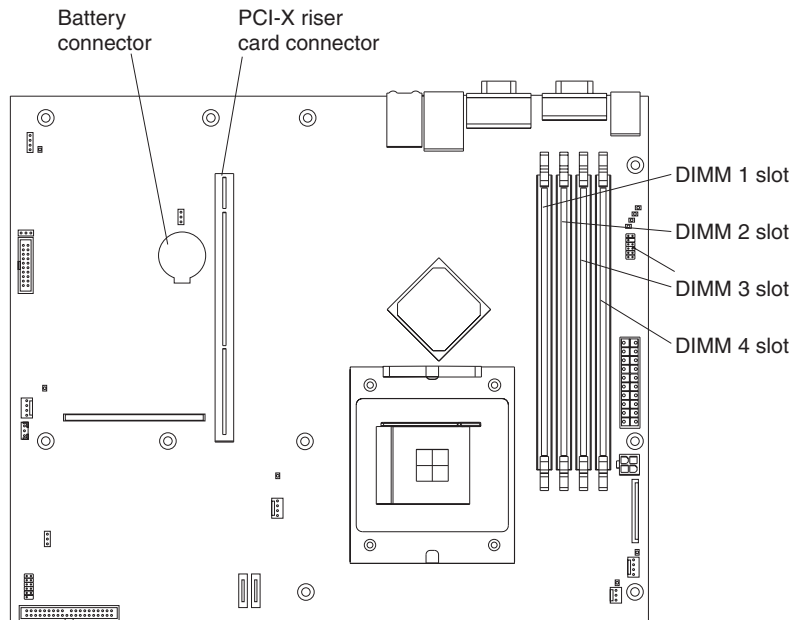
System-board LEDs

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

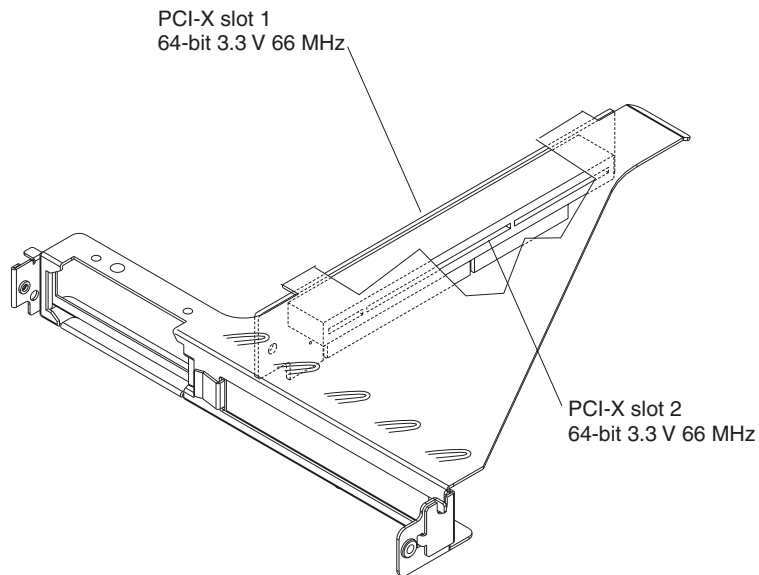


System-board option connectors

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



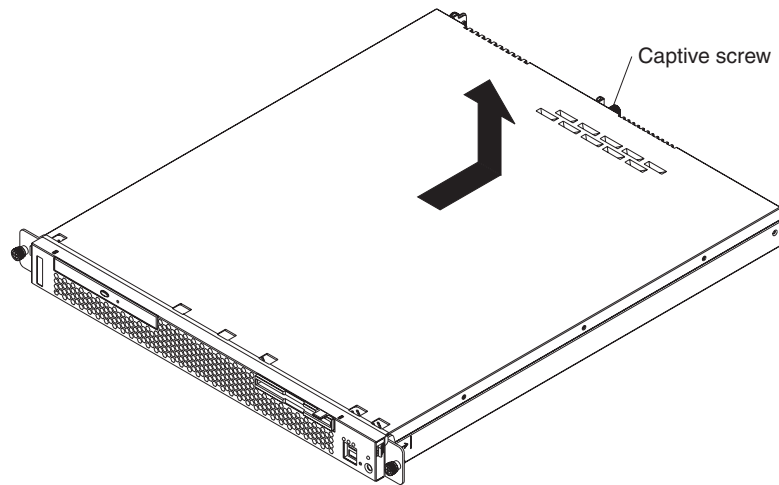
The following illustration shows the location of the PCI-X slots on the riser-card assembly.



Removing the cover

Complete the following steps to remove the cover:

1. Read the safety information beginning on page 83 and “Installation guidelines” on page 27.
2. Turn off the server and all attached devices (see “Turning off the server” on page 9).



3. Disconnect all external cables and the power cord.
4. Loosen the captive screw on the rear of the cover.
5. Slide the cover back and off the server.

Installing an adapter

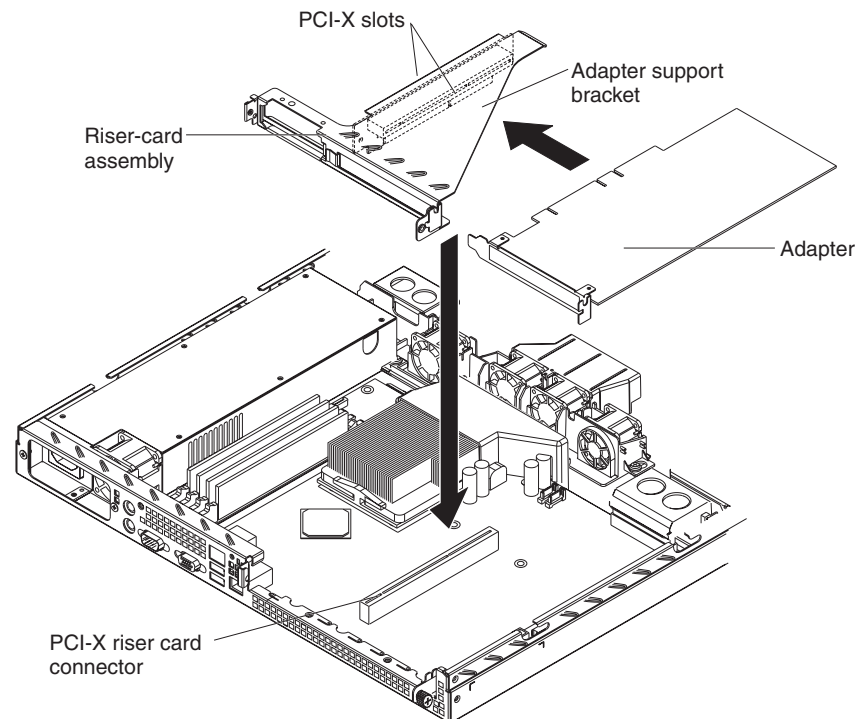
The following notes describe the types of adapters that your server supports and other information that you must consider when installing an adapter:

- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this section. If you need to change the switch settings or jumper settings on the adapter, follow the instructions that come with the adapter.
- Your server comes with two peripheral component interconnect-extended (PCI-X) adapter slots located on the riser-card assembly. You must first remove the riser-card assembly to access the PCI-X connectors.
- There are two 64-bit 66 MHz PCI-X slots.
- You can install one low profile half-length adapter in expansion slot 1 and one full-height three-quarter-length adapter in expansion slot 2.
- Your server supports 3.3 V or universal adapters.
- Your server uses a rotational interrupt technique to configure PCI-X adapters so that you can install PCI-X adapters that do not support sharing of PCI-X interrupts.
- The server scans PCI-X slots to assign system resources. If you have not changed the default startup sequence, the server starts devices in the following order: the CD-ROM and diskette drives first; then, PCI-X slot 2, PCI-X slot 1, and the integrated Ethernet controllers.
- The optional Remote Supervisor Adapter II can be installed only in PCI-X slot 2.
- You can install an optional RAID controller in your server to control the internal hard disk drives, for example, to enable you to configure the internal hard disk

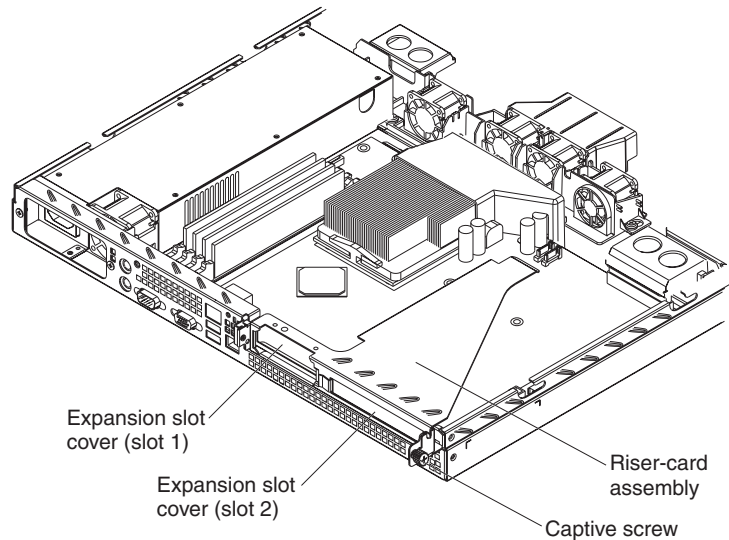
drives into disk arrays. See your RAID controller option documentation for complete instructions on installing a RAID controller in your server and for additional information on RAID controllers.

- The optional ServeRAID-7t SATA controller can be installed only in PCI-X slot 1. The low-profile bracket that comes with the controller is required to install the controller.
- The optional ServeRAID-6i+ controller can be installed only in PCI-X slot 1. The low-profile bracket that comes with the controller is required to install the controller.
- No rerouting of the internal SCSI cable (SCSI models only) is required if you are installing the ServeRAID-6i+ controller. The ServeRAID-6i+ controller uses the SCSI connector (SCSI models only) for output.

Complete the following steps to install an adapter.



1. Read the safety information beginning on page 83 and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables. Remove the cover (see “Removing the cover” on page 32).
3. Follow the cabling instructions, if any, that come with the adapter. Route the adapter cables before you install the adapter.
4. Follow the instructions that come with the adapter to set jumpers or switches, if any.
5. Loosen the captive screw on the rear of the server, and remove the riser-card assembly. Place the riser-card assembly on a flat, static-protective surface.



6. Remove the expansion-slot cover.

Attention: PCI expansion-slot covers must be installed on all vacant slots. This maintains the electronic emissions characteristics of the server and ensures proper cooling of server components.

7. Touch the static-protective package containing the adapter to any unpainted metal surface on the server. Then, remove the adapter from the static-protective package. Avoid touching the components and gold-edge connectors on the adapter.
8. Place the adapter, component side up, on a flat, static-protective surface and set any jumpers or switches as described by the adapter manufacturer, if necessary.

Attention: When you install an adapter, make sure that it is completely and correctly seated in the PCI expansion slot before you turn on the server. Incomplete insertion might cause damage to the system board or the adapter.

9. To install the adapter in the riser-card assembly, carefully grasp the adapter by its top edge or upper corners, and align it with the PCI-X expansion slot; then, press the adapter *firmly* into the expansion slot.
10. Reinstall the riser-card assembly. Make sure that the riser-card assembly is fully seated in the riser-card connector on the system board.
11. Tighten the captive screw on the rear of the server.

If you have other options to install, do so now. Otherwise, go to “Completing the installation” on page 41.

Installing a hard disk drive

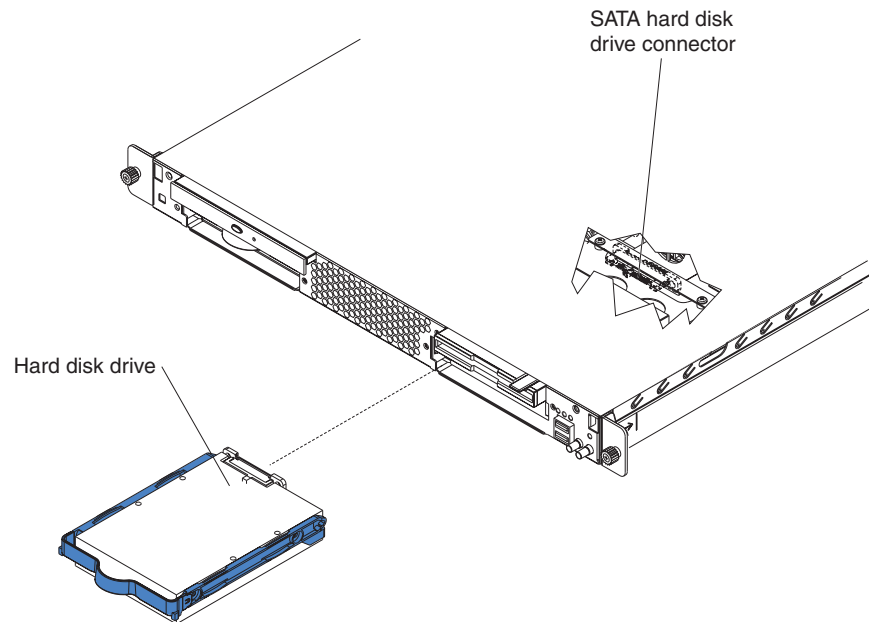
The following notes describe the type of hard disk drive that your server supports and other information that you must consider when installing a hard disk drive:

- Locate the documentation that comes with the hard disk drive, and follow those instructions in addition to the instructions in this chapter.
- The server comes with one integrated drive electronics (IDE) CD-ROM drive, one 1.44 MB diskette drive, and one serial advanced technology attachment (ATA) or SCSI hard disk drive, depending on server model.
- If you are installing a SCSI hard disk drive, see the documentation that comes with your drive before installing it.

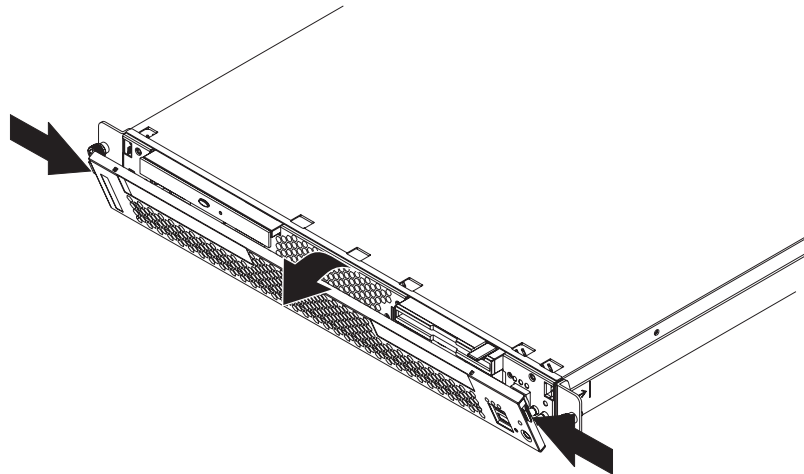
Installing a simple swap Serial ATA hard disk drive

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

Note: If you have only one hard disk drive, install it in the left drive bay.



1. Read the safety information beginning on page 83 and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables.
3. Press the release tabs on the bezel, and pull the bezel away from the server.



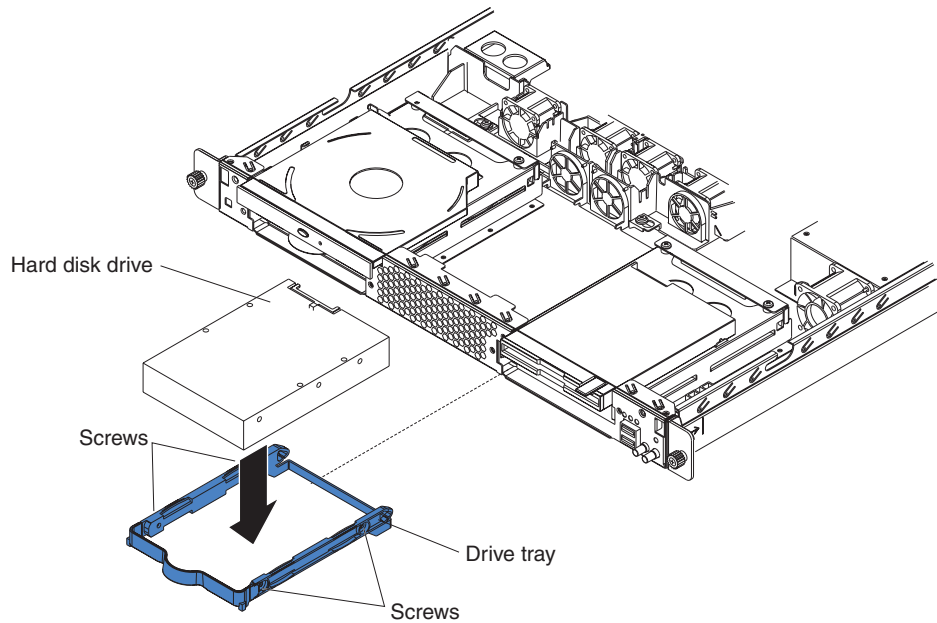
4. Slide the drive into the server until the drive connects to the backplane.
5. Reinstall the bezel.

If you have other options to install, do so now. Otherwise, go to “Completing the installation” on page 41.

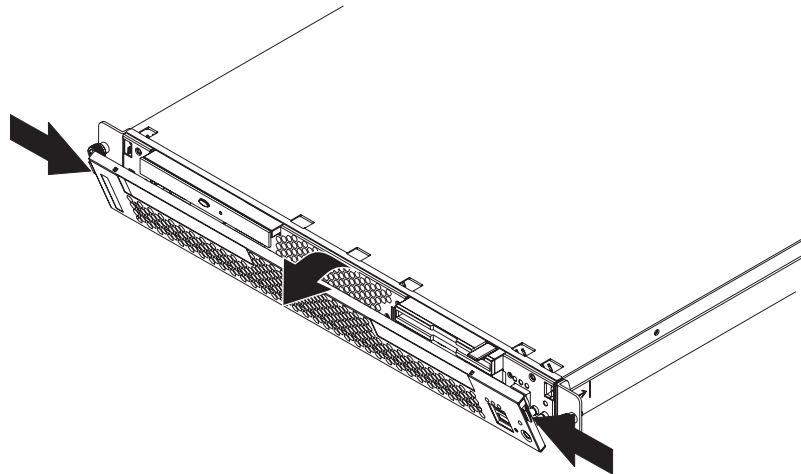
Installing a SCSI hard disk drive

Complete the following steps to install a SCSI hard disk drive.

Note: If you have only one hard disk drive, install it in the left drive bay.



1. Read the safety information beginning on page 83 and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables. Remove the cover (see “Removing the cover” on page 32).
3. Press the release tabs on the bezel, and pull the bezel away from the server.



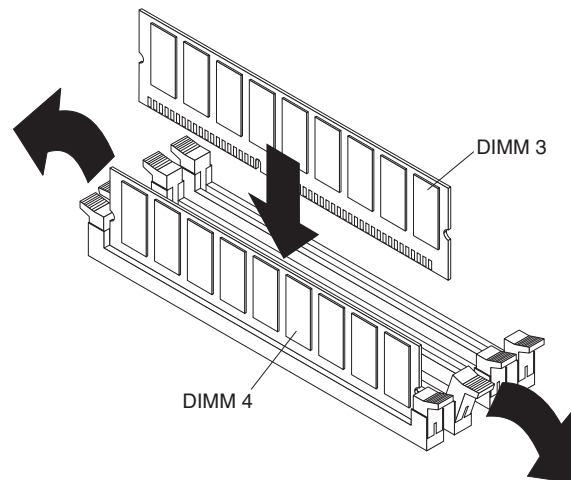
4. Slide the drive tray out of the server.
5. Position the drive on the drive tray.
6. Secure the drive using the screws that come with the option.
7. Slide the drive tray back into the server.
8. Connect the signal and power cables to the drive.
9. Reinstall the bezel.

If you have other options to install, do so now. Otherwise, go to “Completing the installation” on page 41.

Installing a memory module

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

- Your server supports 256 MB, 512 MB, and 1 GB DIMMs, for a maximum of 4 GB of system memory. Go to the ServerProven[®] list at <http://www.ibm.com/servers/eserver/serverproven/compat/us/> for a list of memory modules you can use with your server.
- The amount of usable memory will be reduced depending on the system configuration. A certain amount of memory must be reserved for system resources. The BIOS will display the total amount of installed memory and the amount of configured memory.
- Your server comes with one 512 MB DIMM installed in DIMM connector 1. If your system has one DIMM installed, when you install an additional DIMM, it must be installed in DIMM connector 3, and must be the same size, speed, type, and technology as the DIMM installed in DIMM connector 1. You can mix compatible DIMMs from various manufacturers.
- If you install a second pair of DIMMs in DIMM connectors 2 and 4, they do not have to be the same size, speed, type, and technology as the DIMMs installed in DIMM connectors 1 and 3. However, the size, speed, type, and technology of the DIMMs you install in DIMM connectors 2 and 4 must match each other.
- Install only 2.5 V, 184-pin, double-data-rate (DDR), PC2700 or PC3200, unbuffered synchronous dynamic random-access memory (SDRAM) with error correcting code (ECC) DIMMs. These DIMMs must be compatible with the latest PC2700 and PC3200 SDRAM unbuffered DIMM specification.
- When you restart the server, the system displays a message indicating that the memory configuration has changed.



Complete the following steps to install a DIMM:

1. Read the safety information beginning on page 83 and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables. Remove the cover (see “Removing the cover” on page 32).
Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, open and close the clips gently.
3. Open the retaining clip on each end of the DIMM connector.
4. Touch the static-protective package containing the DIMM to any unpainted metal surface on the server. Then, remove the DIMM from the package.
5. Turn the DIMM so that the DIMM keys align correctly with the slot.
6. Insert the DIMM into the connector by aligning the edges of the DIMM with the slots at the ends of the DIMM connector. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is firmly seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly inserted; open the retaining clips, remove the DIMM, and then reinsert it.

If you have other options to install, do so now. Otherwise, go to “Completing the installation” on page 41.

Replacing a fan assembly

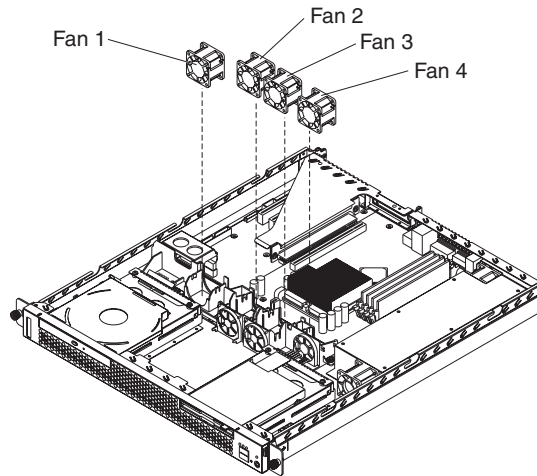
The server comes with four replaceable fans.

Complete the following steps to replace a fan assembly. Use this procedure to replace any of the four replaceable fans.

1. Read the safety information beginning on page 83 and “Installation guidelines” on page 27.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables. Remove the cover (see “Removing the cover” on page 32).
3. Determine which fan to replace by checking the LED at each fan; a lit LED indicates the fan to replace.

Note: For more information about the LEDs, see “Error LEDs” on page 23.

4. Remove the fan from the server:
 - a. Disconnect the fan cable from the system board.
 - b. Lift the fan out of the server.



5. Position the replacement fan so that the airflow arrow on the side of the fan is pointing toward the rear of the server.

Note: Correct airflow is from the front to the rear of the server.

6. Install the replacement fan in the location from which you removed the failed fan.
7. Connect the replacement fan cable to the system board.

If you have other options to install, do so now. Otherwise, go to “Completing the installation” on page 41.

Replacing the battery

When replacing the battery, you must replace it with a lithium battery of the same type from the same manufacturer. To avoid possible danger, read and follow the safety statement below.

To order replacement batteries, call 1-800-426-7378 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.

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

Statement 2:



CAUTION:

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

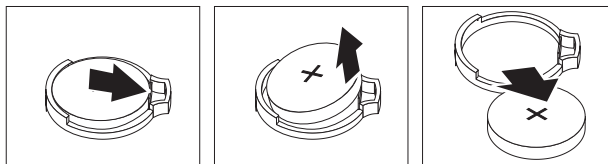
Do not:

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

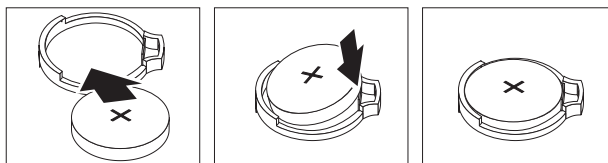
Dispose of the battery as required by local ordinances or regulations.

Complete the following steps to replace the battery:

1. Read the safety information beginning on page 83 and follow any special handling and installation instructions supplied with the replacement battery.
2. Turn off the server and peripheral devices, and disconnect the power cord and all external cables. Remove the cover (see “Removing the cover” on page 32).
3. Remove the riser-card assembly.
4. Remove the battery:
 - a. Press the battery release tab to release the battery from the socket.
 - b. Lift the battery out of the socket.



5. Insert the new battery:
 - a. Tilt the battery so that you can insert it into the socket.
 - b. Press down on the battery after you insert it into the socket.



6. Reinstall the riser-card assembly.
7. Reinstall the server cover.
8. Reconnect all external cables and the power cord; then, turn on the peripheral devices and the server.
9. Start the Configuration/Setup Utility program and set configuration parameters.
 - Set the system date and time and the user (power-on) password.
 - Reconfigure your server.

Completing the installation

Complete the following steps to complete the installation:

1. Reinstall the cover. See “Installing the cover” for more information.
2. Install the server in the rack cabinet. See the *Rack Installation Instructions* that come with your server for detailed information about how to install the server in a rack cabinet.

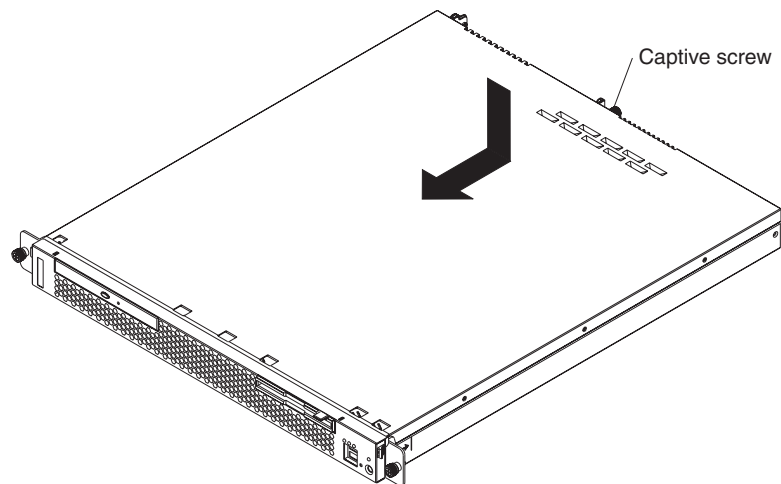
Attention:

- Install your server only in a rack cabinet with perforated doors.
 - Do not leave open space above or below an installed server in the rack cabinet. To help prevent damage to server components, always install a filler panel to cover the open space and to help ensure proper air circulation. See the documentation that comes with the rack cabinet for more information.
3. Connect the cables and power cords. See “Connecting the cables” for more information.
 4. Update the server configuration. See “Updating the server configuration” on page 42 for more information.

Attention: For proper cooling and airflow, replace the server cover before or shortly after turning on the server. Operating the server for extended periods of time (more than 15 minutes) with the server cover removed might damage server components.

Installing the cover

To install the cover, place it into position and slide it forward. Then, tighten the captive screw.



Connecting the cables

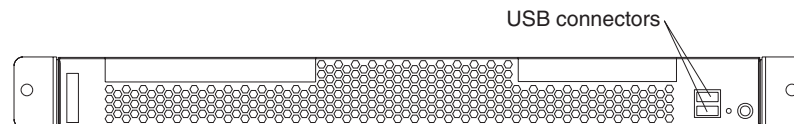
The following illustrations show the locations of the input and output connectors on the front and rear of your server.

Notes:

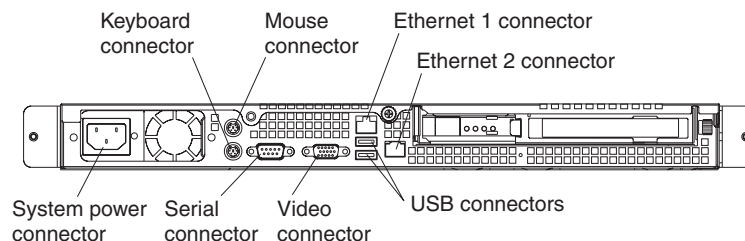
1. You must turn off the server before connecting or disconnecting cables from your server.
2. See the documentation that comes with your external devices for additional cabling instructions. It might be easier for you to route cables before you connect the devices to the server.

3. Cable identifiers are printed on the cables that come with your server and options. Use these identifiers to connect the cables to the correct connectors.
4. If your server comes with an operating system installed, see the documentation that comes with your software for additional cabling instructions.
5. There is one keyboard connector on the back of the server. Use this connector to connect the server to a keyboard or optional console switch. You can also connect a USB keyboard to the server using one of the USB ports. After installing a USB keyboard, you might need to use the Configuration/Setup Utility program to enable keyboardless operation and prevent the POST error message 301 from being displayed during startup. For detailed information about this option and how to connect it to your server, see the documentation that comes with the option. If your server cables and connector panel have color-coded connections, match the color of the cable end with the color of the connector. For example, match a blue cable end with a blue panel connector, a red cable end with a red connector, and so on.

Front



Rear



Updating the server configuration

When you start the server for the first time after you add or remove an internal option or external SCSI device, you might receive a message that the configuration has changed. The Configuration/Setup Utility program starts automatically so that you can save the new configuration settings. For more information, see Chapter 2, “Configuring the xSeries 306 server,” on page 11.

Some options have device drivers that you need to install. See the documentation that comes with the device for information about installing any required device drivers.

If the server has a RAID configuration using the SCSI controller with HostRAID (SCSI models only) or the integrated Serial ATA controller with HostRAID and you have installed or removed a hard disk drive, you might have to reconfigure your disk arrays. See the RAID documentation on the *Adaptec HostRAID Support CD* for more information about reconfiguring the disk arrays.

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

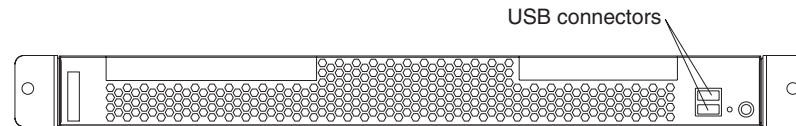
For more information about configuring the integrated Gigabit Ethernet controllers, see the *User's Guide*.

Input/output ports and connectors

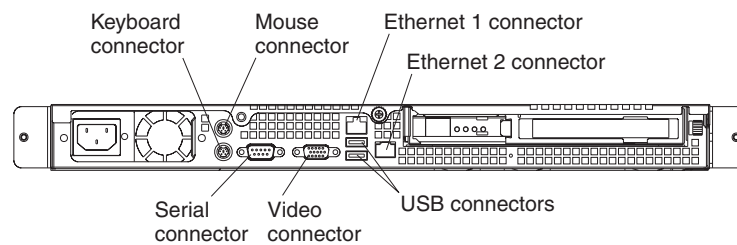
Your server has the following input/output (I/O) connectors:

- One auxiliary-device (pointing-device)
- Two Ethernet
- One keyboard
- One serial
- Four Universal Serial Bus (USB)
- One video

The following illustration shows the locations of these connectors on the front of the server.



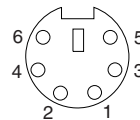
The following illustration shows the locations of these connectors on the rear of the server.



The following sections describe these connectors.

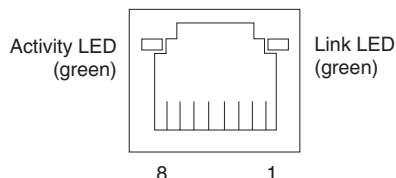
Auxiliary-device connector

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



Ethernet connectors

The following illustration shows an Ethernet connector.

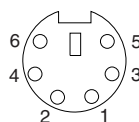


Connect a Category 3, 4, or 5 unshielded twisted-pair cable to this connector. The 100BASE-TX/1000BASE-T Fast Ethernet standard requires Category 5 or higher cabling.

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

Keyboard connector

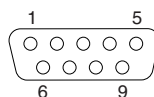
Use this connector to connect a PS/2 (non-USB) keyboard to the server. The following illustration shows a keyboard connector.



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

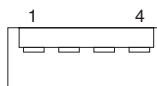
Serial connector

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



Universal Serial Bus connectors

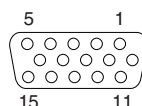
Use a Universal Serial Bus (USB) connector to connect a USB device. USB technology transfers data at up to 12 Mb per second (Mbps) with a maximum of 127 devices and a maximum signal distance of 5 meters (16 ft.) per segment. Using Plug and Play technology, USB devices are configured automatically. The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



If you connect a PS/2 (non-USB) keyboard to the keyboard connector, USB ports and devices are disabled during POST.

Video connector

The integrated video controller provides the video connector. The connector is on the rear of the server. The following illustration shows a video connector.

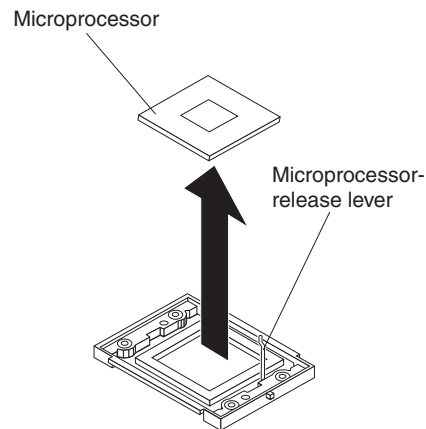


Chapter 5. Service replaceable units

This chapter describes the removal of server components.

Important: The field replaceable unit (FRU) procedures are intended for trained servicers who are familiar with IBM products. See the parts listing in Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU.

Removing and replacing a microprocessor



Complete the following steps to remove a microprocessor.

Note:

- Read “Handling static-sensitive devices” on page 27.
 - Read Appendix B, “Safety information,” on page 83.
1. Turn off the server, and disconnect all power cords and external cables; then, remove the server cover (see “Removing the cover” on page 32).
 2. Remove the air baffle (see “Removing and replacing the air baffle” on page 52).
 3. Remove the heat sink:
 - a. Loosen the screw on each of the two leaf springs on the retention module.

Note: Loosening one screw fully before loosening the other screw will help to break the thermal bond that adheres the heat sink to the microprocessor.

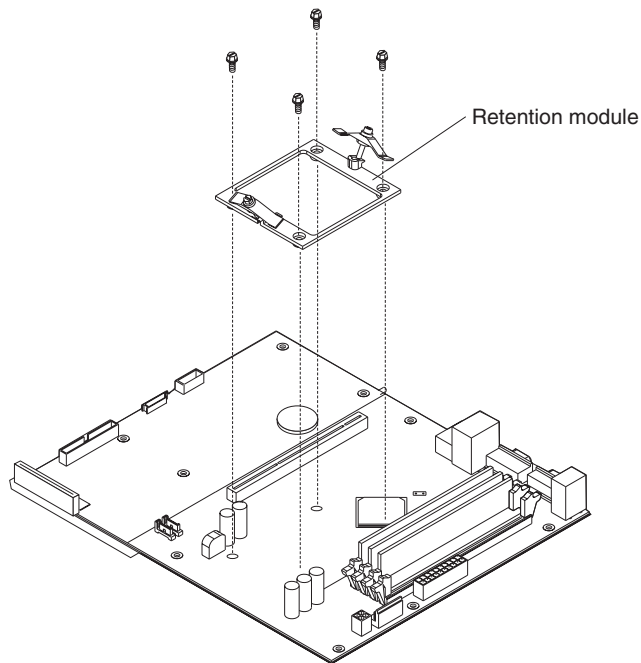
- b. Pivot the leaf-spring enclosure outward.
- c. Gently twist the heat sink until you break the thermal bond, and pull the heat sink away from the retention module and the microprocessor.

Important: Be careful when handling the thermal bond material on the processor. If the thermal bond material on the processor will be reused, do not contaminate it. If replacement thermal bond material is provided with the replacement part, be sure to remove all traces of existing thermal bond material from the processor before applying the new thermal bond material.

4. Open the release lever of the microprocessor socket.
5. Pull the microprocessor out of the socket.

To install a microprocessor, reverse the previous steps.

Removing and replacing the retention module



Complete the following steps to remove the retention module.

Note:

- Read “Installation guidelines” on page 27.
 - Read Appendix B, “Safety information,” on page 83.
 - Read “Handling static-sensitive devices” on page 27.
1. Turn off the server, and disconnect all power cords and external cables; then, remove the server cover (see “Removing the cover” on page 32).
 2. Remove the air baffle (see “Removing and replacing the air baffle” on page 52).
 3. Remove the heat sink:
 - a. Loosen the screw on each of the two leaf springs on the retention module.

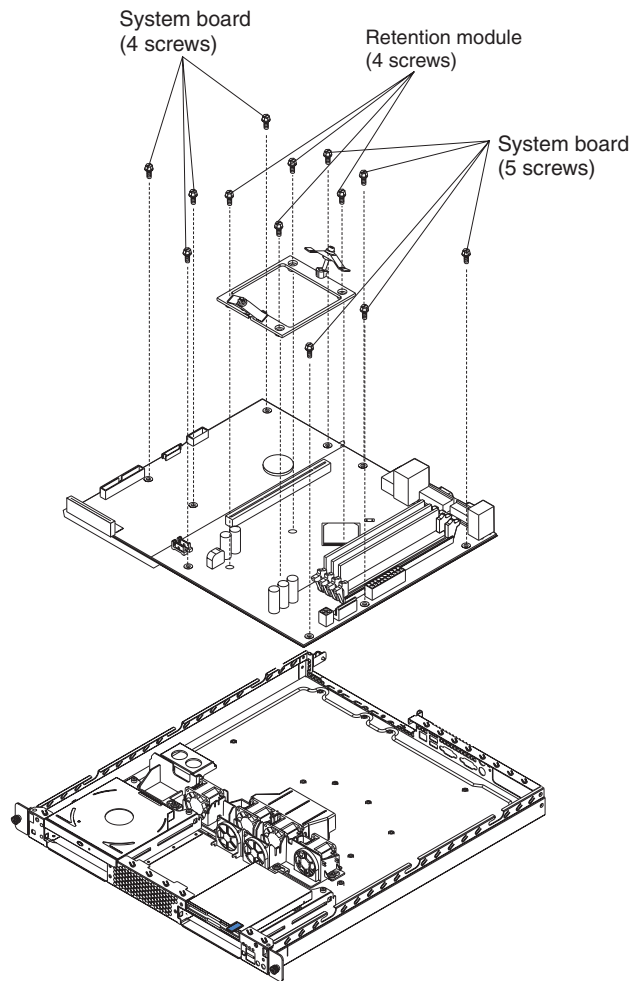
Note: Loosening one screw fully before loosening the other screw will help to break the thermal bond that adheres the heat sink to the microprocessor.
 - b. Pivot the leaf-spring enclosure outward.
 - c. Gently twist the heat sink until you break the thermal bond, and pull the heat sink away from the retention module and the microprocessor.
 4. Loosen the four screws on the corners of the retention module, and lift the retention module out of the server.

To install a retention module, reverse the previous steps.

Removing and replacing the system board

Important: When replacing the system board, you must:

- Either update the firmware to the latest level, or restore the pre-existing firmware that the customer provides on a diskette or CD.
- Update the UUID (see “Updating the UUID” on page 26).
- Update the DMI/SMBIOS (see “Updating the DMI/SMBIOS data” on page 26).



Complete the following steps to remove the system board.

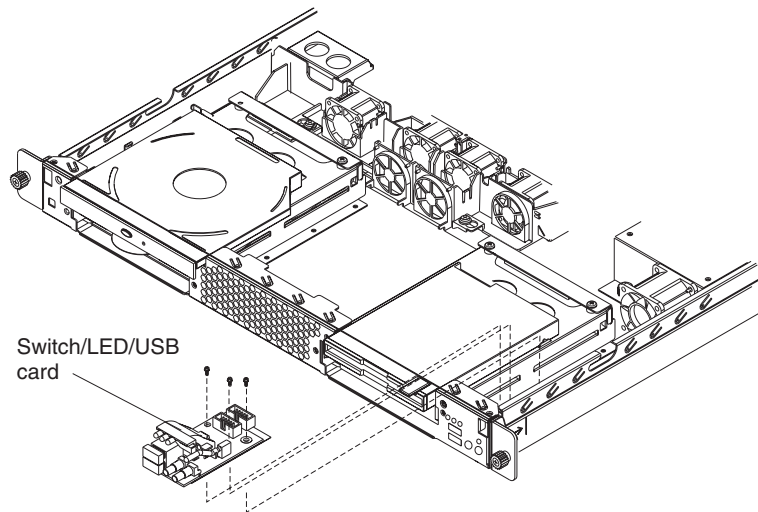
Note:

- Read “Installation guidelines” on page 27.
 - Read Appendix B, “Safety information,” on page 83.
 - Read “Handling static-sensitive devices” on page 27.
1. Turn off the server, and disconnect all power cords and external cables; then, remove the server cover (see “Removing the cover” on page 32).
 2. Remove the air baffle (see “Removing and replacing the air baffle” on page 52).
 3. Remove all adapters, and place them on a static-protective surface for reinstallation (see “Installing an adapter” on page 32).
 4. Remove all DIMMs, and place them on a static-protective surface for reinstallation (see “Installing a memory module” on page 37).
 5. Disconnect all cables from the system board.
 6. Remove the microprocessor and the retention module, and place them on a static-protective surface for reinstallation (see “Removing and replacing a microprocessor” on page 45 and “Removing and replacing the retention module” on page 46).
 7. Remove the screws that secure the system board with the chassis, and put the screws in a safe place.
 8. Lift the system board out of the server.

To reinstall the system board, align the system board with the chassis, and replace the screws that you removed in step 7. Replace all components, including the retention module and microprocessor, in the reverse order from which they were removed.

Note: When reassembling the components in the server, be sure to route all cables carefully so that they are not exposed to excessive pressure.

Removing and replacing the switch/LED/USB card



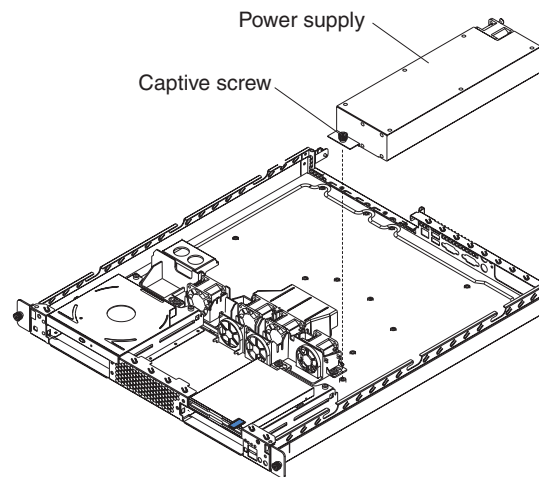
Complete the following steps to remove the Switch/LED/USB card.

Note:

- Read “Installation guidelines” on page 27.
 - Read Appendix B, “Safety information,” on page 83.
 - Read “Handling static-sensitive devices” on page 27.
1. Turn off the server, and disconnect all power cords and external cables; then, remove the server cover (see “Removing the cover” on page 32).
 2. Disconnect the cables from the switch/LED/USB card.
 3. Loosen the screws on the switch/LED/USB card, and remove the card.

To install the switch/LED/USB card, reverse the previous steps.

Removing and replacing a power supply



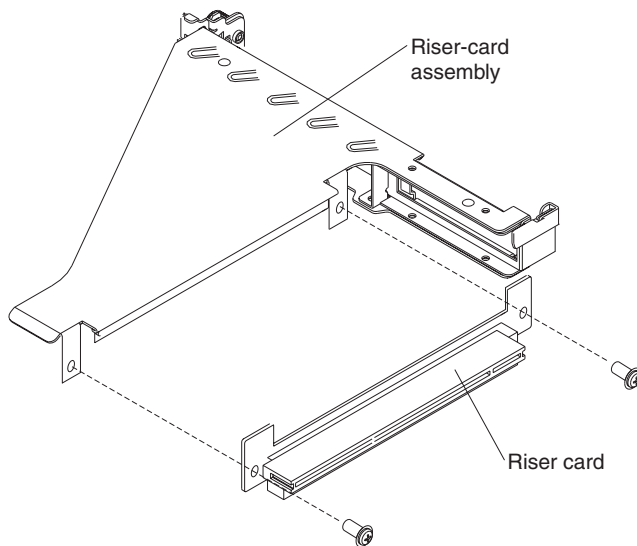
Complete the following steps to remove the power supply.

Note:

- Read “Installation guidelines” on page 27.
 - Read Appendix B, “Safety information,” on page 83.
 - Read “Handling static-sensitive devices” on page 27.
1. Turn off the server, and disconnect all power cords and external cables; then, remove the server cover (see “Removing the cover” on page 32).
 2. Disconnect the cables near the power supply.
 3. Loosen the captive screw that secures the power supply to the chassis.
 4. Lift the power supply out of the server.

To install the power supply, reverse the previous steps.

Removing and replacing the PCI riser card

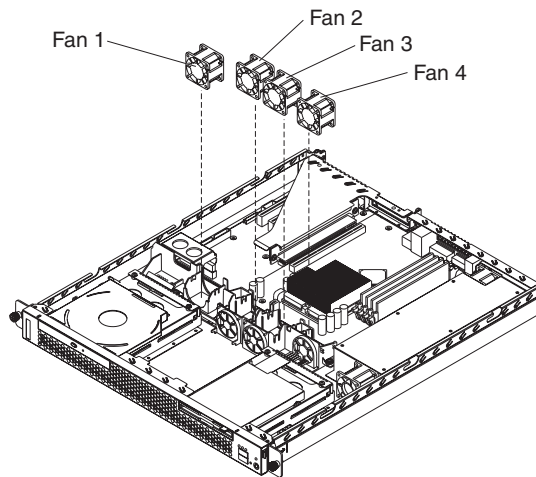


Complete the following steps to remove the PCI riser card.

Note:

- Read “Installation guidelines” on page 27.
 - Read Appendix B, “Safety information,” on page 83.
 - Read “Handling static-sensitive devices” on page 27.
1. Turn off the server, and disconnect all power cords and external cables; then, remove the server cover (see “Removing the cover” on page 32).
 2. Loosen the captive screw that secures the power supply to the chassis.
 3. Remove the PCI riser-card assembly from the server.
 4. Remove the screws from the PCI riser card.

Removing and replacing the fans



The server comes with six replaceable fans. Complete the following steps to replace a fan assembly.

Note:

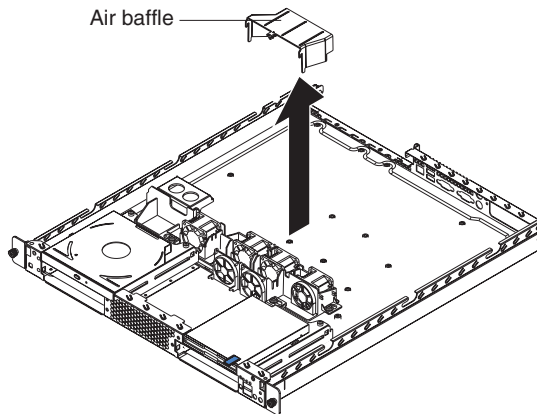
- Read “Installation guidelines” on page 27.
 - Read Appendix B, “Safety information,” on page 83.
 - Read “Handling static-sensitive devices” on page 27.
1. Turn off the server, and disconnect all power cords and external cables; then, remove the server cover (see “Removing the cover” on page 32).
 2. Determine which fan to replace by checking the LED at each fan; a lit LED indicates the fan to replace.

Note:

- a. When the fans 2 and 3 error LED is lit, it indicates fan 2 or fan 3 has failed or is operating too slowly. Replace both fans, if the LED is lit.
 - b. When the Fans 4 and 5 error LED is lit, it indicates fan 4 or fan 5 has failed or is operating too slowly. Replace both fans, if the LED is lit.
 - c. For more information about the LEDs, see “System-board LEDs” on page 30.
3. Disconnect the fan cable from the system board.
 4. Lift the fan out of the server, noting its orientation in the server.

To install a fan, orient the fan so that the airflow arrow on the side of the fan is facing or pointing toward the rear of the server; then, insert the fan in the fan cage. Connect the fan cable to the system board.

Removing and replacing the air baffle



Complete the following steps to remove the air baffle.

Note:

- Read “Installation guidelines” on page 27.
 - Read Appendix B, “Safety information,” on page 83.
 - Read “Handling static-sensitive devices” on page 27.
1. Turn off the server, and disconnect all power cords and external cables; then, remove the server cover (see “Removing the cover” on page 32).
 2. Grasp the air baffle on each side, and lift the air baffle from the server.

To install the air baffle, reverse the previous steps.

Chapter 6. Symptom-to-FRU index

The symptom-to-FRU index lists symptoms, errors, and the possible causes. The most likely cause is listed first. Use this symptom-to-FRU index to help you decide which FRUs to have available when servicing the server.

Notes:

1. Check the configuration before you replace a FRU. Configuration problems can cause false errors and symptoms.
2. For IBM devices not supported by this index, refer to the manual for that device.
3. Always start with “General checkout” on page 17.
4. Some tables have more than two columns; in those instances, more than one column on the left is required to describe the error symptom. Take the action (or replace the FRU) suggested first in the list of the right-hand column, then try the server again to see if the problem has been corrected before taking further action.
5. Always try reseating a suspected component or reconnecting a cable before replacing the component.

The left-hand column of the tables in this index lists error codes or messages, and the right-hand column lists one or more suggested actions or FRUs to replace.

The POST BIOS code displays POST error codes and messages on the screen.

Beep symptoms

Beep symptoms are short tones or a series of short tones separated by pauses (intervals without sound). See the examples in the following table.

Beeps	Description
1-2-3	<ul style="list-style-type: none">• One beep• A pause (or break)• Two beeps• A pause (or break)• Three beeps
4	Four continuous beeps

One beep after successfully completing POST indicates that the server is functioning correctly.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Beep/symptom	FRU/action
1-1-3 (CMOS write/read test failed)	1. Battery 2. System board
1-1-4 (BIOS EEPROM checksum failed)	System board
1-2-1 (Programmable Interval Timer failed)	System board

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Beep/symptom	FRU/action
1-2-2 (DMA initialization failed)	System board
1-2-3 (DMA page register write/read failed)	System board
1-3-1 (first 64K RAM test failed)	1. DIMM 2. System board
1-3-2 (first 64K RAM test failed)	1. DIMM 2. System board
2-1-1 (Secondary DMA register failed)	System board
2-1-2 (Primary DMA register failed)	System board
2-1-3 (Primary interrupt mask register failed)	System board
2-1-4 (Secondary interrupt mask register failed)	System board
2-2-2 (Keyboard controller failed)	1. Keyboard 2. System board
2-2-3 (CMOS power failure and checksum checks failed)	1. Battery 2. System board
2-4-1 (Video failed; system believed operable)	System board
3-1-1 (Timer tick interrupt failed)	System board
3-1-2 (Interval timer channel 2 failed)	System board
3-1-3 (RAM test failed above address OFFFFH))	1. DIMM 2. System board
3-1-4 (Time-of-Day clock failed)	1. Battery 2. System board
3-2-1 (Serial port failed)	System board
3-2-2 (Parallel port failed)	System board
3-2-4 (Failure comparing CMOS memory size against actual)	1. DIMM 2. Battery 3. System board

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Beep/symptom	FRU/action
3-3-1 (Memory size mismatch occurred.)	<ol style="list-style-type: none"> 1. DIMM 2. Battery 3. System board
3-3-2 (I2C bus error occurred)	<ol style="list-style-type: none"> 1. Disconnect server power, wait 30 seconds, and try again. 2. System board
3-3-3 (No memory installed)	<ol style="list-style-type: none"> 1. Install or reseat the memory modules. 2. DIMMs. 3. System board.

No-beep symptoms

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

No-beep symptom	FRU/action
No beep during POST.	System board

POST error codes

In the following error codes, x can be any number or letter.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Error code/symptom	FRU/action
062 (Three consecutive startup failures using the default configuration.)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. System board. 4. Microprocessor.
101, 102 (System and processor error)	System board
106 (System and processor error)	System board
114 (Adapter read-only memory error.)	<ol style="list-style-type: none"> 1. Run diagnostics. 2. Adapter
151 (Real time clock error)	<ol style="list-style-type: none"> 1. Battery 2. System board
161 (Real time clock battery error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. System board.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Error code/symptom	FRU/action
162 (Device configuration error) Note: Be sure to load the default settings and any additional desired settings; then, save the configuration.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. Failing device. 4. System board.
163 (Real-time clock error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. System board.
164 (Memory configuration changed.)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. DIMM. 3. System board.
176 (Computer cover or cable cover removed without use of key.)	Run the Configuration/Setup Utility program.
184 (Power-on password damaged)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. System board.
185 (Drive startup sequence information damaged.)	Run the Configuration/Setup Utility program.
187 (VPD serial number not set.)	<ol style="list-style-type: none"> 1. Set serial number in the Configuration/Setup Utility program. 2. System board.
188 (Bad EEPROM CRC #2)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. System board.
189 (An attempt was made to access the server with invalid passwords)	Run the Configuration/Setup Utility program, and enter the administrator password.
201 (Memory test error.) If the server does not have the latest level of BIOS installed, update the BIOS to the latest level and run the diagnostic program again.	<ol style="list-style-type: none"> 1. DIMM 2. System board
289 (DIMM disabled by POST or user)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program, if the DIMM was disabled by the user. 2. Disabled DIMM, if not disabled by user. 3. System board
301 (Keyboard or keyboard controller error)	<ol style="list-style-type: none"> 1. Keyboard 2. System board
303 (Keyboard controller error)	System board
602 (Invalid diskette boot record)	<ol style="list-style-type: none"> 1. Diskette 2. Diskette drive 3. Cable 4. System board

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Error code/symptom	FRU/action
604 (Diskette drive error.)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Diskette drive 3. Cable 4. System board
662 (Diskette drive configuration error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and diagnostics. 2. Diskette drive. 3. Drive cable. 4. System board.
962 (Parallel port error)	<ol style="list-style-type: none"> 1. Disconnect the external cable on the parallel port. 2. Run the Configuration/Setup Utility program. 3. System board.
1162 (Serial port configuration conflicts)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and ensure that the IRQ and I/O port assignments needed by the serial port are available. 2. If all interrupts are being used by adapters, remove an adapter or force other adapters to share an interrupt.
1762 (Hard disk configuration error)	<ol style="list-style-type: none"> 1. Hard disk drive. 2. Hard disk drive cables. 3. Run the Configuration/Setup Utility program. 4. SCSI backplane. 5. System board.
1800 (No more hardware interrupts available for PCI adapter)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Remove the adapter.
1801 (No more hardware interrupts available for PCI adapter)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Remove the adapter. 3. Disable the adapter BIOS, and run the Configuration/Setup Utility program.
1962 (Drive does not contain a valid boot sector)	<ol style="list-style-type: none"> 1. Verify that a startable operating system is installed. 2. Run diagnostics. 3. Hard disk drive. 4. SCSI backplane. 5. Cable. 6. System board.
5962 (IDE CD-ROM drive configuration error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. CD-ROM drive. 3. CD-ROM power cable. 4. IDE cable. 5. System board. 6. Battery.
8603 (Pointing-device error)	<ol style="list-style-type: none"> 1. Pointing device 2. System board

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Error code/symptom	FRU/action
0001200 (Machine check architecture error)	<ol style="list-style-type: none"> 1. Microprocessor 1 2. Optional microprocessor 2 3. System board
00019701 (Microprocessor failed BIST)	<ol style="list-style-type: none"> 1. Microprocessor 2. System board
00180200 (No more I/O space available for PCI adapter.)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Adapter. 3. System board.
00180300 (No more memory above 1 MB for PCI adapter.)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Adapter. 3. System board.
00180500 (PCI option ROM checksum error.)	<ol style="list-style-type: none"> 1. PCI adapter. 2. System board.
00180600 (PCI device BIST failure.)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Adapter. 3. System board.
00180700 (PCI device not responding.)	<ol style="list-style-type: none"> 1. System board 2. Adapter
00181000 (No more I/O space available for PCI adapter.)	<ol style="list-style-type: none"> 1. Adapter 2. System board
I9990650 (AC power has been restored)	<ol style="list-style-type: none"> 1. Check cable. 2. Check for interruption of power. 3. Power cable.

Diagnostic error codes

Note: In the following error codes, if XXX is 000, 195, or 197, do not replace a FRU. The description for these error codes are:

- 000** The test passed.
- 195** The Esc key was pressed to stop the test.
- 197** Warning; a hardware failure did not occur. The test could not be run due to some other problem.

For all error codes, replace the FRU or take the action indicated.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Error code/symptom	FRU/action
001-250-000 (Failed system board ECC)	System board
001-250-001 (Failed system board ECC)	System board
001-XXX-000 (Failed core tests)	System board
001-XXX-001 (Failed core tests)	System board
005-XXX-000 (Failed video test)	<ol style="list-style-type: none"> 1. Video adapter (if installed) 2. System board
011-XXX-000 (Failed COM1 serial port test)	<ol style="list-style-type: none"> 1. Check loopback plug connected to externalized serial port. 2. Check cable from externalized port to system board. 3. System board.
011-XXX-001 (Failed COM2 serial port test)	<ol style="list-style-type: none"> 1. Check loopback plug connected to externalized serial port. 2. Check cable from externalized port to system board. 3. System board.
014-XXX-000 (Failed parallel port test)	System board
015-XXX-001 (USB interface not found, board damaged)	System board
015-XXX-015 (Failed USB external loopback test)	<ol style="list-style-type: none"> 1. Make sure the parallel port is not disabled. 2. Run the USB external loopback test again. 3. System board.
015-XXX-198 (Remote Supervisor Adapter II installed <i>or</i> USB device connected during USB test)	<ol style="list-style-type: none"> 1. If Remote Supervisor Adapter II is installed as an option, remove it and rerun test. Note: If Remote Supervisor Adapter II is present as a standard installation, do not remove it; the test cannot be run. 2. Remove USB devices and rerun test. 3. System board.
020-XXX-000 (Failed PCI interface test)	System board
030-XXX-00N (Failed SCSI interface test)	If N=0, SCSI daughter card; if N>0, SCSI adapter in slot N.
035-253-s99 (RAID adapter initialization failure)	<ol style="list-style-type: none"> 1. ServeRAID adapter in slot s is not configured properly. Obtain the basic and extended configuration status and see the <i>ServeRAID Hardware Maintenance Manual</i> for more information. 2. Cable. 3. Adapter.
035-XXX-099 (No adapters were found.)	If adapter is installed re-check connection.
035-XXX-s99 (Failed RAID test on PCI slot s. s = number of failing PCI slot.)	<ol style="list-style-type: none"> 1. RAID adapter 2. Cable 3. System board

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Error code/symptom	FRU/action
035-XXX-snn (s = number of failing PCI slot, nn = SCSI ID of failing fixed disk.)	Hard disk drive with SCSI ID nn on RAID adapter in PCI slot s.
089-XXX-001 (Failed microprocessor test)	<ol style="list-style-type: none"> 1. Make sure that microprocessor 1 is installed and seated correctly. 2. Make sure that BIOS code is at latest level. 3. Microprocessor 1. 4. System board.
089-XXX-002 (Failed optional microprocessor test)	<ol style="list-style-type: none"> 1. Make sure that microprocessor 2 is installed and seated correctly. 2. Make sure that BIOS code is at latest level. 3. Microprocessor 2. 4. System board.
201-XXX-0nn (Failed memory test.)	<ol style="list-style-type: none"> 1. DIMM Location slots 1-4 where nn = DIMM location. Note: nn 1=DIMM 1; 2=DIMM 2; 3=DIMM 3; 4=DIMM 4. 2. System board.
201-XXX-999 (Multiple DIMM failure, see error text)	<ol style="list-style-type: none"> 1. See error text for failing DIMMs. 2. System board.
202-XXX-001 (Failed system cache test)	<ol style="list-style-type: none"> 1. Make sure that microprocessor 1 is installed and seated correctly. 2. Make sure that BIOS code is at latest level. 3. Microprocessor 1. 4. System board.
202-XXX-002 (Failed system cache test)	<ol style="list-style-type: none"> 1. Make sure that microprocessor 2 is installed and seated correctly. 2. Make sure that BIOS code is at latest level. 3. Microprocessor 2. 4. System board.
206-XXX-000 (Failed diskette drive test)	<ol style="list-style-type: none"> 1. Rerun the test using another diskette. 2. Cable. 3. Diskette drive. 4. System board.
215-XXX-000 (Failed IDE CD-ROM drive test)	<ol style="list-style-type: none"> 1. Rerun the test using another CD-ROM. 2. CD-ROM drive cables. 3. CD-ROM drive. 4. System board.
217-198-XXX (Could not establish drive parameters)	<ol style="list-style-type: none"> 1. Check cable and termination. 2. DASD backplane. 3. SCSI daughter card 4. Hard disk drive.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Error code/symptom	FRU/action
217-XXX-00n (Failed hard disk drive test) Note: If RAID is configured, the hard disk drive number refers to the RAID logical array.	<ol style="list-style-type: none"> 1. Hard disk drive n 2. SCSI card 3. DASD backplane
301-XXX-000 (Failed keyboard test)	<ol style="list-style-type: none"> 1. Keyboard 2. System board
302-XXX-000 (Failed mouse test)	<ol style="list-style-type: none"> 1. Mouse 2. System board
405-XXX-000 (Failed Ethernet test on controller on the system board)	<ol style="list-style-type: none"> 1. Make sure that Ethernet is not disabled in BIOS. 2. System board.
405-XXX-00n (Failed Ethernet test on adapter in PCI slot n)	<ol style="list-style-type: none"> 1. For n=0, system board 2. For n>0, adapter in PCI slot n 3. System board
405-XXX-a0n (Failed Ethernet test on adapter in PCI slot a)	<ol style="list-style-type: none"> 1. For a = 0, system board 2. For a > 0, adapter in PCI slot a
415-XXX-000 (Failed Modem test) Note: Error message may indicate modem is not supported.	<ol style="list-style-type: none"> 1. Cable Note: Ensure modem is present and attached to server. 2. Modem 3. System board

System board LED errors

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

LED	FRU/action
DIMM x	<ol style="list-style-type: none"> 1. DIMM x 2. System board
Standby power Note: Normal operation is indicated when this LED is lit and the server is connected to an ac power source. A problem is indicated if the LED is not lit when connected to ac power.	<ol style="list-style-type: none"> 1. Power supply 2. System board
System fan 2	<ol style="list-style-type: none"> 1. Fan 2 2. System board
System fan 1	<ol style="list-style-type: none"> 1. Fan 1 2. System board
Microprocessor	<ol style="list-style-type: none"> 1. Microprocessor 2. System board

Error symptoms

You can use the error symptom table to find solutions to problems that have definite symptoms.

If you cannot find the problem in the error symptom charts, go to “Starting the diagnostic programs and viewing the test log” on page 21 to test the server.

If you have just added new software or a new option and the server is not working, use the following procedures before using the error symptom charts:

- Remove the software or device that you just added.
- Run the diagnostic tests to determine whether the server is running correctly.
- Reinstall the new software or new device.

In the following table, if the entry in the FRU/action column is a suggested action, perform that action; if it is the name of a component, reseal the component and replace it if necessary. The most likely cause of the symptom is listed first.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.	
CD-ROM drive problems	
Symptom	FRU/action
CD-ROM drive is not recognized.	<ol style="list-style-type: none">1. Make sure that:<ul style="list-style-type: none">• The IDE channel to which the CD-ROM drive is attached (primary or secondary) is enabled in the Configuration/Setup Utility program.• All cables and jumpers are installed correctly.• The correct device driver is installed for the CD-ROM drive.2. Run CD-ROM drive diagnostics.3. CD-ROM drive.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.	
Expansion enclosure problems	
Symptom	FRU/action
The SCSI expansion enclosure used to work but does not work now.	<ol style="list-style-type: none">1. Make sure that:<ul style="list-style-type: none">• The cables for all external SCSI options are connected correctly.• The last option in each SCSI chain, or the end of the SCSI cable, is terminated correctly.• Any external SCSI option is turned on. You must turn on an external SCSI option before turning on the server.2. For more information, see the SCSI expansion enclosure documentation.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.	
Hard disk drive problems	
Symptom	FRU/action
Not all drives are recognized by the hard disk drive diagnostic test (Fixed Disk test).	<ol style="list-style-type: none">1. Remove the first drive not recognized and try the hard disk drive diagnostic test again.2. If the remaining drives are recognized, replace the drive you removed with a new one.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Hard disk drive problems

Symptom	FRU/action
System stops responding during hard disk drive diagnostic test.	<ol style="list-style-type: none"> 1. Remove the hard disk drive being tested when the server stopped responding and try the diagnostic test again. 2. If the hard disk drive diagnostic test runs successfully, replace the drive you removed with a new one.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

General problems

Symptom	FRU/action
Problems such as broken cover locks or indicator LEDs not working	Broken CRU/FRU

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Intermittent problems

Symptom	FRU/action
A problem occurs only occasionally and is difficult to detect.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • All cables and cords are connected securely to the rear of the server and attached options. • When the server is turned on, air is flowing from the rear of the server at the fan grill. If there is no airflow, the fan is not working. This causes the server to overheat and shut down. • Ensure that the SCSI bus and devices are configured correctly and that the last external device in each SCSI chain is terminated correctly. 2. Check the system error log.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Keyboard, mouse, or pointing-device problems

Symptom	FRU/action
All or some keys on the keyboard do not work.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The keyboard cable is securely connected to the system, and the keyboard and mouse cables are not reversed. • The server and the monitor are turned on. 2. Keyboard. 3. System board.
The mouse or pointing device does not work.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The mouse or pointing-device cable is securely connected, and that the keyboard and mouse cables are not reversed. • The mouse device drivers are installed correctly. 2. Mouse or pointing device. 3. System board.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Memory problems	
Symptom	FRU/action
The amount of system memory displayed is less than the amount of physical memory installed.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The memory modules are seated properly. • You have installed the correct type of memory. • If you changed the memory, you updated the memory configuration with the Configuration/Setup Utility program. • All banks of memory on the DIMMs are enabled. The server might have automatically disabled a DIMM bank when it detected a problem or a DIMM bank could have been manually disabled. 2. Check POST error log for error message 289: <ul style="list-style-type: none"> • If the DIMM was disabled by a system-management interrupt (SMI), replace the DIMM. • If the DIMM was disabled by the user or by POST: <ol style="list-style-type: none"> a. Start the Configuration/Setup Utility program. b. Enable the DIMM. c. Save the configuration and restart the server. 3. DIMM. 4. System board.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Microprocessor problems	
Symptom	FRU/action
The server emits a continuous tone during POST. (The startup (boot) microprocessor is not working properly.)	<ol style="list-style-type: none"> 1. Make sure that the startup microprocessor is seated properly. 2. Startup microprocessor.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Monitor problems	
Symptom	FRU/action
Testing the monitor.	See the information that comes with the monitor for adjusting and testing instructions. (Some IBM monitors have their own self-tests.)

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Monitor problems	
Symptom	FRU/action
The screen is blank.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The server power cord is plugged into the server and a working electrical outlet. • The monitor cables are connected properly. • The monitor is turned on and the Brightness and Contrast controls are adjusted correctly. • If the servers are C2T chained together, verify that: <ul style="list-style-type: none"> – The C2T chain cables are securely connected to the servers. – The C2T breakout cable is connected properly. – A server that is turned on is selected. <p>Important: In some memory configurations, the 3-3-3 beep code might sound during POST followed by a blank display screen. If this occurs and the Boot Fail Count feature in the Start Options of the Configuration/Setup Utility program is set to Enabled (its default setting), you must restart the server three times to force the system BIOS to reset the CMOS values to the default configuration (memory connector or bank of connectors enabled).</p> <ol style="list-style-type: none"> 2. Make sure that damaged BIOS code is not affecting the video; see “Updating BIOS code” on page 23. 3. If you have verified these items and the screen remains blank, replace: <ol style="list-style-type: none"> a. Monitor b. Video adapter, if installed c. System board
Only the cursor appears.	See “Undetermined problems” on page 73.
The monitor works when you turn on the server but goes blank when you start some application programs.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The application program is not setting a display mode higher than the capability of the monitor. • The primary monitor cable is connected to the C2T device breakout cable. • You installed the necessary device drivers for the applications. 2. If you have verified these items and the screen remains blank, replace the monitor.
The screen is wavy, unreadable, rolling, distorted, or has screen jitter.	<ol style="list-style-type: none"> 1. If the monitor self-tests show the monitor is working properly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. (Moving a color monitor while it is turned on might cause screen discoloration.) Then move the device and the monitor at least 305 mm (12 in.) apart. Turn on the monitor. <p>Notes:</p> <ol style="list-style-type: none"> a. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.). b. Non-IBM monitor cables might cause unpredictable problems. c. An enhanced monitor cable with additional shielding is available for the 9521 and 9527 monitors. For information about the enhanced monitor cable, contact your IBM reseller or IBM marketing representative. 2. Video adapter, if installed. 3. System board.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Monitor problems	
Symptom	FRU/action
Wrong characters appear on the screen.	<ol style="list-style-type: none"> 1. If the wrong language is displayed, update the BIOS code with the correct language. 2. Video adapter, if installed. 3. System board.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Option problems	
Symptom	FRU/action
An IBM option that was just installed does not work.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The option is designed for the server (see the ServerProven list at http://www.ibm.com/servers/eserver/serverproven/compat/us/). • You followed the installation instructions that came with the option. • The option is installed correctly. • You have not loosened any other installed options or cables. • You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration. 2. Option you just installed.
An IBM option that used to work does not work now.	<ol style="list-style-type: none"> 1. Make sure that all of the option hardware and cable connections are secure. 2. If the option comes with its own test instructions, use those instructions to test the option. 3. If the failing option is a SCSI option, verify that: <ul style="list-style-type: none"> • The cables for all external SCSI options are connected correctly. • The last option in each SCSI chain, or the end of the SCSI cable, is terminated correctly. • Any external SCSI option is turned on. You must turn on an external SCSI option before turning on the server. 4. Failing option.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Power problems	
Symptom	FRU/action
The server does not turn on.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The power cables are properly connected to the server. • The electrical outlet functions properly. • The type of memory installed is correct. • If you just installed an option, remove it, and restart the server. If the server now turns on, you might have installed more options than the power supply supports. 2. If LEDs for microprocessors or VRMs are on, verify that: <ol style="list-style-type: none"> a. A VRM is installed if a second microprocessor is present. b. All microprocessors have the same speed. 3. See “Undetermined problems” on page 73.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Power problems

Symptom	FRU/action
The server does not turn off.	<ol style="list-style-type: none"> 1. Verify whether you are using an ACPI or non-ACPI operating system. If you are using a non-ACPI operating system: <ol style="list-style-type: none"> a. Press Ctrl+Alt+Delete. b. Turn off the system by holding the power-control button for 4 seconds. c. If server fails during BIOS POST and power-control button does not work, remove the AC power cord. 2. If the problem remains or if you are using an ACPI-aware operating system, suspect the system board.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Serial port problems

Symptom	FRU/action
The number of serial ports identified by the operating system is less than the number of serial ports installed.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • Each port is assigned a unique address by the Configuration/Setup Utility program and none of the serial ports is disabled. • The serial-port adapter, if you installed one, is seated properly. 2. Failing serial port adapter.
A serial device does not work.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • The device is compatible with the server. • The serial port is enabled and is assigned a unique address. • The device is connected to the correct port (see “Input/output ports and connectors” on page 43). 2. Failing serial device. 3. Serial adapter, if installed. 4. System board.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Software problem

Symptom	FRU/action
Suspected software problem.	<ol style="list-style-type: none"> 1. To determine if problems are caused by the software, verify that: <ul style="list-style-type: none"> • The server has the minimum memory needed to use the software. For memory requirements, see the information that comes with the software. Note: If you have just installed an adapter or memory, you might have a memory address conflict. • The software is designed to operate on the server. • Other software works on the server. • The software that you are using works on another system. <p>If you received any error messages when using the software program, see the information that comes with the software for a description of the messages and suggested solutions to the problem.</p> 2. If you have verified these items and the problem remains, contact your place of purchase.

Service processor error codes

When viewed from POST, service processor (baseboard management controller) error codes will appear in hexadecimal form (generally beginning with A2, A3, A4, A5, A6, A7, AD, AE, or E1), unless a Remote Supervisor Adapter is installed. However, when viewed from the System Error Log, the messages will appear as text. To determine a possible error condition for the service processor, see the System Error log (see “Starting the diagnostic programs and viewing the test log” on page 21).

ServeRAID error codes

In the following error codes, x can be any number or letter.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.	
Error code/symptom	FRU/action
1xxx (Microcode checksum error)	ServeRAID controller
2xxx (Code DRAM error)	<ol style="list-style-type: none">1. Install download jumpers, flash latest level BIOS and firmware for controller. Remove jumpers.2. ServeRAID controller.
3000-31xx (Code DRAM error)	<ol style="list-style-type: none">1. Install download jumpers, flash latest level BIOS and firmware for controller. Remove jumpers.2. ServeRAID controller.
3200 (Code DRAM error)	<ol style="list-style-type: none">1. Install download jumpers, flash latest level BIOS code and firmware for controller. Remove jumpers.2. ServeRAID controller.
3300 (ServeRAID-5i only)	Install ServeRAID-5i controller in an extended PCI expansion slot. See the documentation that came with the server for more information.
3E20 (ServeRAID-5i only)	<ol style="list-style-type: none">1. Remove the ServeRAID-5i controller from its slot and install it in the proper PCI option slot.2. Verify that the ServeRAID-5i controller is supported in this server.3. ServeRAID-5i controller.4. System board.
3E2x	<ol style="list-style-type: none">1. Reseat the ServeRAID controller.2. Flash latest level of BIOS code and firmware for controller.3. ServeRAID-5i controller.4. Integrated RAID controller on serve).
4xxx thru 5xxx (Code DRAM error)	<ol style="list-style-type: none">1. Install download jumpers, flash latest level BIOS code and firmware for controller; then, remove jumpers.2. ServeRAID controller.
6xxx (Cache DRAM error) (ServeRAID-4H only)	<ol style="list-style-type: none">1. Reseat daughter card.2. Install download jumpers, flash latest level BIOS code and firmware for controller; then, remove jumpers.3. ServeRAID controller.

Note: See Chapter 7, “Parts listing xSeries 306 Type 1878, 8489 and 8836,” on page 75 to determine which components are replaceable by the customer, and which components must be replaced by a field service technician.

Error code/symptom	FRU/action
7xxx thru 8xxx (Host/local PCI bus interface error)	<ol style="list-style-type: none"> 1. Flash latest level of BIOS code and firmware for controller. 2. If ServeRAID-4x controller, replace controller. 3. If ServeRAID-5i controller, integrated RAID controller on the server.
9003	<ol style="list-style-type: none"> 1. Flash latest level of BIOS code and firmware for controller. 2. Confirm that this controller is a supported option for this system. 3. ServeRAID controller. 4. Integrated RAID controller on the server).
9xxx thru BZxx (SCSI bus error caused by cables, termination, defective drives, etc.). Z refers to the specific channel or channels that cause the error.	<ol style="list-style-type: none"> 1. Follow indications at “POST (ISPR) error procedures.” Follow those instructions before continuing with the next steps listed in this index. 2. SCSI cable. 3. SCSI backplane. 4. Hard disk drive. 5. ServeRAID controller.
EFFE (Firmware code corrupt or download jumpers are in place)	<ol style="list-style-type: none"> 1. Flash latest level BIOS and firmware for controller; then, remove jumpers. 2. ServeRAID controller.
FFFF or other code not listed	<ol style="list-style-type: none"> 1. Follow instructions at “POST (ISPR) error procedures.” 2. SCSI cable. 3. SCSI backplane. 4. Hard disk drive. 5. ServeRAID controller.

POST (ISPR) error procedures

Use the ISPR error procedures to help you solve ServeRAID problems. A complete list of error codes is listed at “ServeRAID error codes” on page 68.

Note: Where the ISPR error procedures refer to a SCSI backplane, see the chapter of this publication that concerns service replaceable units.

EF10 (Default ISPR)

1. No ISPR error present.

9Zxx thru BZxx (SCSI bus error caused by cables, termination, defective drives, or similar problem)

1. Isolate between SCSI subsystem and controller by disconnecting all SCSI cables from suspect card, and restart.

Attention: Do not press F5. Doing so changes the server configuration.

If an ISPR error is still present, perform the following actions until the error is no longer present:

- a. Reseat the controller
- b. Replace the controller

Notes:

- a. SCSI channel cable details, if any, appear elsewhere in this publication.
- b. The adapter/controller detects a configuration change. *Do not* select **Save Changes**. Instead, press F10 to bypass any options to this effect.

2. If ISPR error is **EF10** after disconnecting cables:

- a. Identify which channel is causing the error by the second digit (Z) of the original ISPR code as indicated in the following table.

Note: ServeRAID-4H controllers have 4 channels; ServeRAID-4L and -4Lx controllers have only one channel; and ServeRAID-4M and -4Mx controllers have 2 channels. ServeRAID-5i controllers have no channels. The ServeRAID-5i uses the channel connectors of the onboard integrated SCSI controller.

Table 2. SCSI identifier

SCSI Channel Code (z)	Descriptions
1	Channel 1
2	Channel 2
3	Channel 1 and 2
4	Channel 3
5	Channel 1 and 3
6	Channel 2 and 3
7	Channel 1, 2, and 3
8	Channel 4
9	Channel 1 and 4
A	Channel 2 and 4
B	Channel 1, 2, and 4
C	Channel 3 and 4
D	Channel 1, 3, and 4
E	Channel 2, 3, and 4
F	Channel 1, 2, 3, and 4

- b. Confirm that the channels identified from the error in step 2a are the cause of the error by verifying that the error presents itself *only* when the offending channel is reconnected.

- c. Check termination of identified channel.

Note: SCSI channel termination details, if any, appear elsewhere in this publication.

- d. Check for proper backplane jumper configuration.

Note: SCSI channel jumper details, if any, appear elsewhere in this publication.

- e. Check for proper cabling configuration in systems that use DASD status cables. Reconnect all cables removed in step 1 on page 70.
- f. Disconnect one drive at a time attached to the channel identified in step 2a on page 70; then, restart to determine which drive is causing the error.
- g. Replace SCSI cable.
- h. Replace SCSI backplane.

FFFF or other code not listed

1. Place download jumpers on the controller and try to flash the firmware code to the card.
2. Isolate between SCSI subsystem and controller by disconnecting all SCSI cables attached to the suspect card, and restart.

Attention: Do not press F5. Doing so changes the server configuration.

If ISPR code is **EF10** after disconnecting cables, follow these steps until the error is eliminated:

- a. Identify which channel is causing the error by reconnecting cables one at a time and restarting until the error returns.
- b. Check termination of identified channel in step 2a.

Note: SCSI channel termination details, if any, appear elsewhere in this publication.

- c. Disconnect one drive at a time attached to channel identified in step 2a and restart each time to determine which drive is causing the problem.
- d. Replace SCSI cable attached to channel identified in step 2a.
- e. Replace backplane attached to channel identified in step 2a.
3. If original ISPR code is still present after disconnecting all SCSI cables and restarting, perform the following actions until the error is no longer present:
 - Reseat the controller
 - Replace the controller

SCSI error codes

Error code	FRU/action
<p>All SCSI Errors One or more of the following might be causing the problem:</p> <ul style="list-style-type: none"> • A failing SCSI device (adapter, drive, controller) • An improper SCSI configuration or SCSI termination jumper setting • Duplicate SCSI IDs in the same SCSI chain • A missing or improperly installed SCSI terminator • A defective SCSI terminator • An improperly installed cable • A defective cable 	<ol style="list-style-type: none"> 1. External SCSI devices must be turned on before you turn on the server. 2. Make sure that the cables for all external SCSI devices are connected correctly. 3. If you have attached an external SCSI device to the server, make sure the external SCSI termination is set to automatic. 4. Make sure that the last device in each SCSI chain is terminated correctly. 5. Make sure that the SCSI devices are configured correctly.

ServerGuide problems

The following table lists problem symptoms and suggested solutions.

Table 3. ServerGuide Setup and Installation CD

Symptom	Suggested action
The <i>ServerGuide Setup and Installation</i> CD will not start.	<ul style="list-style-type: none"> • Make sure that the server supports the ServerGuide program and has a startable (bootable) CD-ROM (or DVD-ROM) drive. • If the startup (boot) sequence settings have been altered, make sure that the CD-ROM drive is first in the startup sequence. • If more than one CD-ROM drive is installed, ensure that only one drive is set as the primary drive. Start the CD from the primary drive.
The SCSI RAID program cannot view all installed drives, or the operating system cannot be installed.	<ul style="list-style-type: none"> • Make sure that there are no duplicate SCSI IDs or IRQ assignments. • Make sure that the hard disk drive is connected correctly.
The operating-system installation program continuously loops.	Make more space available on the hard disk.
The ServerGuide program will not start the operating-system CD.	Make sure that the operating-system CD is supported by the ServerGuide program. See the <i>ServerGuide Setup and Installation</i> CD label for a list of operating-system versions that support the ServerGuide program.
The operating system cannot be installed; the option is not available.	Make sure that the operating system is supported on your server. If the operating system is supported, either there is no logical drive defined (SCSI RAID systems) or the ServerGuide System Partition is not present. Run the ServerGuide program and make sure that setup is complete.

Undetermined problems

Use the information in this section if the diagnostic tests did not diagnose the failure, the devices list is incorrect, or the server is inoperative.

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, use the CMOS recovery jumper to override the power-on password and clear the CMOS memory; see “Erasing a lost or forgotten password (clearing CMOS memory)” on page 25. If you suspect that the BIOS code is damaged, see “Updating BIOS code” on page 23.

Check the LEDs on all the power supplies. If the LEDs indicate the power supplies are working correctly, complete the following steps:

1. Turn off the server.
2. Make sure that the server is cabled correctly.
3. Remove or disconnect the following devices (one at a time) until you find the failure (turn on the server and reconfigure each time):
 - Any external devices
 - Surge suppressor device (on the server)
 - Modem, printer, mouse, or non-IBM devices
 - Each adapter
 - Drives
 - Memory modules (minimum requirement = two 512 MB DIMMs)

Note: Minimum operating requirements are:

- a. Power supply
- b. System board
- c. One microprocessor
- d. Memory (with a minimum of two 512 MB DIMMs)
4. Turn on the server. If the problem remains, suspect the following FRUs in the order listed:
 - Power supply
 - System board

Notes:

1. If the problem goes away when you remove an adapter from the system and replacing that adapter does not correct the problem, suspect the system board.
2. If you suspect a networking problem and all the system tests pass, suspect a network cabling problem external to the system.

Problem determination tips

Because of the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Microprocessor or hard disk upgrades
- Failure symptom
 - Do diagnostics fail?
 - What message appears in the diagnostics log?
 - What, when, where, single, or multiple servers?
 - Is the failure repeatable?
 - Has this configuration ever worked?
 - If it has been working, what changes were made before it failed?
 - Is this the original reported failure?
- Diagnostics version
 - Type and version level
- Hardware configuration
 - Print (print screen) configuration currently in use
 - BIOS level
- Operating system software
 - Type and version level

Note: To eliminate confusion, identical systems are considered identical only if they:

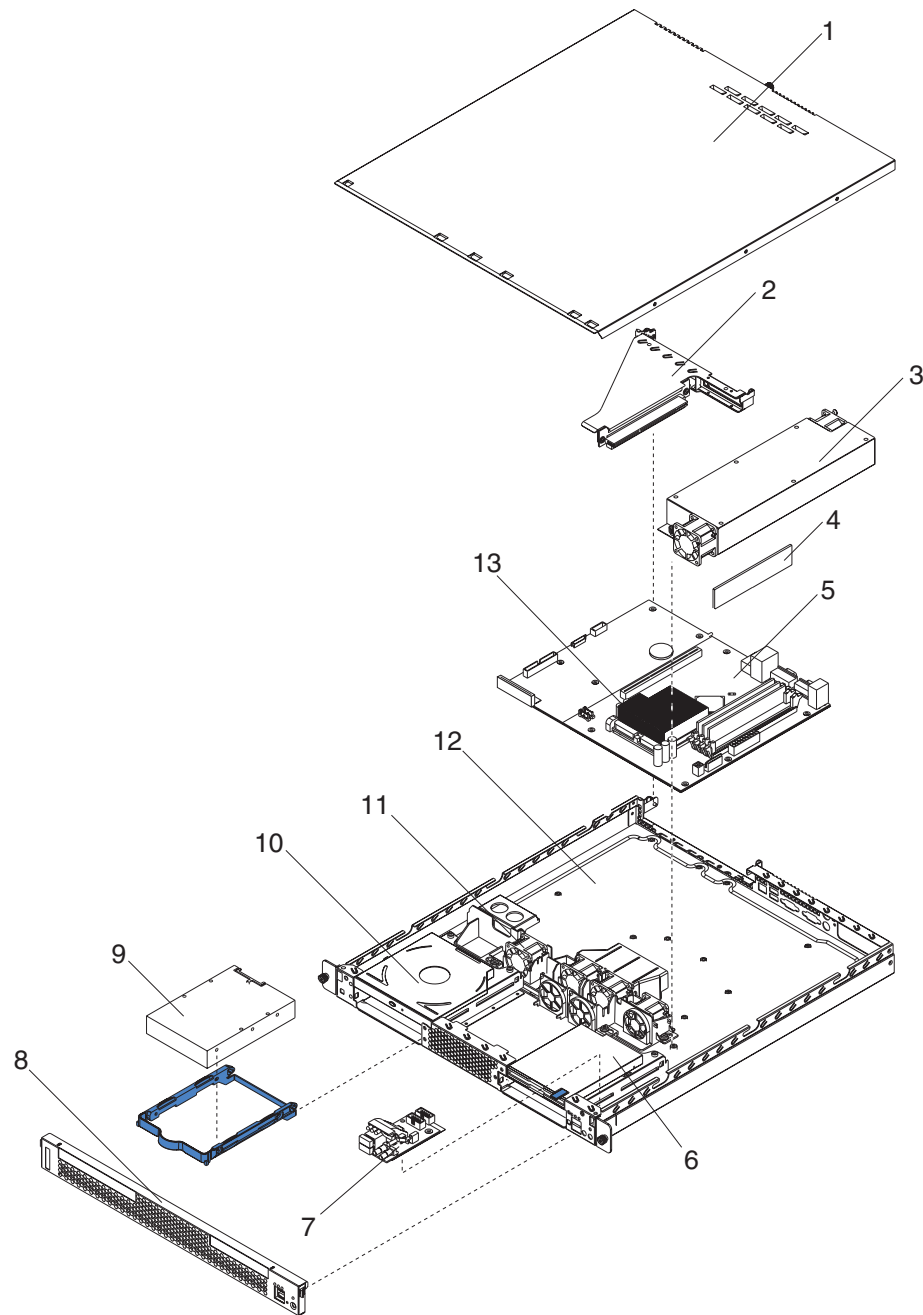
- Are the exact machine type and models
- Have the same BIOS level
- Have the same adapters/attachments in the same locations
- Have the same address jumpers/terminators/cabling
- Have the same software versions and levels
- Have the same diagnostics code (version)
- Have the same configuration options set in the system
- Have the same setup for the operation system control files

Comparing the configuration and software setup between working and non-working servers will often lead to problem resolution.

Chapter 7. Parts listing xSeries 306 Type 1878, 8489 and 8836

This parts listing supports the xSeries 306 Type 1878, 8489 and 8836. To check for an updated parts listing on the Web, complete the following steps:

1. Go to <http://www.ibm.com/support>.
2. Under **Search technical support**, type 1878, 8489, or 8836 and click **Search**.
3. Under Document type, select **Parts information** and click **Go**.



Server

Note: Field replaceable units (FRUs) must be serviced only by qualified field service technicians. Customer replaceable units (CRUs) can be replaced by the customer.

Index	Server (xSeries 306, Type 1878, 8489, and 8836)	FRU No.	CRU/FRU
1	Top cover (all models)	26K4157	CRU
2	PCI-X riser card (all models)	26K3052	FRU
3	Power supply, 300 watt (all models)	26K4106	FRU
4	Memory, 512 PC 2700 ECC (all models)	06P4061	CRU
4	Memory, 512 PC 3200 ECC (models 31x, 35x, 41x, 45x, 99x)	06P4057	CRU
4	Memory, 256 PC 3200 ECC (option, all models)	06P4056	CRU
4	Memory, 1 GB PC 3200 ECC (option, all models)	06P4058	CRU
4	Memory, 1 GB PC 2700 ECC (option, all models)	06P4062	CRU
5	System board (all models)	13M8136	FRU
6	Diskette drive, 12.7 black (primary, all models)	39M0105	CRU
6	Diskette drive, 12.7 black (alternate, all models)	36L8645	CRU
7	LED board (all models)	26K4107	CRU
8	Front bezel assembly (all models)	26K4115	CRU
9	Hard disk drive, 36.4 GB SCSI (8836 models 11x, 21x, 31x, 41x)	24P3704	CRU
9	Hard disk drive, 36.4 GB SCSI (option, all models)	24P3725	CRU
9	Hard disk drive, 73.4 GB SCSI (model 99x) (option all models)	24P3706	CRU
9	Hard disk drive, 73.4 GB SCSI (option, all models)	24P3727	CRU
9	Hard disk drive, 80 GB SCSI (option, all models)	73P8000	CRU
9	Hard disk drive, 160 GB SCSI (option, all models)	73P8001	CRU
9	Hard disk drive, 146.8 GB SCSI (option, all models)	24P3708	CRU
9	Hard disk drive, 160 GB SATA (option, all models)	71P7297	CRU
10	CD-ROM drive, 24X (primary, all models)	39M3505	CRU
10	CD-ROM drive, 24X (alternate, all models)	33P3231	CRU
10	CD-ROM drive, 24X (alternate, all models)	26K5423	CRU
10	CD-RW/DVD drive (option, all models)	71P7359	CRU
10	CD-RW drive, slim (option, all models)	26K5439	CRU
10	DVD drive (option, all models)	39M3531	CRU
10	DVD drive, 12.7 mm (option, all models)	39M3525	CRU
11	Fan assembly, 40 mm (all models)	26K4281	CRU
12	Chassis (all models)	39Y8997	FRU
13	Heat sink, microprocessor	26K4116	FRU
	Air baffle (all models)	26K4113	CRU
	Battery, 3.0 volt lithium	33F8354	FRU
	Bracket, SATA (models 15x, 25x, 35x, 45x)	26K4130	CRU
	Cable, diskette drive (all models)	26K4110	CRU
	CD-ROM adapter (all models)	26K4150	FRU
	Cable, IDE (all models)	26K4111	CRU
	Cable, panel mount (models 15x, 25x, 35x, 45x)	13N2413	CRU
	Cable, SCSI signal (models 11x, 21x, 31x, 41x, 99x)	26K4118	CRU
	Cable, USB and LED (all models)	26K4109	FRU
	Fan bracket (all models)	26K4148	CRU
	Heat sink retention module (all models)	24P4811	CRU
	Kit, 1U toolless (all models)	24P1121	FRU
	LED board (all models)	26K4107	CRU
	Microprocessor, 2.8 GHz (8836 models 11x, 15x)	02R8743	FRU
	Microprocessor, 3.0 GHz (8836 models 21x, 25x)	02R8742	FRU
	Microprocessor, 3.2 GHz (1878 model 99x; 8836 models 31x, 35x)	02R8741	FRU
	Microprocessor, 3.2 GHz (models 41x, 45x)	26K8430	FRU

Index	Server (xSeries 306, Type 1878, 8489, and 8836)	FRU No.	CRU/FRU
	Miscellaneous parts kit (all models)	26K4131	FRU
	• Bezel, blank (1)		
	• Bezel, diskette drive blank (1)		
	• Bezel, PCI blank (2)		
	• Heat sink (1)		
	• Screw, M 3x4 flat (4)		
	• Screw, M 3x5 pan (10)		
	• Screw, M 3.5x6 (4)		
	• Screw, M 3.5 steel (6)		
	• Screw, M 3x5 slotted (2)		
	• Screw, M 4x10 flat (2)		
	• Screw, M 4x5 pan (4)		
	• Spring, CD (2)		
	• Spring, diskette drive (2)		
	Power cord; see "Power cords" on page 78. (all models)	6952300	CRU
	SATA RAID card, 4-port (option, all models)	71P8650	CRU
	Riser card assembly (all models)	26K4149	FRU
	SCSI adapter (models 11x, 21x, 31x, 41x, 99x)	26K3051	CRU
	System service label (all models)	26K4158	FRU

Keyboard CRUs

Keyboard	CRU No.
US English	83P8300
Arabic	83P8301
Belgium/French	83P8302
Belgium/UK	83P8303
Brazil/Portuguese	83P8304
Bulgarian	83P8305
Chinese/US	83P8306
Czech	83P8307
Danish	83P8308
Dutch	83P8309
French	83P8310
French Canadian (445)	83P8311
French Canadian (058)	83P8312
German	83P8313
Greek	83P8314
Hebrew	83P8315
Hungarian	83P8316
Iceland	83P8317
Italy	83P8319
Japanese	83P8320
Korean	83P8321
LA Spanish	83P8322
Norwegian	83P8323
Polish	83P8324
Portuguese	83P8325
Romanian	83P8326
Russian	83P8327
Serbian/Cyrillic	83P8328

Keyboard	CRU No.
Slovic	83P8329
Spanish	83P8330
Swedish/Finn	83P8331
Swiss, F/G	83P8332
Thailand	83P8333
Turkish (440)	83P8334
Turkish (179)	83P8335
UK English	83P8336
US English-EMEA	83P8337
Yugoslav/Lat	83P8338

Power cords

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

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

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

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

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

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

IBM power cord part number	Used in these countries and regions
13F9940	Argentina, Australia, China (PRC), New Zealand, Papua New Guinea, Paraguay, Uruguay, Western Samoa
13F9979	Afghanistan, Algeria, Andorra, Angola, Austria, Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, China (Macau S.A.R.), Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Malagasy, Mali, Martinique, Mauritania, Mauritius, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Romania, Senegal, Slovakia, Spain, Sudan, Sweden, Syria, Togo, Tunisia, Turkey, former USSR, Vietnam, former Yugoslavia, Zaire, Zimbabwe
13F9997	Denmark
14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka

IBM power cord part number	Used in these countries and regions
14F0033	Antigua, Bahrain, Brunei, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dubai, Fiji, Ghana, India, Iraq, Ireland, Kenya, Kuwait, Malawi, Malaysia, Malta, Nepal, Nigeria, Polynesia, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Kingdom, Yemen, Zambia
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Ethiopia, Italy, Libya, Somalia
14F0087	Israel
1838574	Thailand
6952300	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), United States of America, Venezuela

Appendix A. Getting help and technical assistance

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

Before you call

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

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

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

Using the documentation

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

Getting help and information from the World Wide Web

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

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

Software service and support

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

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

Hardware service and support

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

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

Appendix B. Safety information

Note: The service procedures are designed to help you isolate problems. They are written with the assumption that you have model-specific training on all computers, or that you are familiar with the computers, functions, terminology, and service information provided in this manual.

The following section contains the safety information that you need to be familiar with before servicing an IBM computer.

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
 1. Ensure you can stand safely without slipping.
 2. Distribute the weight of the object equally between your feet.
 3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
 4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

Remember: Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

Electrical safety



CAUTION:

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the server covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

Important: Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
 - Performing a mechanical inspection
 - Working near power supplies
 - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
 - Ensure that another person, familiar with the power-off controls, is near you.
Remember: Another person must be there to switch off the power, if necessary.
 - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.
Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
 - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
 - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
 - Power supply units
 - Pumps
 - Blowers and fans
 - Motor generators
 and similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
 - Use caution; do not become a victim yourself.
 - Switch off power.
 - Send another person to get medical aid.

Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Turn off the computer. Disconnect the power cord.
3. Check the power cord for:
 - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.

- b. The power cord should be the appropriate type as specified in the parts listings.
- c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the server, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD-protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those in the following list, to provide protection that meets the specific service requirement.

Note: The use of a grounding system is desirable but not required to protect against ESD damage.

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
- Use the round ground-prong of the AC plug on AC-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Safety notices (multi-lingual translations)

The caution and danger safety notices in this section are provided in the following languages:

- English
- Brazilian/Portuguese
- Chinese
- French
- German
- Italian
- Japanese
- Korean
- Spanish

Important: All caution and danger statements in this IBM 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 this section.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in this section under statement 1.

Be sure to read all caution and danger statements before performing any of the instructions.

Statement 1



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
<ol style="list-style-type: none">1. Turn everything OFF.2. First, attach all cables to devices.3. Attach signal cables to connectors.4. Attach power cords to outlet.5. Turn device ON.	<ol style="list-style-type: none">1. Turn everything OFF.2. First, remove power cords from outlet.3. Remove signal cables from connectors.4. Remove all cables from devices.

Statement 2



CAUTION:

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

Do not:

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

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

Statement 3



CAUTION:

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

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

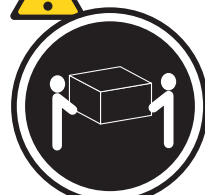


DANGER

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

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

Statement 4



≥18 kg (39.7 lb)



≥32 kg (70.5 lb)



≥55 kg (121.2 lb)

CAUTION:

Use safe practices when lifting.

Statement 5



CAUTION:

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



Statement 10

CAUTION:

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



Statement 20



CAUTION:

To avoid personal injury, before lifting the unit, remove all the blades to reduce the weight.

Statement 21



CAUTION:

**Hazardous energy is present when the blade server is connected to the power source.
Always replace the blade cover before installing the blade server.**

Importante:

Todas as instruções de cuidado e perigo da IBM documentation começam com um número. Este número é utilizado para fazer referência cruzada de uma instrução de cuidado ou perigo no idioma inglês com as versões traduzidas das instruções de cuidado ou perigo encontradas nesta seção.

Por exemplo, se uma instrução de cuidado é iniciada com o número 1, as traduções para aquela instrução de cuidado aparecem nesta seção sob a instrução 1.

Certifique-se de ler todas as instruções de cuidado e perigo antes de executar qualquer operação.

Instrução 1



A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicações é perigosa.

Para evitar risco de choque:

- Não conecte ou desconecte cabos e não realize instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.
- Conecte todos os cabos de alimentação a tomadas elétricas corretamente instaladas e aterradas.
- Conecte todos os equipamentos ao qual esse produto será conectado a tomadas corretamente instaladas.
- Sempre que possível, utilize apenas uma das mãos para conectar ou desconectar cabos de sinal.
- Nunca ligue qualquer equipamento quando existir evidência de danos por fogo, água ou na estrutura.
- Desconecte cabos de alimentação, sistemas de telecomunicação, redes e modems antes de abrir as tampas dos dispositivos, a menos que especificado de maneira diferente nos procedimentos de instalação e configuração.
- Conecte e desconecte cabos conforme descrito na seguinte tabela, ao instalar ou movimentar este produto ou os dispositivos conectados, ou ao abrir suas tampas.

Para Conectar:	Para Desconectar:
<ol style="list-style-type: none">1. DESLIGUE Tudo.2. Primeiramente, conecte todos os cabos aos dispositivos.3. Conecte os cabos de sinal aos conectores.4. Conecte os cabos de alimentação às tomadas.5. LIGUE os dispositivos.	<ol style="list-style-type: none">1. DESLIGUE Tudo.2. Primeiramente, remova os cabos de alimentação das tomadas.3. Remova os cabos de sinal dos conectores.4. Remova todos os cabos dos dispositivos.

Instrução 2



CUIDADO:

Ao substituir a bateria de lítio, utilize apenas uma bateria IBM, Número de Peça 33F8354 ou uma bateria de tipo equivalente, recomendada pelo fabricante. Se o seu sistema possui um módulo com uma bateria de lítio, substitua-o apenas pelo mesmo tipo de módulo, do mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada e descartada de maneira correta.

Não:

- Jogue ou coloque na água
- Aqueça a mais de 100°C (212°F)
- Conserte nem desmonte

Para descartar a bateria, entre em contato com a área de atendimento a clientes IBM, pelo telefone (011) 889-8986, para obter informações sobre como enviar a bateria pelo correio para a IBM.

Instrução 3



PRECAUCIÓN:

Quando produtos a laser (unidades de CD-ROM, unidades de DVD, dispositivos de fibra ótica, transmissores, etc.) estiverem instalados, observe o seguinte:

- Não remova as tampas. A remoção das tampas de um produto a laser pode resultar em exposição prejudicial à radiação de laser. Nenhuma peça localizada no interior do dispositivo pode ser consertada.
- A utilização de controles ou ajustes ou a execução de procedimentos diferentes dos especificados aqui pode resultar em exposição prejudicial à radiação.

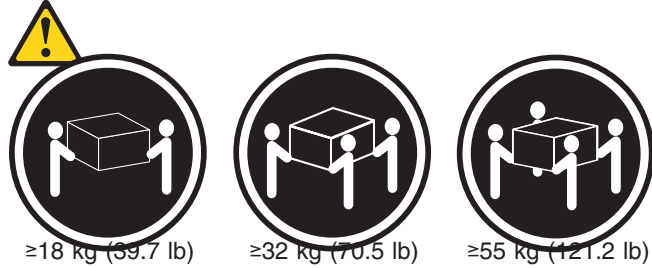


PERIGO

Alguns produtos a laser contêm um diodo laser da Classe 3A ou Classe 3B embutido. Observe o seguinte:

Radiação de laser quando aberto. Não olhe diretamente para o raio a olho nu ou com instrumentos óticos, e evite exposição direta ao raio.

Instrução 4



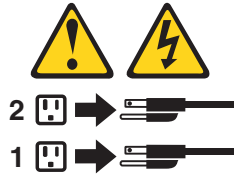
CUIDADO:

Ao levantar a máquina, faça-o com segurança.

Instrução 5



Os botões Liga/Desliga localizados no dispositivo e na fonte de alimentação não desligam a corrente elétrica fornecida ao dispositivo. O dispositivo também pode ter mais de um cabo de alimentação. Para remover toda a corrente elétrica do dispositivo, assegure que todos os cabos de alimentação estejam desconectados da fonte de energia elétrica.



Instrução 10

CUIDADO:

Não coloque nenhum objeto com peso superior a 82 kg (180 lbs.) sobre dispositivos montados em rack.



Instrução 20



Para prevenir acidentes, antes de erguer a unidade, remova todas as lâminas para reduzir o peso.

Instrução 21



A energia é uma ameaça quando a lâmina estiver conectada à fonte de alimentação. Sempre substitua a cobertura da lâmina antes de efetuar a instalação.

重要:

Server Library 中的所有提醒和危险条款前都有一个数字标识。该数字是用来交叉引用一个英文的提醒和危险条款及本部分中的与之对应的已翻译成其它文字的提醒和危险条款。

例如，如果一个提醒条款前的数字为 1，则本部分中相应的译文也带有标号 1。

在执行任何指示的操作之前，请确保您已经阅读了全部提醒和危险条款。

声明 1



危险

电源、电话和通信电缆中带有危险电流。
为避免电击：
雷电期间不要拆接电缆或安装、维修及重新配置本产品。
将所有电源线连接至正确布线并已安全接地的电源插座上。
将与本产品连接的所有设备连接至正确布线的插座上。
尽量只使用单手拆接信号电缆。
有水、火及结构损坏迹象时，请勿打开任何设备。
除非在安装配置过程中有明确指示，否则，打开设备机盖前应先断开与电源线、远程通信系统、网络和调制解调器的所有连接。
安装、移动或打开本产品及其附带设备的机盖时，应按下表所述连接和断开电缆。

连接时:	断开连接时:
1. 关闭所有设备。	1. 关闭所有设备。
2. 首先将所有电缆连接至设备。	2. 首先从插座中拔出电源线。
3. 将信号电缆连接至接口。	3. 从接口上拔下信号电缆。
4. 将电源线连接至插座。	

声明 2



警告:

更换锂电池时, 只能使用 IBM 产品号 33F8354 或者是厂商推荐的等同类型的电池。

如果系统模块中含有锂电池, 则只能使用同一厂商制造的同一类型的模块进行更换。电池中含有锂, 如果使用、拿放或处理不当, 可能会发生爆炸。

请勿对电池进行下列操作:
扔入或浸入水中。
加热超过 100 (212 F)
进行修理或分解
请按本地法规要求处理电池。

声明 3



警告:

安装激光产品 (如 CD-ROM、DVD 驱动器、光纤设备或送话器) 时, 应注意以下事项:

不要拆除外盖。拆除激光产品的外盖可能会导致激光辐射的危险, 本设备中没有用户可维修的部件。

非此处指定的其它控制、调整或与性能有关的操作都有可能产生激光辐射的危险。



危险

某些激光产品中包含内嵌的 3A 级或 3B 级激光二极管。请注意以下事项。

打开时会产生激光辐射。不要直视光束, 不要使用光学仪器直接观看光束, 避免直接暴露于光束之下。

声明 4



≥18 kg (37 磅)



≥32 kg (70.5 磅)



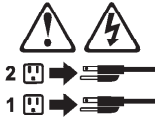
≥55 kg (121.2 磅)

警告:
抬起时请采用安全操作方法。

声明 5



警告:
使用设备上的电源控制按钮和电源上的开关都不能断开本设备上的电流。
另外，本设备可能带有多条电源线。若要断开设备上的所有电流，请确
保所有电源线均已与电源断开连接。



声明 6



警告:
如果在电源线连接设备的一端安装了固定松紧夹，则必须将电源线的另一端连接至
使用方便的电源。

声明 7



警告:

如果设备带有外门，则在移动或抬起设备前应将其拆除或固定以避免造成人员伤害。外门支撑不了设备的重量。

声明 8



警告:

不要拆除电源外盖或贴有下列标签的任何部件。



贴有此标签的组件内部存在高电压、高电流的危险。这些组件中没有用户可维修的部件。如果怀疑其中的部件存在问题，应与服务技术人员联系。

声明 9



警告:

为避免人员伤害，拆除设备上的风扇前应按下热插拔风扇电缆。

声明 10



警告:

机柜安装的设备上面不能放置重于 82kg (180 磅) 的物品。



> 82 kg (180 磅)

声明 11



警告:

下面的标签表明附近有锋利的边、角或接头。



声明 12



警告:

下面的标签表明附近有高热表面。



• 声明 20



警告:

为避免人身伤害，请在抬起设备之前卸下所有刀片服务器以减轻重量。

• 声明 21



警告:

当刀片服务器连接到电源时会有危险的能量，请始终在安装刀片服务器之前重新装上刀片服务器机盖。

重要資訊：

Server Library 中所有「注意」及「危險」的聲明均以數字開始。此一數字是用來作為交互參考之用，英文「注意」或「危險」聲明可在本節中找到相同內容的「注意」或「危險」聲明的譯文。

例如，有一「危險」聲明以數字 1 開始，則該「危險」聲明的譯文將出現在本節的「聲明」1 中。

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

聲明 1



危險

電源、電話及通信電纜上所產生的電流均有危險性。

欲避免電擊危險：

- 在雷雨期間，請勿連接或切斷本產品上的任何電纜線，或安裝、維修及重新架構本產品。
- 請將電源線接至接線及接地正確的電源插座。
- 請將本產品隨附的設備連接至接線正確的插座。
- 儘可能使用單手來連接或切斷信號電纜線。
- 當設備有火燒或泡水的痕跡，或有結構性損害時，請勿開啓該設備的電源。
- 在安裝及裝機之時，若非非常熟悉，在開啓裝置蓋子之前，請切斷電源線、電信系統、網路及數據機。
- 在安裝、移動本產品或附加裝置，或開啓其蓋子時，請依照下表中「連接」及「切斷」電纜線的步驟執行。

連接：

1. 關閉所有開關。
2. 先將所有電纜線接上裝置。
3. 將信號電纜接上接頭。
4. 再將電源線接上電源插座。
5. 開啓裝置的電源。

切斷：

1. 關閉所有開關。
2. 先自電源插座拔掉電源線。
3. 拔掉接頭上的所有信號電纜。
4. 再拔掉裝置上的所有電纜線。

聲明 2



注意：

更換鋰電池時，只可使用 IBM 零件編號 33F8354 的電池，或製造商建議之相當類型的電池。若系統中具有包含鋰電池的模組，在更換此模組時，請使用相同廠商製造的相同模組類型。如未正確使用、處理或丟棄含有鋰的電池時，可能會引發爆炸。

請勿將電池：

- 丟入或浸入水中
- 加熱超過 100 °C (212 °F)
- 修理或拆開

請遵照當地法令規章處理廢棄電池。

聲明 3



注意：

安裝雷射產品(如 CD-ROM、DVD 光碟機、光纖裝置或發射器)時，請注意下列事項：

- 請勿移開蓋子。移開雷射產品的蓋子，您可能會暴露於危險的雷射輻射之下。裝置中沒有需要維修的組件。
- 不依此處所指示的控制、調整或處理步驟，您可能會暴露於危險的輻射之下。



危險

有些雷射產品含有內嵌式 Class 3A 或 Class 3B 雷射二極體。請注意下列事項：

開啓時會產生雷射輻射。請勿凝視光束，不要使用光學儀器直接觀察，且應避免直接暴露在光線下。

聲明 4



≥ 18 公斤 (37 磅)



≥ 32 公斤 (70.5 磅)



≥ 55 公斤 (121.2 磅)

注意：

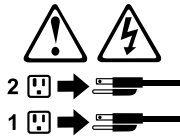
抬起裝置時，請注意安全措施。

聲明 5



注意：

裝置上的電源控制按鈕及電源供應器上的電源開關均無法關閉裝置上的電流。
本裝置可能有一條以上的電源線。如要移除裝置上的所有電流，請確認所有電源線已與電源分離。



聲明 10



注意：

請勿將任何重量超過 82 公斤 (180 磅) 的物品置於已安裝機架的裝置上方。



> 82 公斤 (180 磅)

聲明 20



警告：

為了避免人身傷害，抬起裝置之前，請先卸下所有的螺旋槳，以便減輕重量。

聲明 21



警告：

當螺旋槳連到電源時可能有危險之虞。安裝螺旋槳之前，請先更換螺旋槳外蓋。

Important:

Toutes les consignes Attention et Danger indiquées dans la bibliothèque IBM documentation sont précédées d'un numéro. Ce dernier permet de mettre en correspondance la consigne en anglais avec ses versions traduites dans la présente section.

Par exemple, si une consigne de type Attention est précédée du chiffre 1, ses traductions sont également précédées du chiffre 1 dans la présente section.

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Notice n° 1



Le courant électrique passant dans les câbles de communication, ou les cordons téléphoniques et d'alimentation peut être dangereux.

Pour éviter tout risque de choc électrique:

- Ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.
- Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.
- Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.
- Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.
- Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.
- Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relient aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).
- Lorsque vous installez ou que vous déplacez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.

Connexion	Déconnexion
<ol style="list-style-type: none">1. Mettez les unités hors tension.2. Commencez par brancher tous les cordons sur les unités.3. Branchez les câbles d'interface sur des connecteurs.4. Branchez les cordons d'alimentation sur des prises.5. Mettez les unités sous tension.	<ol style="list-style-type: none">1. Mettez les unités hors tension.2. Débranchez les cordons d'alimentation des prises.3. Débranchez les câbles d'interface des connecteurs.4. Débranchez tous les câbles des unités.

Notice n° 2



ATTENTION:

Remplacez la pile au lithium usagée par une pile de référence identique exclusivement - voir la référence IBM - ou par une pile équivalente recommandée par le fabricant. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et présente donc un risque d'explosion en cas de mauvaise manipulation ou utilisation.

- Ne la jetez pas à l'eau.
- Ne l'exposez pas à une température supérieure à 100 °C.
- Ne cherchez pas à la réparer ou à la démonter.

Pour la mise au rebut, reportez-vous à la réglementation en vigueur.

Notice n° 3



ATTENTION:

Si des produits laser sont installés (tels que des unités de CD-ROM ou de DVD, des périphériques contenant des fibres optiques ou des émetteurs-récepteurs), prenez connaissance des informations suivantes:

- N'ouvrez pas ces produits pour éviter une exposition directe au rayon laser. Vous ne pouvez effectuer aucune opération de maintenance à l'intérieur.
- Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent document.

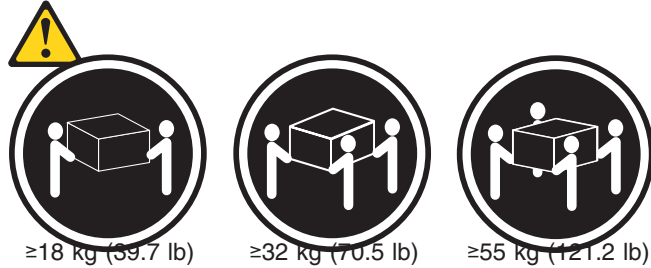


DANGER

Certains produits laser contiennent une diode laser de classe 3A ou 3B. Prenez connaissance des informations suivantes:

Rayonnement laser lorsque le carter est ouvert. évitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques. évitez une exposition directe au rayon.

Notice n° 4



ATTENTION:

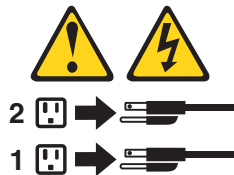
Faites-vous aider pour soulever ce produit.

Notice n° 5



ATTENTION:

Le bouton de mise sous tension/hors tension de l'unité et l'interrupteur d'alimentation du bloc d'alimentation ne coupent pas l'arrivée de courant électrique à l'intérieur de la machine. Il se peut que votre unité dispose de plusieurs cordons d'alimentation. Pour isoler totalement l'unité du réseau électrique, débranchez tous les cordons d'alimentation des socles de prise de courant.



Notice n° 10

ATTENTION:

Ne posez pas d'objet dont le poids dépasse 82 kg sur les unités montées en armoire.



Notice n° 20



ATTENTION:

Pour éviter tout risque de blessure, retirez tous les Serveurs lame de l'unité avant de la soulever.

Notice n° 21



ATTENTION:

Un courant électrique dangereux est présent lorsque le Serveur lame est connecté à une source d'alimentation. Remettez toujours en place le carter du Serveur lame avant d'installer le Serveur lame.

Wichtig:

Alle Sicherheitshinweise in dieser IBM documentation beginnen mit einer Nummer. Diese Nummer verweist auf einen englischen Sicherheitshinweis mit den übersetzten Versionen dieses Hinweises in diesem Abschnitt.

Wenn z. B. ein Sicherheitshinweis mit der Nummer 1 beginnt, so erscheint die Übersetzung für diesen Sicherheitshinweis in diesem Abschnitt unter dem Hinweis 1.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Hinweis 1



Elektrische Spannungen von Netz-, Telefon- und Datenübertragungsleitungen sind gefährlich.

Aus Sicherheitsgründen:

- Bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.
- Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Signalkabel möglichst einhändig anschließen oder lösen.
- Keine Geräte einschalten, wenn die Gefahr einer Beschädigung durch Feuer, Wasser oder andere Einflüsse besteht.
- Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem Öffnen des Gehäuses zu unterbrechen. Es sei denn, dies ist in den zugehörigen Installations- und Konfigurationsprozeduren anders angegeben.
- Nur nach den nachfolgend aufgeführten Anweisungen arbeiten, die für Installation, Transport oder Öffnen von Gehäusen von Personal Computern oder angeschlossenen Einheiten gelten.

Kabel anschließen:	Kabel lösen:
<ol style="list-style-type: none">1. Alle Geräte ausschalten und Netzstecker ziehen.2. Zuerst alle Kabel an Einheiten anschließen.3. Signalkabel an Anschlußbuchsen anschließen.4. Netzstecker an Steckdose anschließen.5. Gerät einschalten.	<ol style="list-style-type: none">1. Alle Geräte ausschalten.2. Zuerst Netzstecker von Steckdose lösen.3. Signalkabel von Anschlußbuchsen lösen.4. Alle Kabel von Einheiten lösen.

Hinweis 2



ACHTUNG:

Eine verbrauchte Batterie nur durch eine Batterie mit der IBM Teilenummer 33F8354 oder durch eine vom Hersteller empfohlene Batterie ersetzen. Wenn Ihr System ein Modul mit einer Lithium-Batterie enthält, ersetzen Sie es immer mit dem selben Modultyp vom selben Hersteller. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

Die Batterie nicht:

- mit Wasser in Berührung bringen.
- über 100 C erhitzen.
- reparieren oder zerlegen.

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.

Hinweis 3



ACHTUNG:

Wenn ein Laserprodukt (z. B. CD-ROM-Laufwerke, DVD-Laufwerke, Einheiten mit Glasfaserkabeln oder Transmitter) installiert ist, beachten Sie folgendes.

- Das Entfernen der Abdeckungen des CD-ROM-Laufwerks kann zu gefährlicher Laserstrahlung führen. Es befinden sich keine Teile innerhalb des CD-ROM-Laufwerks, die vom Benutzer gewartet werden müssen. Die Verkleidung des CD-ROM-Laufwerks nicht öffnen.
- Steuer- und Einstellelemente sowie Verfahren nur entsprechend den Anweisungen im vorliegenden Handbuch einsetzen. Andernfalls kann gefährliche Laserstrahlung auftreten.



VORSICHT

Manche CD-ROM-Laufwerke enthalten eine eingebaute Laserdiode der Klasse 3A oder 3B. Die nachfolgend aufgeführten Punkte beachten.

Laserstrahlung bei geöffneter Tür. Niemals direkt in den Laserstrahl sehen, nicht direkt mit optischen Instrumenten betrachten und den Strahlungsbereich meiden.

Hinweis 4



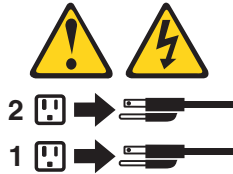
ACHTUNG:

Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

Hinweis 5



Mit dem Betriebsspannungsschalter an der Vorderseite des Servers und dem Betriebsspannungsschalter am Netzteil wird die Stromversorgung für den Server nicht unterbrochen. Der Server könnte auch mehr als ein Netzkabel aufweisen. Um die gesamte Stromversorgung des Servers auszuschalten, muß sichergestellt werden, daß alle Netzkabel aus den Netzsteckdosen herausgezogen wurden.



Hinweis 10

ACHTUNG:

Keine Gegenstände, die mehr als 82 kg wiegen, auf Rack-Einheiten ablegen.



Hinweis 20



Um Verletzungen zu vermeiden, entfernen Sie vor dem Anheben der Einheit zur Verringerung des Gewichts alle Blades.

Hinweis 21



Wenn das Blade an eine Stromquelle angeschlossen ist, besteht die Gefahr eines Stromschlags. Bringen Sie die Abdeckung der Blades immer an, bevor Sie sie installieren.

Importante:

Tutti gli avvisi di attenzione e di pericolo riportati nella pubblicazione IBM documentation iniziano con un numero. Questo numero viene utilizzato per confrontare avvisi di attenzione o di pericolo in inglese con le versioni tradotte riportate in questa sezione.

Ad esempio, se un avviso di attenzione inizia con il numero 1, la relativa versione tradotta è presente in questa sezione con la stessa numerazione.

Prima di eseguire una qualsiasi istruzione, accertarsi di leggere tutti gli avvisi di attenzione e di pericolo.

Avviso 1



La corrente elettrica circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa.

Per evitare il pericolo di scosse elettriche:

- Non collegare o scollegare i cavi, non effettuare l'installazione, la manutenzione o la riconfigurazione di questo prodotto durante i temporali.
- Collegare tutti i cavi di alimentazione ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Collegare qualsiasi apparecchiatura collegata a questo prodotto ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Quando possibile, collegare o scollegare i cavi di segnale con una sola mano.
- Non accendere qualsiasi apparecchiatura in presenza di fuoco, acqua o se sono presenti danni all'apparecchiatura stessa.
- Scollegare i cavi di alimentazione, i sistemi di telecomunicazioni, le reti e i modem prima di aprire i coperchi delle unità, se non diversamente indicato nelle procedure di installazione e configurazione.
- Collegare e scollegare i cavi come descritto nella seguente tabella quando si effettuano l'installazione, la rimozione o l'apertura dei coperchi di questo prodotto o delle unità collegate.

Per collegare:	Per scollegare:
<ol style="list-style-type: none">1. SPEGNERE tutti i dispositivi.2. Collegare prima tutti i cavi alle unità.3. Collegare i cavi di segnale ai connettori.4. Collegare i cavi di alimentazione alle prese elettriche.5. ACCENDERE le unità.	<ol style="list-style-type: none">1. SPEGNERE tutti i dispositivi.2. Rimuovere prima i cavi di alimentazione dalle prese elettriche.3. Rimuovere i cavi di segnale dai connettori.4. Rimuovere tutti i cavi dalle unità.

Avviso 2



ATTENZIONE:

Quando si sostituisce la batteria al litio, utilizzare solo una batteria IBM con numero parte 33F8354 o batterie dello stesso tipo o di tipo equivalente consigliate dal produttore. Se il sistema di cui si dispone è provvisto di un modulo contenente una batteria al litio, sostituire tale batteria solo con un tipo di modulo uguale a quello fornito dal produttore. La batteria contiene litio e può esplodere se utilizzata, maneggiata o smaltita impropriamente.

Evitare di:

- Gettarla o immergerla in acqua
- Riscaldarla ad una temperatura superiore ai 100°C
- Cercare di ripararla o smontarla

Smaltire secondo la normativa in vigore (D.Lgs 22 del 5/2/9) e successive disposizioni nazionali e locali.

Avviso 3



ATTENZIONE:

Quando si installano prodotti laser come, ad esempio, le unità DVD, CD-ROM, a fibre ottiche o trasmettitori, prestare attenzione a quanto segue:

- Non rimuovere i coperchi. L'apertura dei coperchi di prodotti laser può determinare l'esposizione a radiazioni laser pericolose. All'interno delle unità non vi sono parti su cui effettuare l'assistenza tecnica.
- L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.



PERICOLO

Alcuni prodotti laser contengono all'interno un diodo laser di Classe 3A o Classe 3B. Prestare attenzione a quanto segue:

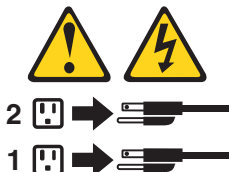
Aperto l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione diretta al fascio.

Avviso 5



ATTENZIONE:

Il pulsante del controllo dell'alimentazione situato sull'unità e l'interruttore di alimentazione posto sull'alimentatore non disattiva la corrente elettrica fornita all'unità. L'unità potrebbe disporre di più di un cavo di alimentazione. Per disattivare la corrente elettrica dall'unità, accertarsi che tutti i cavi di alimentazione siano scollegati dalla sorgente di alimentazione.



Avviso 10

ATTENZIONE:

Non poggiare oggetti che pesano più di 82 kg sulla parte superiore delle unità montate in rack.



Avviso 20



ATTENZIONE:

Per evitare incidenti, prima di sollevare l'unità, rimuovere tutte le lame in modo da ridurre il peso.

Avviso 21



ATTENZIONE:

Quando la lama è collegata alla sorgente elettrica è presente una tensione pericolosa. Sostituire sempre il coperchio della lama prima di installarla.

重要：

Neffinity Server ライブラリーにあるすべての注意および危険の記述は数字で始まります。この数字は、英語版の注意および危険の記述と翻訳された注意および危険の記述を相互参照するために使用します。

例えば、もし注意の記述が数字の1で始まっている場合は、その注意の翻訳は、記述1の下にあります。

手順を実施する前に、すべての注意：

・記述 1

危険

感電を防止するため、雷の発生時には、いかなるケーブルの取り付けまたは取り外しも行わないでください。また導入、保守、再構成などの作業も行わないでください。

感電を防止するため：

- 電源コードは正しく接地および配線が行われている電源に接続してください。
- 本製品が接続されるすべての装置もまた正しく配線された電源に接続されている必要があります。

できれば、信号ケーブルに取り付けまたは取り外しのときは片方の手のみで行うようにしてください。これにより、電位差がある二つの表面に触ることによる感電を防ぐことができます。

電源コード、電話ケーブル、通信ケーブルからの電流は身体に危険を及ぼします。設置、移動、または製品のカバーを開けたり装置を接続したりするときには、以下のようにケーブルの接続、取り外しを行ってください。

接続するには	取り外すには
1. すべての電源を切る	1. すべての電源を切る
2. まず、装置にすべてのケーブルを接続する。	2. まず、電源コンセントから電源コードを取り外す
3. 次に、通信ケーブルをコネクタに接続する	3. 次に、通信ケーブルをコネクタから取り外す。
4. その後、電源コンセントに電源コードを接続する	4. その後、装置からすべてのケーブルを取り外す
5. 装置の電源を入れる。	

・記述 2

⚠ 注意

本製品には、システム・ボード上にリチウム電池が使用されています。電池の交換方法や取り扱いを誤ると、発熱、発火、破裂のおそれがあります。

電池の交換には、IBM部品番号33F8354の電池またはメーカー推奨の同等の電池を使用してください。

交換用電池の購入については、お買い求めの販売店または弊社の営業担当までお問い合わせください。

電池は幼児の手の届かない所に置いてください。

万一、幼児が電池を飲み込んだときは、直ちに医師に相談してください。

以下の行為は絶対にしないでください。

- －水にぬらすこと
- －100度C以上の過熱や焼却
- －分解や充電
- －ショート

電池を廃棄する場合、および保存する場合にはテープなどで絶縁してください。他の金属や電池と混ざると発火、破裂の原因となります。電池は地方自治体の条例、または規則に従って廃棄してください。ごみ廃棄場で処分されるごみの中に捨てないでください。

・記述 3

⚠ 注意

レーザー製品（CD-ROM、DVD、または光ファイバー装置または送信器など）が組み込まれている場合は、下記に御注意ください。

- －ここに記載されている制御方法、調整方法、または性能を超えて使用すると、危険な放射線を浴びる可能性があります。
- －ドライブのカバーを開けると、危険な放射線を浴びる可能性があります。ドライブの内部に修理のために交換可能な部品はありません。カバーを開けないでください。

⚠ 危険

一部 CD-ROM ドライブは、Class 3A または Class 3B レーザー・ダイオードを使用しています。次の点に注意してください。

CD-ROMドライブのカバーを開けるとレーザーが放射されます。光線を見つめたり、光学器械を使って直接見たりしないでください。また直接光線を浴びないようにしてください。

・記述 4

⚠ 注意



18Kg 以上



32Kg 以上



55Kg 以上

装置を持ち上げる場合は、安全に持ち上げる方法に従ってください。

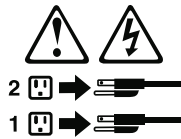
・記述 5

注意

サーバーの前面にある電源制御ボタンは、サーバーに供給された電流を遮断しません。

サーバーには、複数の電源コードが接続されているかもしれません。

サーバーから電流を完全に遮断するために、すべての電源コードが電源から取り外されていることを確認してください。



・記述 10

注意

ラック・モデルのサーバーの上に 82 Kg 以上の物を置かないでください。



▪ 記述 20



危険：

怪我を避けるため、ユニットを持ち上げる場合は、その前にすべてのブレード・サーバーを取り外して重量を軽くしてください。

▪ 記述 21



危険：

ブレード・サーバーを差し込んだ状態では感電する危険性があります。ブレードを差し込む前に、ブレードのカバーは必ず取り付けておいてください。

중요:

본 *Server Library*에 있는 모든 주의 및 위험 경고문은 번호로 시작합니다. 이 번호는 영문 주의 혹은 위험 경고문과 이 절에 나오는 번역된 버전의 주의 혹은 위험 경고문을 상호 참조하는 데 사용됩니다.

예를 들어, 주의 경고문이 번호 1로 시작하면, 번역된 해당 주의 경고문을 본 절의 경고문 1에서 찾아볼 수 있습니다.

모든 지시사항을 수행하기 전에 반드시 모든 주의 및 위험 경고문을 읽으십시오.

경고문 1



위험

전원, 전화 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다.

전기 충격을 피하려면:

- 뇌우를 동반할 때는 케이블의 연결이나 절수, 이 제품의 설치, 유지보수 또는 재구성을 하지 마십시오.
- 모든 전원 코드를 적절히 배선 및 접지해야 합니다.
- 이 제품에 연결될 모든 장비를 적절하게 배선된 콘센트에 연결하십시오.
- 가능한 한 신호 케이블을 한 손으로 연결하거나 끊으십시오.
- 화재, 수해 또는 구조상의 손상이 있을 경우 장비를 꺼지 마십시오.
- 설치 및 구성 프로시저에 다른 설명이 없는 한, 장치 덮개를 열기 전에 연결된 전원 코드, 원거리 통신 시스템, 네트워크 및 모뎀을 끊어 주십시오.
- 제품 또는 접속된 장치를 설치, 이동 및 덮개를 열 때 다음 설명에 따라 케이블을 연결하거나 끊도록 하십시오.

연결하려면:

1. 모든 스위치를 끕니다.
2. 먼저 모든 케이블을 장치에 연결합니다.
3. 신호 케이블을 커넥터에 연결합니다.
4. 콘센트에 전원 코드를 연결합니다.
5. 장치 스위치를 켭니다.

연결을 끊으려면:

1. 모든 스위치를 끕니다.
2. 먼저 콘센트에서 전원 코드를 뽑습니다.
3. 신호 케이블을 커넥터에서 제거합니다.
4. 장치에서 모든 케이블을 제거합니다.

경고문 2



주의:

리튬 배터리를 교체할 때는 IBM 부품 번호 33F8354 또는 제조업체에서 권장하는 동등한 유형의 배터리를 사용하십시오. 시스템에 리튬 배터리를 갖고 있는 모듈이 있으면 동일한 제조업체에서 생산된 동일한 모듈 유형으로 교체하십시오. 배터리에 리튬이 있을 경우 제대로 사용, 처리 또는 처분하지 않으면 폭발할 수 있습니다.

다음은 주의하십시오.

- 먼지거나 물에 닿지 않도록 하십시오.
- 100°C(212°F) 이상으로 가열하지 마십시오.
- 수리하거나 분해하지 마십시오.

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3



주의:
레이저 제품(CD-ROMs, DVD 드라이브, 광 장치 또는 트랜스미터 등과 같은)이 설치되어 있을 경우 다음을 주의하십시오.

- 덮개를 제거하지 마십시오. 레이저 제품의 덮개를 제거했을 경우 위험한 레이저 광선에 노출될 수 있습니다. 이 장치 안에는 서비스를 받을 수 있는 부품이 없습니다.

- 여기에서 지정하지 않은 방식의 제어, 조절 또는 실행으로 인해 위험한 레이저 광선에 노출될 수 있습니다.



위험

일부 레이저 제품에는 클래스 3A 또는 클래스 3B 레이저 다이오드가 들어 있습니다. 다음을 주의하십시오.

열면 레이저 광선에 노출됩니다. 광선을 주시하거나 광학 기계를 직접 쳐다보지 않도록 하고 광선에 노출되지 않도록 하십시오.

경고문 4



≥ 18 kg (37 lbs)



≥ 32 kg (70.5 lbs)



≥ 55 kg (121.2 lbs)

주의:

기계를 들 때는 안전하게 들어 올리십시오.

경고문 5



주의:
장치의 전원 제어 버튼 및 전원 공급기의 전원 스위치는 장치에 공급되는 전류를 차단하지 않습니다. 장치에 둘 이상의 전원 코드가 연결되어 있을 수도 있습니다. 장치에서 모든 전류를 차단하려면 모든 전원 코드가 전원으로부터 차단되어 있는지 확인하십시오.



경고문 10



주의:
서랍형 모델의 장치 상단에 82 kg(180 lbs.)이 넘는 물체를 올려 놓지 마십시오.



> 82 kg (180 lbs)

경고문 20



주의:
부품을 들어올리기 전에 모든 블레이드를 제거하여 무게를 줄여야 위험하지 않습니다.

경고문 21



주의:
블레이드를 전원에 연결할 때 감전 등의 위험이 있을 수 있습니다.
블레이드를 설치하기 전에 항상 블레이드 덮개를 교체하십시오.

Importante:

Todas las declaraciones de precaución de esta IBM documentation empiezan con un número. Dicho número se emplea para establecer una referencia cruzada de una declaración de precaución o peligro en inglés con las versiones traducidas que de dichas declaraciones pueden encontrarse en esta sección.

Por ejemplo, si una declaración de peligro empieza con el número 1, las traducciones de esta declaración de precaución aparecen en esta sección bajo Declaración 1.

Lea atentamente todas las declaraciones de precaución y peligro antes de llevar a cabo cualquier operación.

Declaración 1



La corriente eléctrica de los cables telefónicos, de alimentación y de comunicaciones es perjudicial.

Para evitar una descarga eléctrica:

- No conecte ni desconecte ningún cable ni realice las operaciones de instalación, mantenimiento o reconfiguración de este producto durante una tormenta.
- Conecte cada cable de alimentación a una toma de alimentación eléctrica con conexión a tierra y cableado correctos.
- Conecte a tomas de alimentación con un cableado correcto cualquier equipo que vaya a estar conectado a este producto.
- Si es posible, utilice una sola mano cuando conecte o desconecte los cables de sent.al.
- No encienda nunca un equipo cuando haya riesgos de incendio, de inundación o de daños estructurales.
- Desconecte los cables de alimentación, sistemas de telecomunicaciones, redes y módems conectados antes de abrir las cubiertas del dispositivo a menos que se indique lo contrario en los procedimientos de instalación y configuración.
- Conecte y desconecte los cables tal como se describe en la tabla siguiente cuando desee realizar una operación de instalación, de traslado o de apertura de las cubiertas para este producto o para los dispositivos conectados.

Para la conexión	Para la desconexión
<ol style="list-style-type: none">1. APÁGUELO todo.2. En primer lugar, conecte los cables a los dispositivos.3. Conecte los cables de señal a los conectores.4. Conecte cada cable de alimentación a la toma de alimentación.5. ENCIENDA el dispositivo.	<ol style="list-style-type: none">1. APÁGUELO todo.2. En primer lugar, retire cada cable de alimentación de la toma de alimentación.3. Retire los cables de señal de los conectores.4. Retire los cables de los dispositivos.

Declaración 2



PRECAUCIÓN:

Cuando desee sustituir la batería de litio, utilice únicamente el número de pieza 33F8354 de IBM o cualquier tipo de batería equivalente que recomiende el fabricante. Si el sistema tiene un módulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de módulo, que ha de estar creado por el mismo fabricante. La batería contiene litio y puede explotar si el usuario no la utiliza ni la maneja de forma adecuada o si no se desprende de la misma como corresponde.

No realice las acciones siguientes:

- Arrojarla al agua o sumergirla
- Calentarla a una temperatura que supere los 100°C (212°F)
- Repararla o desmontarla

Despréndase de la batería siguiendo los requisitos que exija el reglamento o la legislación local.

Declaración 3



PRECAUCIÓN:

Cuando instale productos láser (como, por ejemplo, CD-ROM, unidades DVD, dispositivos de fibra óptica o transmisores), tenga en cuenta las advertencias siguientes:

- No retire las cubiertas. Si retira las cubiertas del producto láser, puede quedar expuesto a radiación láser perjudicial. Dentro del dispositivo no existe ninguna pieza que requiera mantenimiento.
- El uso de controles o ajustes o la realización de procedimientos que no sean los que se han especificado aquí pueden dar como resultado una exposición perjudicial a las radiaciones.

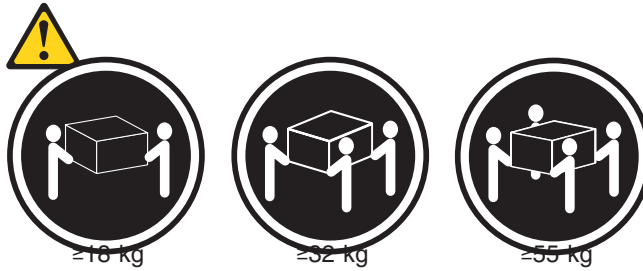


PELIGRO

Algunos productos láser contienen un diodo de láser incorporado de Clase 3A o de Clase 3B. Tenga en cuenta la advertencia siguiente.

Cuando se abre, hay radiación láser. No mire fijamente el rayo ni lleve a cabo ningún examen directamente con instrumentos ópticos; evite la exposición directa al rayo.

Declaración 4



PRECAUCIÓN:

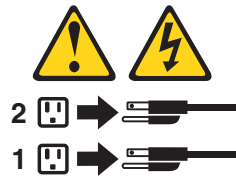
Tome medidas de seguridad al levantar el producto.

Declaración 5



PRECAUCIÓN:

El botón de control de alimentación del dispositivo y el interruptor de alimentación de la fuente de alimentación no apagan la corriente eléctrica suministrada al dispositivo. Es posible también que el dispositivo tenga más de un cable de alimentación. Para eliminar la corriente eléctrica del dispositivo, asegúrese de desconectar todos los cables de alimentación de la fuente de alimentación.



Declaración 10

PRECAUCIÓN:

No coloque ningún objeto que pese más de 82 kg (180 libras) encima de los dispositivos montados en bastidor.



Declaración 20



PRECAUCIÓN:

Para prevenir ferimentos pessoais, antes de levantar a unidade retire todas as lâminas para diminuir o peso.

Declaración 21



PRECAUCIÓN:

Existe energia perigosa quando a lâmina está ligada à fonte de alimentação. Substitua sempre a cobertura da lâmina antes de instalar a mesma.

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Important notes

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

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

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

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

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

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

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Product recycling and disposal

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

Battery return program

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

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

In the Netherlands, the following applies.



Electronic emission notices

Federal Communications Commission (FCC) statement

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

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

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

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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

United Kingdom telecommunications safety requirement

Notice to Customers

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

European Union EMC Directive conformance statement

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

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

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

Taiwanese Class A warning statement

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

Chinese Class A warning statement

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

Japanese Voluntary Control Council for Interference (VCCI) statement

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

Power cords

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

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

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

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

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

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

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

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

Index

A

- Adaptec RAID Configuration Utility
 - using 12
- adapter
 - installing 33
 - PCI-X bus 32
- Array Configuration Utility
 - using to configure the SATA controller 13
- attention notices 2

B

- battery replacement 39
- bays 3
- beep
 - codes 19
 - symptoms 53

C

- caution statements 2
- CD-eject button 7
- CD-ROM
 - drive specification 3
- CD-ROM drive
 - problems 62
- CD-ROM drive activity LED 7
- chart, troubleshooting 22
- checkout, general 17
- checkout, procedure 18
- Class A electronic emission notice 124
- Configuration/Setup Utility program 11
- configuring hardware 11
- connectors 8
- controller
 - SCSI
 - configuring 14
 - Serial ATA
 - configuring 12, 13
 - using the SCSISelect Utility to configure 13
- cover
 - installing 41
 - removing 32

D

- danger statements 2
- device drivers 6
- diagnostic
 - error codes 58
 - error message tables 22
 - error messages 20
 - programs 20, 21
 - programs and error messages 20
 - test log 21
 - test log, viewing 21, 22
 - text messages 20

- diagnostic (*continued*)
 - tools 19
- DIMMs
 - connector locations 38
- diskette drive
 - specifications 3
- diskette drive activity LED 7
- diskette-eject button 7
- display problems 64
- drives 3, 4

E

- electrical input 3
- electronic emission Class A notice 124
- enabling
 - the SCSI HostRAID feature 14
 - the Serial ATA HostRAID feature 13
- environment 3
- error messages
 - diagnostic 20, 22
 - small computer systems interface (SCSI) 22
- error symptoms 62
- errors
 - diagnostic code format 20
 - POST (ISPR) 69
 - POST codes 55
 - SCSI 72
 - ServeRAID 68
 - service processor 68
- Ethernet 4
 - speed indicator 8
 - transmit/receive activity 8
- Ethernet speed 1 Gbps LED 8
- Ethernet transmit/receive activity LED 8
- expansion
 - enclosure problems 62
- expansion bays 3
- expansion slots 3

F

- fan, replacing 38
- FCC Class A notice 124
- feature
 - SATA HostRAID
 - enabling 13
- features 3
 - RAS 5

H

- hard disk drive
 - activity LED 7
 - IDE 35
 - installing 35
 - SCSI 35

- hard disk drive *(continued)*
 - Serial ATA 35
- hardware problems 19
- heat output 3
- HostRAID feature
 - using to configure the integrated SATA controller 13
- HostRAID feature for SCSI
 - enabling 14
 - using to configure the SCSI controller 14
- humidity 3

I

- IBM Director 4, 5
- important notices 2
- installation order, memory modules 37
- installing
 - adapters 33
 - battery 39
 - cover 41
 - hard disk drive 35
- integrated functions 3
- integrated Serial ATA controller
 - configuring 13
- intermittent problems 63
- internal connectors 29

J

- jumpers 29

K

- keyboard
 - problems 63

L

- LEDs 7, 8
 - system locator 7
- local area network (LAN) 4

M

- memory 3, 4
 - problems 64
- memory module
 - order of installation 37
- messages
 - diagnostic error 20, 22
 - diagnostic text 20
 - small computer systems interface (SCSI) error 22
- microprocessor 3
 - problems 64
- monitor problems 64
- mouse problems 63

N

- no-beep symptoms 55
- noise emissions 3
- notes 2
- notes, important 122
- notices
 - electronic emission 124
 - FCC, Class A 124
- notices and statements 2

O

- online publications 2
- option
 - problems 66
- order of installation, memory modules 37

P

- pointing device problems 63
- POST
 - error codes 55
- POST (ISPR) error procedures 69
- POST (power-on self-test) 20
- power
 - problems 66
- power cords 78, 126
- power LED 7
- power requirement 3
- power supply 3
- power-control button 7
- problem determination tips 74
- problems
 - CD-ROM drive 62
 - expansion enclosure 62
 - hard disk drives 62
 - hardware 19
 - intermittent 63
 - keyboard 63
 - memory 64
 - microprocessor 64
 - monitor 64
 - mouse 63
 - option 66
 - pointing device 63
 - power 66
 - serial port 67
 - software 67
 - solving 17
- publications 1

R

- RAS features 5
- recovering
 - POST/BIOS update failure 24
- reset button 7

S

- SATA HostRAID feature
 - enabling 13
- SCSI
 - error codes 72
- SCSI controller
 - configuring 14
- SCSI HostRAID feature
 - enabling 14
 - using to configure the SCSI controller 13
- SCSISelect Utility
 - using to configure the SCSI controller 13
- SCSISelect utility program 14
- serial
 - port problems 67
- Serial ATA hard disk drive 35
- ServeRAID 4
- ServeRAID error codes 68
- ServerGuide 11
 - error symptoms 72
- ServerGuide CD 4
- service processor error codes 68
- size 3
- slots 3
- small computer systems interface (SCSI)
 - error messages 22
- software
 - problems 67
- specifications 3
- Standby mode 8
- starting diagnostic programs 20, 21
- statements and notices 2
- switches and jumpers 29
- system board
 - internal connectors 29
 - jumper blocks 29
 - switches and jumpers 29
- system-error LED 7
- system-locator LED 7
- systems management 5

T

- temperature 3
- test log 22
 - viewing diagnostic 21, 22
- trademarks 122
- troubleshooting
 - chart 22
- turning off the server 9
- turning on the server 9

U

- undetermined problems 73
- United States electronic emission Class A notice 124
- United States FCC Class A notice 124
- UpdateXpress 6
- using
 - Adaptec RAID Configuration Utility 12

using (*continued*)

- SCSI HostRAID to configure the controller 14
- the Adaptec HostRAID configuration programs 12
- the SATA HostRAID feature 13
- the SCSI HostRAID feature 13
- the SCSISelect Utility 13

V

- video controller 3

W

- weight 3



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