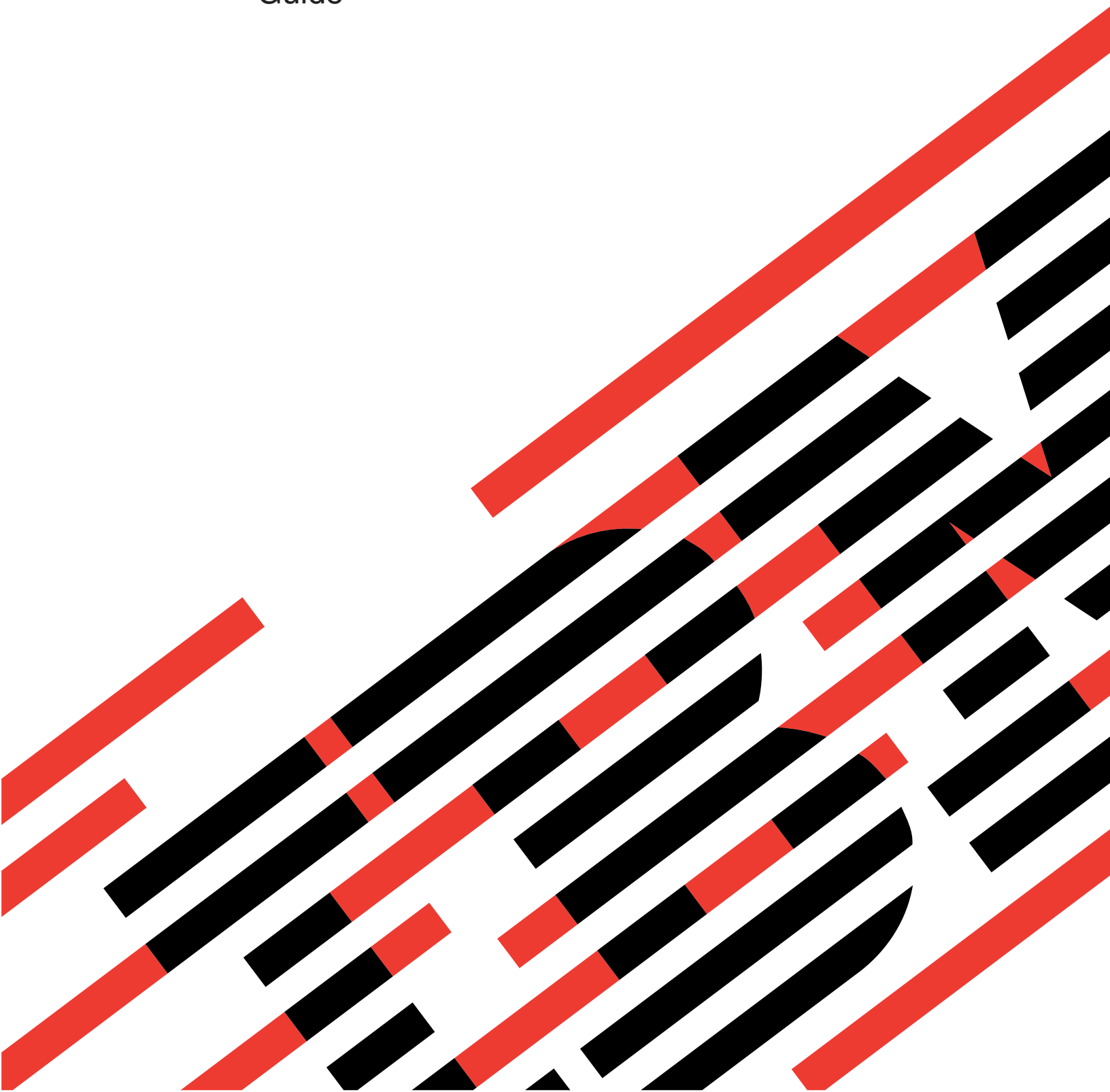




BladeCenter HS20
Type 8678

Hardware Maintenance Manual and Troubleshooting
Guide





@server

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Note

Before using this information and the product it supports, read Appendix C, "Notices," on page 135.

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

Fourth Edition (April 2005)

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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® BladeCenter™ HS20 Type 8678 blade server.

Important: The field replaceable unit (FRU) procedures are intended for trained servicers who are familiar with IBM BladeCenter products. See the parts listing in “System” on page 90 to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU.

Important safety information

Be sure to read all caution and danger statements in this book before performing any of the instructions. See “Safety information” on page 93.

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/pc/support> on the World Wide Web.

Contents

About this manual	iii
Important safety information	iii
Online support	iii
Chapter 1. General information.	1
Related publications	1
Notices and statements used in this book	2
Features and specifications	3
Blade server power, controls, and indicators	4
Turning on the blade server.	4
Turning off the blade server.	4
Blade server controls and LEDs	5
Chapter 2. Configuring your blade server	9
Using the Configuration/Setup Utility program	9
Starting the Configuration/Setup Utility program	9
Configuration/Setup Utility menu choices	9
Using passwords	11
Using Remote Deployment Manager Version 3.1.01 or later	12
Updating the service processor firmware	12
Configuring the Gigabit Ethernet controllers	13
Ethernet controllers	14
Operating systems	15
X window does not start in Red Hat 7.3 when the blade server does not own the KVM	15
Remote console does not work with default SuSE Linux, version 8.0, display settings	15
Installing SuSE to a SCSI drive	16
Mouse is not detected during SuSE installation	16
Mouse offset problems occur when using remote console and running X	16
Blade server does not turn off during Red Hat Linux 7.3 shutdown	16
Blade server does not turn off during SuSE Linux 8.0 shutdown	17
Enabling Wake on LAN for Red Hat Linux 7.3 and SuSE Linux 8.0.	17
IBM Director console does not show WOL for blade server running Red Hat Linux 7.3	18
Linux does not install from the BladeCenter CD-ROM drive, or will not start afterward	19
Linux installation instructions	19
Mouse is not detected during SuSE installation	19
Mouse offset problems occur when using remote console and running an X Window.	19
Red Hat 7.3 hangs in GNOME	19
Remote console does not work with default SuSE Linux, version 8.0, display settings	20
Unhandled exception error during Red Hat Linux 7.3 installation.	20
Chapter 3. Diagnostics	21
General checkout	21
Diagnostic tools overview	23
POST error logs	23
Viewing error logs from the Configuration/Setup Utility program	23
Diagnostic programs and error messages	24
Text messages	24

Starting the diagnostic programs	25
Diagnostic error message tables	26
Light Path Diagnostics feature overview.	26
Identifying problems using the Light Path Diagnostics.	26
Memory errors	27
Error symptoms	27
Error symptom charts	27
Small computer system interface messages	28
Recovering the BIOS code	28
Support telephone numbers	29
Chapter 4. Customer replaceable units	31
Installation guidelines	31
System reliability considerations	31
Handling static-sensitive devices	31
Major components of the BladeCenter HS20 Type 8678 blade server	32
System board illustration	33
System board LED locations	34
Switches and jumpers	35
Removing the blade server from the BladeCenter unit	35
Opening the blade server cover.	37
Removing the blade server bezel assembly	37
Installing IDE hard disk drives	38
Installing memory modules	39
Installing an additional microprocessor	41
Installing an I/O expansion option	44
Installing a SCSI storage expansion unit option	45
Installing a SCSI hot-swap hard disk drive	47
Replacing a SCSI hot-swap hard disk drive	49
Replacing the battery	49
Completing the installation.	51
Installing the blade server bezel assembly	51
Closing the blade server cover	52
Installing the blade server in the BladeCenter unit	53
Updating your blade server configuration	54
Input/output connectors and devices	55
Chapter 5. Service replaceable units	59
Microprocessor removal	59
Thermal grease.	60
System board	61
Chapter 6. Symptom-to-FRU index	63
Beep symptoms	63
No-beep symptoms	66
Diagnostic error codes	66
Light Path Diagnostics	69
Error symptoms	70
POST error codes.	78
Service processor error codes	82
SCSI error codes	82
Temperature error messages.	82
Power error messages	83
System shutdown	85
System errors	85
Temperature related system shutdown	85

DASD checkout	85
Undetermined problems	86
Problem determination tips	87
Chapter 7. Parts listing, HS20 Type 8678	89
System	90
Appendix A. Getting help and technical assistance	91
Before you call	91
Using the documentation	91
Getting help and information from the World Wide Web	91
Software service and support	92
Hardware service and support	92
Appendix B. Related service information	93
Safety information	93
General safety	93
Electrical safety.	94
Safety inspection guide	95
Handling electrostatic discharge-sensitive devices	96
Grounding requirements	96
Safety notices (multi-lingual translations)	96
Appendix C. Notices	135
Edition notice	135
Trademarks.	136
Important notes	136
Product recycling and disposal	137
Electronic emission notices	137
Federal Communications Commission (FCC) statement	137
Industry Canada Class A emission compliance statement	138
Australia and New Zealand Class A statement	138
United Kingdom telecommunications safety requirement	138
European Union EMC Directive conformance statement	138
Taiwanese Class A warning statement	139
Chinese Class A warning statement.	139
Japanese Voluntary Control Council for Interference (VCCI) statement	139

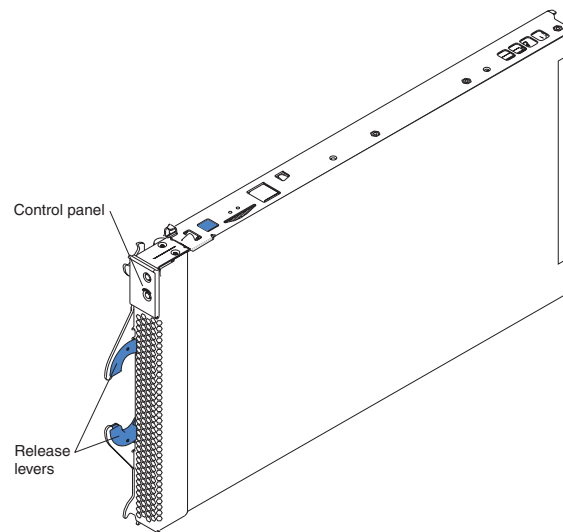
Chapter 1. General information

The IBM BladeCenter HS20 Type 8678 server is a blade-model server that is one of up to 14 blades that can be installed in the IBM @server BladeCenter enclosure Type 8677. This high-performance blade server is ideally suited for networking environments that require superior microprocessor performance, efficient memory management, flexibility, and reliable data storage.

If you have access to the World Wide Web, you can obtain up-to-date information about your server model and other IBM server products at <http://www.ibm.com/>.

The machine type and serial number are located on the ID label that is behind the control panel door on the front of the blade, and on a label on the left side of the blade that is visible when the blade server is not in the BladeCenter.

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



Related publications

This *Hardware Maintenance Manual and Troubleshooting Guide* is provided in Portable Document Format (PDF). It contains information to help you solve a problem yourself or to provide helpful information to a service technician.

In addition to this *Hardware Maintenance Manual and Troubleshooting Guide*, the following BladeCenter HS20 Type 8678 documentation is provided on the IBM *BladeCenter Documentation CD* that comes with the BladeCenter unit:

- *Safety Information*: This publication 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* book.
- *Installation and User's Guide*: This publication provides general information about the blade server, including information about features, how to configure the server, and how to get help.

- *IBM 4-Port Gb Ethernet Switch Module for BladeCenter Installation and User's Guide*: This publication contains instructions for setting up and configuring the IBM 4-Port Gb Ethernet Switch Module for BladeCenter and a description of the switch module features.

Depending on your server model, additional publications might be included on the IBM *BladeCenter® Documentation CD*.

Notices and statements used in this book

The caution and danger statements used in this book also appear in the multilingual *Safety Information* book provided on the IBM *BladeCenter Documentation CD*. Each caution and danger statement is numbered for easy reference to the corresponding statements in the safety book.

The following types of notices and statements are used in this book:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate possible 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 table provides a summary of the features and specifications of the BladeCenter HS20 Type 8678.

Note: Power, cooling, removable-media drives, external ports, and advanced system management are provided by the IBM BladeCenter unit Type 8677.

<p>Microprocessor:</p> <p>Supports up to 2 microprocessors</p> <ul style="list-style-type: none"> • Intel™™ Xeon 2.0 GHz or faster • 512 KB ECC L2 cache <p>Memory:</p> <ul style="list-style-type: none"> • Four double data rate (DDR) PC1600 sockets • Minimum: 512 MB • Maximum: 4 GB • Type: 2-way interleaved, DDR, PC2100, ECC SDRAM registered x4 (Chipkill™) DIMMs only <p>Note: PC2100 DIMMs are backward-compatible and can function in the PC1600 sockets</p> <ul style="list-style-type: none"> • Supports 256 MB, 512 MB, and 1 GB dual inline memory modules (DIMMs) <p>Drives:</p> <ul style="list-style-type: none"> • Support for up to two internal IDE 2.5-inch hard disk drives • Support for up to two Ultra320 SCSI hot-swap hard disk drives available in an optional SCSI storage expansion unit 	<p>Integrated functions:</p> <ul style="list-style-type: none"> • Two Gigabit Ethernet controllers • ATI Rage XL video controller • Light Path Diagnostics™ • Local service processor • IDE hard disk drive controller • RS-485 interface for communication with BladeCenter management module • USB buses for communication with keyboard, mouse, diskette drive, and CD-ROM drive <p>Predictive Failure Analysis® (PFA) alerts:</p> <ul style="list-style-type: none"> • Microprocessor • Memory • Hard disk drives 	<p>Size:</p> <ul style="list-style-type: none"> • Height: 24.5 cm (9.7 inches) • Depth: 44.6 cm (17.6 inches) • Width: 2.9 cm (1.14 inches) • Maximum weight: 5.4 kg (12 lb) <p>Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Blade server on: 10° to 35°C (50° to 95°F). Altitude: 0 to 914 m (2998.69 ft) – Blade server on: 10° to 32°C (50° to 89.6°F). Altitude: 914 m to 2134 m (2998.69 ft to 7000 ft) – Blade server off: -40° to 60°C (-40° to 140° F) • Humidity: <ul style="list-style-type: none"> – Blade server on: 8% to 80% – Blade server off: 5% to 80% <p>Electrical input:</p> <ul style="list-style-type: none"> • Input voltage: 12 V dc
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Blade server power, controls, and indicators

The following information describes the power features, how to turn on and turn off the blade server, and what the controls and indicators mean.

Turning on the blade server

After you connect the BladeCenter unit to ac power, the blade server can start in any of the following ways:

- You can press the power-control button on the front of the blade server (behind the control panel door) to start the server, if local power is enabled.

Notes:

1. After you plug the power cords of your BladeCenter unit into the power distribution unit (PDU), wait until the power-on LED on the blade server flashes slowly before pressing the blade server power-control button. This should take about 20 seconds. During this time, the service processor in the BladeCenter management module is initializing; therefore, the power-control button on the blade server does not respond.
 2. While the server is powering up, the power-on LED on the front of the server is lit.
- If a power failure occurs, the BladeCenter unit and then the blade server can start automatically when power is restored (if the blade server is configured through the BladeCenter management module to do so).
 - You can turn on the blade server remotely by means of the service processor in the BladeCenter management module.

Important: Blade server startups initiated from the network will be faster if you connect the DHCP server to the Ethernet switch in switch bay 2. This is because the BIOS code in the blade server “sees” the bottom Ethernet controller first, and the bottom Ethernet controller in each blade server is associated with the switch in switch bay 2.

- If your operating system supports the Wake on LAN[®] feature and the blade server power-on LED is flashing slowly, the Wake on LAN feature can turn on the blade server (if the BladeCenter management module has not disabled the Wake on LAN feature).

Note: The Wake on LAN (WOL) feature is enabled permanently in the blade server BIOS code. The WOL enabled/disabled setting for each blade server slot is stored in the management module NVRAM. The default setting for each blade server slot is Enabled. To disable WOL for one or more blade servers, use the management module Web interface or the IBM Director console.

Turning off the blade server

When you turn off the blade server, it is still powered through the BladeCenter unit. The blade server can respond to requests from the service processor, such as a remote request to turn on the blade server. To remove all power from the blade server, you must remove it from the BladeCenter unit.

Shut down your operating system before you turn off the blade server. See your operating-system documentation for information about shutting down the operating system.

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

- You can press the power-control button on the blade server (behind the control panel door) if local power is enabled. This starts an orderly shutdown of the operating system, if this feature is supported by your operating system.

Note: After turning off the blade server, wait at least 5 seconds before you press the power-control button to turn on the blade server again.

- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the blade server.
- The management module can turn off the blade server through the service processor.

Note: After turning off the blade server, wait at least 30 seconds for it to stop running (the power light will start blinking) before you remove the blade server from the BladeCenter unit.

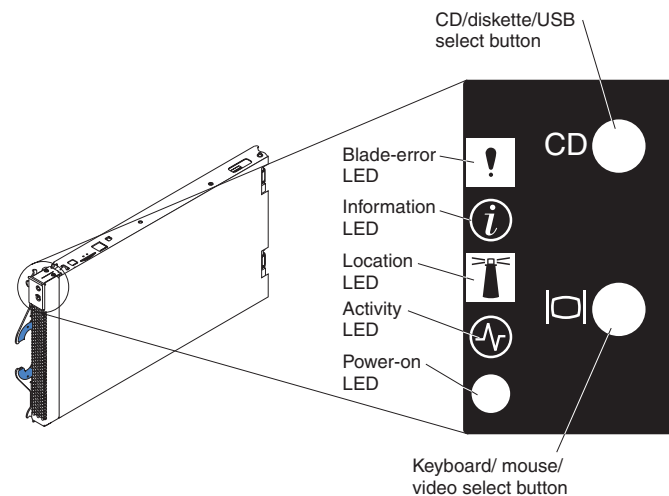
Improper shutdown of a blade server will not allow that blade server to be restarted using Wake on LAN. To reset the blade server power state and re-enable its previously programmed Wake on LAN capability:

1. Turn off the blade server.
2. Unlatch and slide the blade server partially out of the BladeCenter unit.
3. Reinstall the blade server.

Blade server controls and LEDs

This section describes the controls and light-emitting diodes (LEDs) on your blade server.

Note: The control panel is shown in the closed (normal) position in this illustration.



CD/diskette/USB select button: Press this button to associate the CD-ROM drive, diskette drive, and USB port with this blade server.

Note: The CD-ROM drive, diskette drive, keyboard and mouse in the BladeCenter unit are viewed as USB devices by the blade server operating system. The LED on this button flashes while the request is being processed, then is steady when the ownership of the CD-ROM drive, diskette drive, and USB port has been transferred to this blade server. If the button does not respond, verify that switching support is enabled in the BladeCenter unit.

Note: It can take approximately 20 seconds for the operating system in the switched-to blade server to recognize the CD-ROM drive, diskette drive, and USB port, or the keyboard, video, and mouse.

1. The system-error LED might light, and a KVM allocation error might be logged, if the change in ownership for the CD-ROM drive, diskette drive, and USB port, or the keyboard, video, and mouse takes more than 8 seconds. The system-error LED will go off after the ownership change is complete.
2. It can take up to 48 seconds after a blade server is initially turned on before you can attempt to switch KVM control to that blade server.

Blade-error LED: When this amber LED is lit, it indicates that a system error has occurred in the blade server.

Information LED: When this amber LED is lit, it indicates that information about a system error for this blade server has been placed in the BladeCenter system error log.

Location LED: When this blue LED is lit, it has been turned on remotely by the system administrator to aid in visually locating the blade server. The location LED on the BladeCenter unit will be on also.

Activity LED: When this green LED is on, it indicates that there is hard-disk-drive or network activity.

Power-on LED: This green LED indicates the power status of the blade server in the following manner:

- Flashing rapidly – The service processor on the blade server is handshaking with the BladeCenter management module.
- Flashing slowly – The blade server has power but is not turned on.
- Steady – The blade server has power and is turned on.

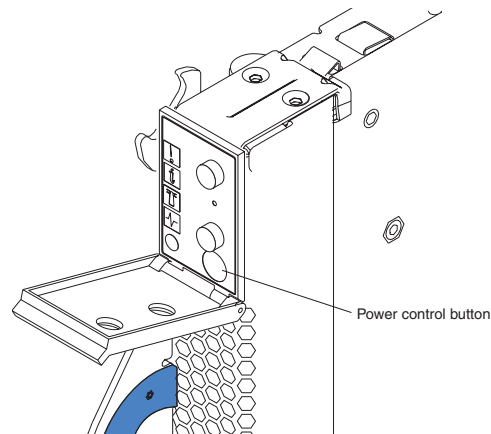
Keyboard/mouse/video select button: Press this button to associate the keyboard port, mouse port, and video port with this blade server. The LED on this button flashes while the request is being processed, then is steady when the ownership of the keyboard, mouse, and video has been transferred to this blade server. If the button does not respond, verify that switching support is enabled in the BladeCenter unit.

Notes:

1. The operating system in a blade server must provide USB support for that blade server to recognize and use the keyboard, mouse, CD-ROM drive, and diskette drive. The BladeCenter unit uses USB for internal communication with these devices.
2. It can take approximately 20 seconds to switch the keyboard, video, and mouse or the CD-ROM drive, diskette drive, and USB port to the blade server.
 - a. The system-error LED might light, and a KVM allocation error might be logged, if the change in ownership for the CD-ROM drive, diskette drive, and USB port, or the keyboard, video, and mouse takes more than 8 seconds. The system-error LED will go off after the ownership change is complete.
 - b. It can take up to 48 seconds after a blade server is initially turned on before you can attempt to switch KVM control to that blade server.
3. If a blade server is under heavy load, it can take several minutes before it enumerates the USB devices connected to it. If control of the KVM and media

tray is switched away from the blade server before this enumeration is complete, a USB device installation error might be received. Do not switch KVM control between blade servers until the mouse and keyboard are both working on the blade server that has control of the KVM and media tray.

4. If you install Microsoft® Windows® 2000 on the blade server while it is not the current owner of the keyboard, video, and mouse, a delay of up to one minute occurs the first time you switch the keyboard, video, and mouse to the blade server. During this one-time-only delay, the blade server Device Manager enumerates the keyboard, video, and mouse and loads the device drivers. All subsequent switching takes place in the normal keyboard-video-mouse switching time frame.
5. The location LED can be turned off through the BladeCenter management-module Web interface or the IBM Director console. The IBM Director program is a system-management product that comes with the BladeCenter unit.



Power-control button: This button is located behind the control panel door. Press this button to manually turn the blade server on or off.

Note: This button has effect only if local power control is enabled for the blade server. Local power control is enabled and disabled through the BladeCenter management module Web interface.

Chapter 2. Configuring your blade server

The Configuration/Setup Utility program is provided with your blade server. This is part of the basic input/output system (BIOS) code in your blade server. Use it to change interrupt request (IRQ) settings, set the date and time, and set passwords. See “Using the Configuration/Setup Utility program” for more information.

The following product is available from the World Wide Web:

- **IBM Remote Deployment Manager Version 3.1.01 or later**

If the blade server patch has been applied to the IBM Remote Deployment Manager (RDM) Version 3.1.01 (or later), you can use RDM to install a BIOS update onto the blade server. For information about using this product, see “Using Remote Deployment Manager Version 3.1.01 or later” on page 12.

For information about setting up your network configuration for remote management, such as with the IBM Director products, see the *IBM BladeCenter Planning and Installation Guide*. You can obtain the planning guide from the Web site at <http://www.ibm.com/pc/eserver/bladecenter>.

Using the Configuration/Setup Utility program

This section provides instructions to start the Configuration/Setup Utility program and descriptions of the menu choices.

Starting the Configuration/Setup Utility program

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

1. Turn on the blade server and watch the monitor screen.
2. When the message Press F1 for Configuration/Setup appears, press F1.
3. Follow the instructions that appear on the screen.

Configuration/Setup Utility menu choices

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

- **System Summary**

Select this choice to display configuration information, including the type, speed, and cache sizes of the microprocessors and the amount of installed memory.

When you make configuration changes through other options in the Configuration/Setup Utility program, the changes are reflected in the system summary; you cannot change settings directly in the system summary.

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

- **System Information**

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

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

- **Product Data**

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

- **Devices and I/O Ports**

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

Select this choice to enable or disable the integrated IDE and Ethernet controllers.

- The default setting is **Enable** for the IDE and Ethernet controllers. If you select **Disable**, the system will not configure the disabled device, and the operating system will not detect the device. (This is equivalent to unplugging the device.)
- If the on-board IDE controller is disabled and no other controller and mass storage device are installed, operating-system startup cannot occur.

- **Date and Time**

Select this choice to set the system date and time, in 24-hour format (*hour:minute:second*). This choice is on the full Configuration/Setup Utility main menu only.

You can set a time to be added or subtracted from the system time that is sent to the service processor each time the blade server is started. Use the number keys to type the hours and minutes and + or – to add or subtract from the system time. If you want the system clock time to be the same as the service processor clock time, leave the value set at its default of 0.

- **System Security**

Select this choice to set a power-on password. See “Using passwords” on page 11 for more information about the password.

- **Start Options**

Select this choice to view or change the start options. This choice appears only on the full Configuration/Setup Utility main menu. Start options take effect when you start your blade server.

Note: To set the startup sequence, which is the order in which the blade server checks devices to find a boot record, you must use the BladeCenter management module Web interface.

You can set keyboard operating characteristics, such as whether the blade server starts with the keyboard number lock on or off. You can enable the blade server to run without a diskette drive or keyboard.

You can enable or disable the Preboot eXecution Environment (PXE) option for both of the integrated Gigabit Ethernet controllers. The default setting for this menu item is **Enabled**, which enables the PXE option for both controllers. To disable this option for the Gigabit Ethernet controllers, select **Disabled**.

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

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

- **Advanced Setup**

Select this choice to change settings for advanced hardware features.

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

- **System Partition Visibility**

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

- **Memory Settings**

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

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

- **CPU Options**

Select this choice to enable or disable the microprocessor cache. In addition, you can set the microprocessor cache mode to write-back (WB) or write-through (WT). Write-back caching generally provides better system performance.

- **PCI Bus Control**

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

- **Integrated System Management Processor Settings**

Select this choice to enable or disable the **Reboot on System NMI** option on the menu. If you enable this option, the blade server will automatically restart 60 seconds after the service processor issues a non-maskable interrupt (NMI) to the blade server.

- **Error Logs**

Select this choice to view or clear the POST error log.

- Select **POST Error Log** to view the three most recent error codes and messages that the system generated during POST.

From the **POST Error Log** menu, select **Clear event/error logs** to clear the Error log.

Note: For information about the System Error log, which is run through the management module of the BladeCenter unit, refer to the *BladeCenter Hardware Maintenance Manual and Troubleshooting Guide*.

- **Save Settings**

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

- **Restore Settings**

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

- **Load Default Settings**

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

- **Exit Setup**

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

Using passwords

From the **System Security** choice, you can set, change, and delete a power-on password.

Power-on password

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

You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for the password. Keep a record of your password in a secure place.

If you forget the power-on password, you can regain access to the blade server through one of the following methods:

- Remove the blade server battery, wait 15 minutes, then reinstall the battery (see “Replacing the battery” on page 49).
- Change the position of the power-on password override switch (switch 8 on switch block 2 on the system board) to bypass the power-on password check the next time the blade server is turned on. You can then start the Configuration/Setup Utility program and change the power-on password. You do not need to move the switch back to the previous position after the password is overridden. See “Switches and jumpers” on page 35 for the location of switch block 2.

Note: Shut down the operating system, turn off the blade server, and remove the blade server from the BladeCenter unit to access the switches.

Using Remote Deployment Manager Version 3.1.01 or later

You can use the Remote Deployment Manager (RDM) Version 3.1.01 (or later) program to install a BIOS update onto a blade server only if the blade server patch has been applied to RDM. Follow the instructions in the documentation that comes with the RDM program and with the patch to log into the BladeCenter system and install a BIOS update.

Use the Remote Deployment Manager Version 3.1.01 (or later) program with the RDM patch 2 (blade server patch) applied to install a supported Microsoft Windows operating system onto a blade server. Follow the instructions in the documentation that comes with the RDM program and with the patch, to log into the BladeCenter system and install a supported Microsoft Windows operating system. See the *IBM @server BladeCenter HS20 Type 8678 Installation and User's Guide* and the Remote Deployment Manager documentation for more information.

Go to the following Web site for updated information about the RDM Version 3.1.01 program and to download the software:
http://www.pc.ibm.com/eserver/xseries/systems_management/index.html.

Updating the service processor firmware

The service processor in your blade server provides the following features:

- Continuous health monitoring and control
- Configurable notification and alerts
- Event logs that are timestamped, saved in nonvolatile memory, and can be attached to e-mail alerts
- Remote graphics console redirection
- Point-to-point protocol (PPP) support
- Remote power control

- Remote firmware update and access to critical server settings
- Around-the-clock access to the blade server, even if the server is turned off

At some time, you might need to flash the service processor to apply the latest firmware. Download the latest firmware for your blade server service processor from the IBM Support Web site at <http://www.ibm.com/pc/support>. Use the BladeCenter management module Web interface to flash the service processor. The Web interface is described in the IBM *BladeCenter Installation and User's Guide* on the IBM *BladeCenter Documentation CD*.

Configuring the Gigabit Ethernet controllers

The Ethernet controllers are integrated on each blade server system board. The Ethernet controllers provide 1000-Mbps full-duplex capability only, which enables simultaneous transmission and reception of data to the external ports on the Ethernet switches. You do not need to set any jumpers or configure the controllers for the blade server operating system. However, you must install a device driver in the blade server to enable the blade server operating system to address the Ethernet controllers.

For blade server device drivers and information about configuring the Ethernet controllers, see the *Broadcom NetXtreme Ethernet Software CD* that comes with the BladeCenter unit.

Important: The Make Disk choice may appear on the main menu of the Broadcom NetXtreme Software CD. This choice is nonfunctional and is not needed to configure the BladeCenter unit or blade server. See the README file on the Broadcom NetXtreme Software CD for more information.

Note: Enumeration of the Ethernet controllers is operating-system dependent. For example, the Ethernet controller located nearer the top of the blade server, whose communications are routed through Ethernet switch module 1, is designated as the first connection (or Local Area Connection) by Microsoft Windows 2000, but is designated as the second connection (or eth1) by Red Hat Linux Version 7.3. The Ethernet controller located nearer the bottom of the blade server, whose communications are routed through Ethernet switch module 2, is designated as the second connection (or Local Area Connection 2) by Microsoft Windows 2000 but is designated as the first connection (or eth0) by Red Hat Linux Version 7.3. You can verify the designations through your operating system settings or by testing:

1. Install only one Ethernet switch module, in switch bay 1.
2. Enable only one of the Ethernet controllers on the blade server. Make note of the designation the blade server operating system has for the controller.
3. Ping an external computer on the network connected to the switch module.

If you can ping the external computer, the Ethernet controller you enabled is the upper controller in the blade server and is associated with Ethernet switch 1.

In the BIOS Setup Utility, the ethernet port designated as Planar Ethernet 1 is routed to ethernet switch module 2 and the ethernet port designated as Planar Ethernet 2 is routed to ethernet switch module 1.

Your Ethernet controllers support failover, which provides automatic redundancy for your Ethernet controllers. You can configure either one of the integrated Ethernet controllers as the primary Ethernet controller. If you have configured the controllers for failover and the primary link fails, the secondary controller takes over. When the primary link is restored, the Ethernet traffic switches back to the primary Ethernet controller. (See your operating system device driver documentation for information about configuring for failover.)

Important: To support failover on the blade server Ethernet controllers, the Ethernet switch modules in the BladeCenter unit must have configurations identical to each other.

Ethernet controllers

The following information may be helpful in working with the Ethernet controllers.

- Operating systems number Ethernet controllers differently.

Enumeration of the Ethernet controllers in a blade server is operating-system dependent. For example, the Ethernet controller located nearer the top of the blade server, whose communications are routed through Ethernet switch module 1, is designated as the first connection (or Local Area Connection) by Microsoft Windows 2000, but is designated as the second connection (or eth1) by Red Hat Linux Version 7.3. The Ethernet controller located nearer the bottom of the blade server, whose communications are routed through Ethernet switch module 2, is designated as the second connection (or Local Area Connection 2) by Microsoft Windows 2000 but is designated as the first connection (or eth0) by Red Hat Linux Version 7.3. In the blade server Configuration/Setup Utility program, the Ethernet port designated as Planar Ethernet 1 is routed to Ethernet switch module 2 and the Ethernet port designated as Planar Ethernet 2 is routed to Ethernet switch module 1.

You can verify the designations through your operating system settings or by testing:

1. Install only one switch module, in switch bay 1.
2. Enable only one of the Ethernet controllers on the blade server. Make note of the designation the blade server operating system has for the controller.
3. Ping an external computer on the network connected to the switch module.

If you can ping the external computer, the Ethernet controller you enabled is the upper controller in the blade server and is associated with Ethernet switch 1.

- Two Ethernet switch modules are required to use both dual Ethernet channels of the blade server.

One Ethernet switch module is installed in the BladeCenter unit and is fully functional with blade server integrated Ethernet channel ETH0. If the second blade server integrated Ethernet channel ETH1 is configured, it is unable to communicate with network resources.

Within the BladeCenter unit, Ethernet switch modules are physically wired independently to the integrated Ethernet controller channels of each blade server: the ETH0 Ethernet controller channel on the blade server is wired to the top Ethernet switch module and the ETH1 Ethernet controller channel on the blade server is wired to the bottom Ethernet switch module. Two Ethernet switch modules are required to use both blade server Ethernet channels.

See the *IBM @server BladeCenter Type 8677 Installation and User's Guide* for more information.

Operating systems

Instructions for installing an operating system on a blade server can be found at <http://www.ibm.com/pc/support> on the World Wide Web. Operating systems and versions that are officially supported for the blade servers are listed on the ServerProven website at <http://www.ibm.com/pc/us/compat> on the World Wide Web.

The following sections describe certain situations that might be encountered when installing Linux.

X window does not start in Red Hat 7.3 when the blade server does not own the KVM

For Red Hat Linux 7.3 with kernel prior to 2.4.18-17.7.x, the X window does not start in a blade server if the blade server is not the current owner of the keyboard, video, and mouse (KVM). Because the blade server does not own the KVM, the X window cannot find the mouse.

Do one of the following:

- Install the 2.4.18-17.7.x or later kernel errata, available from <https://rhn.redhat.com/errata/rh73-errata.html>.

-- OR --

- Add the following line to the `/etc/modules.conf` file.

```
alias char-major-13 mousedev
```

Remote console does not work with default SuSE Linux, version 8.0, display settings

The remote console requires a display setting of 1024x768@60Hz in the blade server operating system. The default resolution in SuSE is 1024x768, but the default refresh rate falls somewhere between 50Hz and 60Hz. The remote console does not work for a blade server running SuSE with a display refresh rate other than exactly 60Hz. The message “eServer/No video available” displays. Other operating systems do not exhibit the problem.

To work around this situation, set the refresh rate in the XF86Config file to exactly 60Hz. There are two methods.

1. Method 1 (unattended network install, prevent the problem): Modify the AutoYaST control file to specify 1024x768@60Hz.
 - a. Run the graphical interface to the AutoYaST control file to set the VESA video mode to 1040x768@60Hz. The graphical interface creates the AutoYaST control file.
 - b. Edit the resulting AutoYaST control file to set the value for `min_vsync` to 60. During an unattended network install, the YaST program uses the AutoYaST control file to modify the XF86Config file (`/etc/X11/XF86Config`); these changes will cause XF86Config to set the display resolution to 1040x768 with a refresh rate of 60Hz.
2. Method 2 (situation has already occurred): Modify the xF86Config file.
 - a. In the Monitor section of `/etc/X11/XF86Config`, change the value of `VertRefresh` to 60, as shown in these sample lines.

Section "Monitor"

Option

HorizSync

"CalcAlgorithm" "IteratePrecisely"

31-48

Identifier	"Monitor[0]"
ModelName	"AutoDetected"
Option	"DPMS"
VendorName	"AutoDetected"
VertRefresh	60
UseModes	"Modes[0]"
EndSection	

- b. Shut down X; then, restart it.

Installing SuSE to a SCSI drive

The SuSE Linux operating system sees the diskette drive as a SCSI device. When you are trying to install SuSE to a SCSI hard disk drive in a blade server SCSI storage expansion unit and the blade server is the current owner of the media tray (CD-ROM drive, diskette drive, and USB port), the SCSI identification of the diskette drive can cause problems. SuSE might not install properly to the SCSI hard disk drive.

For a remote (network) installation, make sure the blade server is not the current owner of the media tray before you attempt to install the SuSE Linux operating system on the blade server.

There is currently no workaround for a local installation.

Mouse is not detected during SuSE installation

The installation of the SuSE Linux version 8.0 operating system does not detect the mouse.

You will need to select the mouse manually. Download the latest operating system installation instructions for your operating system from the IBM Support Web page at <http://www.ibm.com/pc/support/>. The steps for selecting the mouse are described in the instructions for your operating system.

Mouse offset problems occur when using remote console and running X

When you are using the remote console on a blade server that is running X Windows in Red Hat Linux 7.3 or SuSE Linux version 8.0, you see two cursor arrows on the screen, widely spaced, one white and one black.

Configure Linux and X Windows for accurate mouse tracking. See the online help information in the management module configuration and management software for instructions (Blade Tasks » Remote Control, click the circled question mark next to Redirect Server Console, read the section titled Notes on mouse support under Linux).

Blade server does not turn off during Red Hat Linux 7.3 shutdown

Issuing any of the Linux shutdown commands shuts down the operating system, but does not turn off the blade server. The blade server shuts down to the point where a message is displayed on the management module saying that the blade server is off, but the blade server power-on LED remains lit.

Known configuration affected: Red Hat Linux 7.3.

Complete the instructions provided for Red Hat in “Enabling Wake on LAN for Red Hat Linux 7.3 and SuSE Linux 8.0” to enable Wake On LAN for both onboard Broadcom integrated Ethernet controllers. This will allow the blade server to restart using Wake on LAN even if the Linux shutdown is incomplete and the blade server does not turn off.

Forcing a blade server to turn off

Complete the following steps to turn off a blade server, after an incomplete Linux shutdown:

Manually press the power-control button on the front of the blade server (behind the control panel door) to turn off the blade server. Turning off the blade server in this way is considered an improper shutdown by the Wake on LAN feature, which will not allow the Wake on LAN feature to restart the blade server. Unlatch and slide the blade server partially out of the BladeCenter; then, reinstall it to reset the blade server power state and re-enable its previously programmed Wake on LAN capability.

Blade server does not turn off during SuSE Linux 8.0 shutdown

Issuing any of the Linux shutdown commands shuts down the operating system, but does not turn off the blade server. The blade server shuts down to the point where a message is displayed on the management module saying that the blade server is off, but the blade server power-on LED remains lit.

Known configuration affected: SuSE Linux 8.0

A blade server running SuSE Linux 8.0 will not turn off during shutdown if ACPI is not enabled. Complete the following steps to enable ACPI:

1. Type the following command: `modprobe ospm_system`
2. Type the following command to save this setting upon subsequent reboots: `echo "/sbin/modprobe ospm_system" >> /etc/init.d/boot.local`

Enabling Wake on LAN for Red Hat Linux 7.3 and SuSE Linux 8.0

Complete the following steps to enable Wake On LAN for both onboard Broadcom integrated Ethernet controllers. This will allow the blade server to restart using Wake on LAN even if the Linux shutdown is incomplete and the blade server does not turn off.

- For SuSE Linux:
 1. Type the following command to enable ACPI: `modprobe ospm_system`
 2. Type the following command to save this setting upon subsequent reboots: `echo "/sbin/modprobe ospm_system" >> /etc/init.d/boot.local`
 3. Enable Wake on LAN:
 - Enter the following command to immediately enable Wake on LAN on the blade server in a running system:

```
insmod bcm5700.o enable_wol=1,1
```
 - Edit the `/etc/modules.conf` file and add the following lines to enable Wake on LAN automatically every time the blade server starts:

```
alias eth0 bcm5700
alias eth1 bcm5700
options eth0 enable_wol=1
options eth1 enable_wol=1
```
- For Red Hat Linux:

- Enter the following command to immediately enable Wake on LAN on the blade server in a running system:


```
insmod bcm5700.o enable_wol=1,1
```
- Edit the `/etc/modules.conf` file and add the following lines to enable Wake on LAN automatically every time the blade server starts:


```
alias eth0 bcm5700
alias eth1 bcm5700
options eth0 enable_wol=1
options eth1 enable_wol=1
```

Recompile the driver for your Linux image. See the documentation that comes with your operating system for information about compiling drivers.

To compile the Broadcom drivers successfully in Red Hat Linux or SuSE Linux, a default installation is not sufficient because all files needed to compile successfully are not included. A custom installation of RedHat Linux or SuSE Linux, in which the packages for software and kernel development are chosen, will include the files required for successful compilation of the drivers.

IBM Director console does not show WOL for blade server running Red Hat Linux 7.3

After you install the IBM Director agent on a blade server running Red Hat 7.3 and start the IBM Director service, Blade with Agent does appear on the IBM Director console, but the Wake on LAN (WOL) feature does not appear. You must enable WOL in the IBM Director Agent on the blade server and in the Ethernet controllers on the blade server.

Complete the following steps to enable Wake on LAN:

1. Stop IBM Director Agent. To do this, type the following command and press Enter:


```
/opt/IBM/director/bin/twgstop
```
2. Open an ASCII text editor and edit the `ServiceNodeLocal.properties` file. This file is located in `/opt/IBM/director/data`.
3. Modify the value of `ipc.wakeonlan` to read as follows:


```
ipc.wakeonlan=1
```
4. Save and close the `ServiceNodeLocal.properties` file.
5. Start IBM Director Agent. Type the following command and press Enter:


```
/opt/IBM/director/bin/twgstart
```

To enable Wake on LAN in the Ethernet controllers:

- Enter the following command to immediately enable Wake on LAN on the blade server in a running system:


```
insmod bcm5700.o enable_wol=1,1
```
- Edit the `/etc/modules.conf` file and add the following lines to enable Wake on LAN automatically every time the blade server starts:


```
alias eth0 bcm5700
alias eth1 bcm5700
options eth0 enable_wol=1
options eth1 enable_wol=1
```

Linux does not install from the BladeCenter CD-ROM drive, or will not start afterward

Neither Red Hat Linux 7.3 nor SuSE Linux version 8.0 will install locally, although Red Hat Linux might appear to install.

- If you try to install Red Hat Linux to the blade server IDE drive, Linux does not install.
- If you try to install Red Hat Linux to the SCSI drive on a blade server expansion unit, Linux appears to install but the operating system will not start properly.
- If you try to install SuSE Linux, Linux does not install.

You can download the latest operating system installation instructions for your operating system from the IBM Support Web page at <http://www.ibm.com/pc/support>. The necessary workaround is described in the instructions for your operating system.

Linux installation instructions

Download the latest instructions for installing a Linux operating system on a blade server from the IBM Support Web page at: <http://www.ibm.com/pc/support/> on the World Wide Web. Each set of instructions specifies everything you need to perform the installation.

Mouse is not detected during SuSE installation

The installation of the SuSE Linux version 8.0 operating system does not detect the mouse. You need to select the mouse manually. Download the latest operating system installation instructions for your operating system from the IBM Support Web page at <http://www.ibm.com/pc/support>. The steps for selecting the mouse are described in the instructions for your operating system.

Mouse offset problems occur when using remote console and running an X Window

When you are using the remote console on a blade server that is running an X Window in Red Hat Linux 7.3 or SuSE Linux version 8.0, you see two cursor arrows on the screen, widely spaced: one white and one black.

You can configure Linux and the X Window for accurate mouse tracking. See the online help information in the management module configuration and management software for instructions (**Blade Tasks ” Remote Control**, click the circled question mark next to **Redirect Server Console**, read the section titled **Notes on mouse support under Linux**).

Red Hat 7.3 hangs in GNOME

Red Hat Linux 7.3 running on a blade server hangs when running the GNOME X Window and you switch ownership of the media tray to the blade server. The hang generally occurs within 30 minutes of switching ownership to the blade server.

You can remove the magicdev package. To do this, enter the command: `rpm -e magicdev`; then, restart the blade server.

Remote console does not work with default SuSE Linux, version 8.0, display settings

The remote console requires a display setting of 1024x768@60Hz in the blade server operating system. The default resolution in SuSE is 1024x768, but the default refresh rate falls somewhere between 50Hz and 60Hz. The remote console does not work for a blade server running SuSE with a display refresh rate other than exactly 60Hz. The message “eServer/No video available” displays.

Other operating systems do not exhibit the problem.

You can set the refresh rate in the XF86Config file to exactly 60Hz by using one of the following two methods:

- **Method 1 (unattended network install, prevent the problem):** Modify the AutoYaST control file to specify 1024x768@60Hz.
 1. Run the graphical interface to the AutoYaST control file to set the VESA video mode to 1040x768@60Hz. The graphical interface creates the AutoYaST control file.
 2. Edit the resulting AutoYaST control file to set the value for min_vsync to 60.During an unattended network install, the YaST program uses the AutoYaST control file to modify the XF86Config file (/etc/X11/XF86Config); these changes will cause XF86Config to set the display resolution to 1040x768 with a refresh rate of 60Hz.

-- OR --

- **Method 2 (situation has already occurred):** Modify the xF86Config file.
 1. In the Monitor section of the /etc/X11/XF86Config file, change the value of VertRefresh to 60, as shown in these sample lines.

```
Section "Monitor"
Option      "CalcAlgorithm" "IteratePrecisely"
  HorizSync  31-48
Identifier  "Monitor[0]"
  ModelName  "AutoDetected"
Option      "DPMS"
VendorName  "AutoDetected"
  VertRefresh 60
  UseModes   "Modes[0]"
EndSection
```

2. Shut down the X Window; then, restart it.

Unhandled exception error during Red Hat Linux 7.3 installation

Description: An unhandled exception error is received while installing Red Hat Linux 7.3 from the second operating system installation CD and the installation terminates.

Known configuration affected: Red Hat Linux 7.3

Solution:

Restart the installation and perform the following steps:

1. At the Package Group Selection window, select **Select individual packages**.
2. At the Individual Package Selection window, select **Applications** and then select **Internet**; then, deselect all the Mozilla packages that are listed.
3. After you finish installing the Red Hat Linux operating system, install the latest Mozilla packages listed at <https://rhn.redhat.com/errata/rh73-errata.html> on the World Wide Web.

Chapter 3. Diagnostics

This section provides basic troubleshooting information to help you resolve some common problems that might occur with your server.

If you cannot locate and correct the problem using the information in this section, see Appendix A, “Getting help and technical assistance,” on page 91 for more information.

General checkout

The server diagnostic programs are stored in the upgradeable read-only memory (ROM). These programs test the major components of your blade server. The IBM Director product provides a Real Time Diagnostics program that tests the major components of your blade server while the server operating system is running. The diagnostics can be downloaded from <http://www.ibm.com/pc/support>.

If you cannot determine whether a problem is caused by the hardware or by the software, you can run the diagnostic programs to confirm that the hardware is working properly.

When you run the diagnostic programs, a single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After the cause of the first error message is corrected, the other error messages might not occur the next time you run the test.

Notes:

1. If multiple error codes are displayed, diagnose the first error code that is displayed.
2. If the server stops with a POST error, go to “POST error codes” on page 78.
3. If the blade server stops and no error is displayed, go to “Undetermined problems” on page 86.
4. For safety information, see “Safety information” on page 93.
5. For intermittent problems, check the error log.
6. If blade front panel shows no LEDs, verify blade status and errors in BladeCenter web interface; also see “Undetermined problems” on page 86.
7. If device errors occur, see “Error symptoms” on page 70.

001 USE THE FOLLOWING PROCEDURE TO CHECKOUT THE SERVER.

1. Turn off the server and all external devices, if attached.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Turn on all external devices.
5. Turn on the server.
6. Record any POST error messages that are displayed on the screen. If an error is displayed, look up the first error in the "POST error codes" on page 78.
7. Check the information LED panel Blade Error LED; if it is on, see "Identifying problems using the Light Path Diagnostics" on page 26.
8. Check the System Error log. If an error was recorded by the system, see Chapter 6, "Symptom-to-FRU index," on page 63.
9. Start the diagnostic programs.
10. Check for the following responses:
 - One beep.
 - Readable instructions or the main menu.

002 DID YOU RECEIVE BOTH OF THE CORRECT RESPONSES?

NO. Find the failure symptom in Chapter 6, "Symptom-to-FRU index," on page 63.

YES. Run the diagnostic programs. If necessary, see "Diagnostic programs and error messages" on page 24.

If you receive an error, see Chapter 6, "Symptom-to-FRU index," on page 63.

If the diagnostic programs were completed successfully and you still suspect a problem, see "Undetermined problems" on page 86.

Diagnostic tools overview

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

- **POST beep codes**

The power-on self-test beep codes indicate the detection of a problem.

- One beep indicates successful completion of POST.
- More than one beep indicates that POST detected a problem. Error messages also appear during startup if POST detects a hardware-configuration problem.

See “Beep symptoms” on page 63 for more information.

- **Error symptom charts**

This chart lists problem symptoms and steps to correct the problems. See “Error symptoms” on page 70 for more information.

- **Diagnostic programs and error messages**

The built-in system diagnostic programs are upgradeable read-only memory (ROM). These programs test the major components of your blade server. A plug-in to the IBM Director product, the Real Time diagnostics program tests the major components of your blade server, including the BladeCenter CD-ROM drive and diskette drive, while the server operating system is running. The Real Time diagnostics are available for download on the World Wide Web at <http://www.ibm.com>.

- **Light Path Diagnostics feature**

Use the Light Path Diagnostics feature to identify system errors quickly.

POST error logs

When you turn on the server, it performs a series of tests to check the operation of server components and some of the options that are installed in the blade server. This series of tests is called the power-on self-test, or POST.

If POST finishes without detecting any problems, a single beep sounds, and the first screen of your operating system or application program appears.

If POST detects a problem, more than one beep sounds, and an error message appears on your screen. See “Beep symptoms” on page 63 and “POST error codes” on page 78 for more information.

Notes:

1. If you have a power-on password set, you must type the password and press Enter, when prompted, before POST will continue.
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 not occur the next time you run the test.

The POST error log contains the three most recent error codes and messages that the system generated during POST. The System Error log refers you to the management module log, which can be accessed through the BladeCenter unit.

Viewing error logs from the Configuration/Setup Utility program

Start the Configuration/Setup Utility program; then, select **Error Logs** from the main menu. See “Using the Configuration/Setup Utility program” on page 9 for more information.

Diagnostic programs and error messages

The server diagnostic programs are stored in ROM on the system board. These programs are the primary method of testing the major components of your server.

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

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

The following sections contain the error codes that might appear in the detailed test log and summary log when the diagnostic programs are run.

The error code format is as follows:

`fff-ttt-iii-date-cc-text message`

where:

- fff** is the three-digit function code that indicates the function being tested when the error occurred. For example, function code 089 is for the microprocessor.
- ttt** is the three-digit failure code that indicates the exact test failure that was encountered. (These codes are for trained service personnel; see “Diagnostic error codes” on page 66.)
- iii** is the three-digit device ID. (These codes are for trained service personnel; see “Diagnostic error codes” on page 66.)
- date** is the date that the diagnostic test was run and the error recorded.
- cc** is the check value that is used to verify the validity of the information.
- text message** is the diagnostic message that indicates the reason for the problem.

Text messages

The diagnostic text message format is as follows:

Function Name: Result (test specific string)

where:

Function Name

is the name of the function being tested when the error occurred. This corresponds to the function code (fff) shown in the error code format in the previous section.

Result

can be one of the following:

- Passed** This result occurs when the diagnostic test is completed without any errors.
- Failed** This result occurs when the diagnostic test discovers an error.

User Aborted This result occurs when you stop the diagnostic test before it is complete.

Not Applicable

This result occurs when you specify a diagnostic test for a device that is not present.

Aborted This result occurs when the test could not proceed, for example, because of the system configuration.

Warning This result occurs when a possible problem is reported during the diagnostic test, such as when a device driver is not found.

test specific string

is additional information that you can use to analyze the problem.

Starting the diagnostic programs

You can press F1 while running the diagnostic programs to obtain help information. You also can press F1 from within a help screen to obtain online documentation from which you can select different categories. To exit from the help information and return to where you left off, press Esc.

Complete the following steps to start the diagnostic programs:

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

Note: When running the diagnostic programs, make sure that the blade server controls the needed components for the tests, including the CD-ROM drive, diskette drive, and USB port. You can use the selection buttons on the blade server to make necessary adjustments.

2. When the message F2 for Diagnostics appears, press F2.
3. Type the appropriate password; then, press Enter.
4. After the diagnostic programs start, select either **Extended** or **Basic** from the top of the screen.
5. When the Diagnostic Programs screen appears, select the test you want to run from the list that appears; then, follow the instructions on the screen.

Notes:

- a. If the blade server stops during testing and you cannot continue, restart the blade server and try running the diagnostic programs again. If the problem remains, replace the component that was being tested when the blade server stopped.
- b. The keyboard and mouse (pointing device) tests assume that a keyboard and mouse are attached to the BladeCenter and that the blade server controls them.
- c. If you run the diagnostic programs with either no mouse or a mouse attached to the BladeCenter unit that is not controlled by the blade server, you will not be able to navigate between test categories using the **Next Cat** and **Prev Cat** buttons. All other functions provided by mouse-selectable buttons are also available using the function keys.
- d. You can view server configuration information (such as system configuration, memory contents, and device drivers) by selecting **Hardware Info** from the top of the screen.

If the diagnostic programs do not detect any hardware errors but the problem persists during normal server operations, a software error might be the cause. If you suspect a software problem, see the information that comes with the software package.

Viewing the test log

When the tests are completed, you can view the test log by selecting **Utility** from the top of the screen and then selecting **View Test Log**.

Notes:

1. You can view the test log only while you are in the diagnostic programs. When you exit the diagnostic programs, the test log is cleared (saved test logs are not affected). To save the test log so that you can view it later, click **Save Log** on the diagnostic programs screen and specify a location and name for the saved log file.
2. To save the test log to a diskette, you must use a diskette that you have formatted yourself; this function does not work with preformatted diskettes. If the diskette has sufficient space for the test log, the diskette may contain other data.

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 66.

Notes:

1. Depending on your server configuration, some of these error messages might not appear when you run the diagnostic programs.
2. If diagnostic error messages appear that are not listed in the error message tables, make sure that your server has the latest levels of BIOS, service processor, and diagnostics microcode installed.

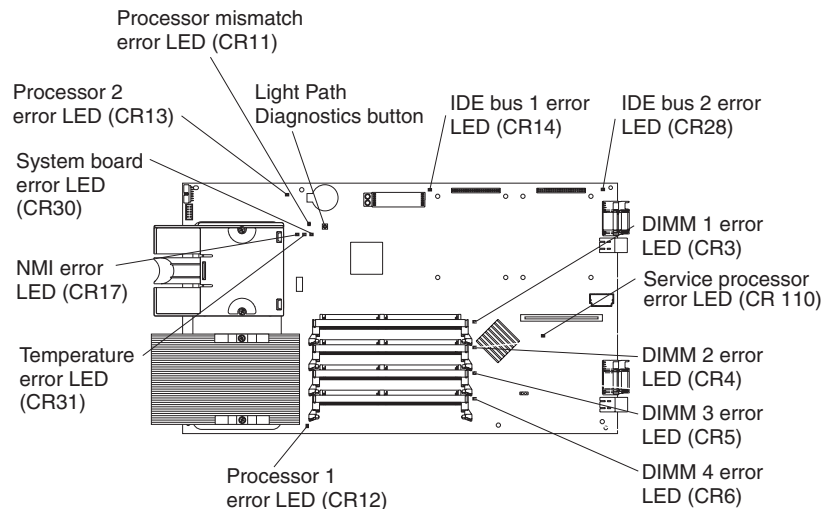
Light Path Diagnostics feature overview

If the system-error LED on the system LED panel on the front or rear of the BladeCenter unit is lit, one or more error LEDs on the BladeCenter components also might be on. These LEDs help identify the cause of the problem.

Identifying problems using the Light Path Diagnostics

This section provides the information to identify, using the Light Path Diagnostics™, problems that might arise.

To locate the actual component that caused the error, you must locate the illuminated error LED on that component.



For example:

A blade error has occurred and you have noted that the blade server blade-error LED is illuminated on the blade server control panel. You then:

1. Remove the blade server from the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 35).
2. Place the blade server on a flat, non-conductive surface.
3. Remove the cover from the blade server (see “Opening the blade server cover” on page 37).
4. Press and hold the Light Path Diagnostics button to relight the LEDs that were lit before you removed the blade server from the BladeCenter unit. The LEDs will remain illuminated for as long as you press the button, to a maximum of 25 seconds.

Use the table at “Light Path Diagnostics” on page 69 to help determine the cause of the error and the action you should take.

Memory errors

If a memory problem occurs, take the following actions before replacing a DIMM:

1. Reseat both DIMMs in the bank.
2. Check for a memory type mismatch in the bank.
3. Run the diagnostic programs.

For more information about memory, see “Installing memory modules” on page 39.

Error symptoms

This section describes methods for troubleshooting other error symptoms.

Error symptom charts

You can use the error symptom charts to find solutions to problems that have definite symptoms (see “Error symptoms” on page 70).

If you cannot find the problem in the error symptom charts, go to “Starting the diagnostic programs” on page 25 to test the blade server.

Small computer system interface messages

This information only applies if a storage expansion unit is available. If you receive a SCSI error message when running the SCSI Select Utility program, see “SCSI error codes” on page 82.

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

Recovering the BIOS code

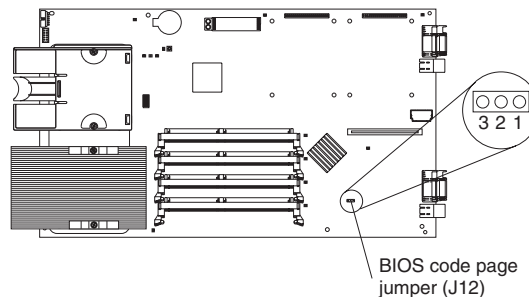
If your BIOS code has become damaged, such as from a power failure during a flash update, the blade server may appear to be nonfunctional (no video, no beeps). You can recover your BIOS code using the BIOS code page jumper (J12) and a BIOS flash diskette.

Note: To obtain a BIOS flash diskette, download a BIOS flash diskette from the World Wide Web. Go to <http://www.ibm.com/pc/support>, click **IBM Server Support**, and make the selections for your server.

The flash memory of your server consists of a primary page and a backup page. The J12 jumper controls which page is used to start the blade server. If the BIOS code in the primary page is damaged, you can use the backup page to start the blade server; then, start the BIOS flash diskette to restore the BIOS code to the primary page.

To recover the BIOS code, complete the following steps:

1. Turn off the blade server.
2. Remove the blade server from the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 35).
3. Remove the cover (see “Opening the blade server cover” on page 37).
4. Locate jumper J12 (BIOS code page jumper) on the system board.



5. Move J12 to pins 2 and 3 to enable BIOS recovery mode.
6. Replace the cover and reinstall the blade server in the BladeCenter unit, making sure the blade server controls all relevant components.
7. Insert the BIOS flash diskette into the diskette drive.
8. Restart the blade server. The system begins the power-on self-test (POST).
9. Select **1 - Update POST/BIOS** from the menu that contains various flash (update) options.
10. When you are prompted whether you want to move the current POST/BIOS image to the backup ROM location, press N.

Attention: If you press Y, the damaged BIOS will be copied into the secondary page.

11. When you are prompted whether you want to save the current code to a diskette, press N.
12. Select your language (0 through 5) and press Enter to accept your choice.
13. **Attention:** Do *not* restart the blade server at this time. Remove the flash diskette from the diskette drive.
14. Turn off the blade server, remove it from the BladeCenter, and remove the cover of the blade server.
15. Move J12 to pins 1 and 2 to return to normal startup mode.
16. Replace the cover and reinstall the blade server in the BladeCenter unit; then restart the blade server. The system starts up.

Statement 21:



CAUTION:

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

Support telephone numbers

View support telephone numbers at <http://www.ibm.com/planetwide/> on the World Wide Web.

Chapter 4. Customer replaceable units

This chapter provides instructions for adding options to your blade server. Some option-removal instructions are provided in case you need to remove one option to install another.

Installation guidelines

Before you begin to install options in your blade server, read the following information:

- Read the safety information beginning at “Safety information” on page 93 and the guidelines in “Handling electrostatic discharge-sensitive devices” on page 96. This information will help you work safely with your blade server and options.
- Back up all important data before you make changes to disk drives.
- For a list of supported options for your blade server, refer to <http://www.ibm.com/pc/us/compat/> on the World Wide Web.

System reliability considerations

To help ensure proper cooling and system reliability, make sure that microprocessor socket 2 always contains either the microprocessor heat sink filler or a microprocessor and heat sink.

Handling static-sensitive devices

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

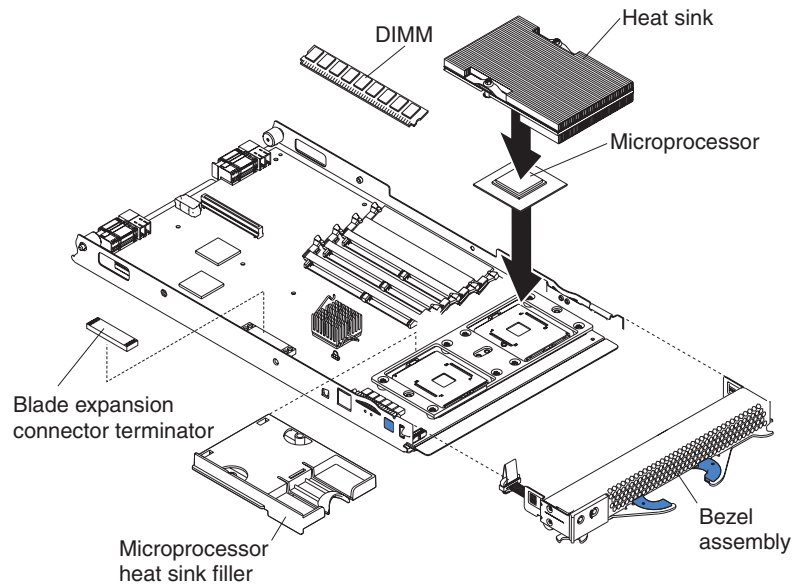
To reduce the possibility of electrostatic discharge, observe the following precautions:

- 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 printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its static-protective package, touch it to an unpainted metal part of the BladeCenter chassis for at least two seconds. (This drains static electricity from the package and from your body.)
- Remove the device from its package and install it directly into your blade server without setting it down. If it is necessary to set the device down, place it in its static-protective package. Do not place the device on your blade server cover or on a metal table.
- Take additional care when handling devices during cold weather because heating reduces indoor humidity and increases static electricity.

Major components of the BladeCenter HS20 Type 8678 blade server

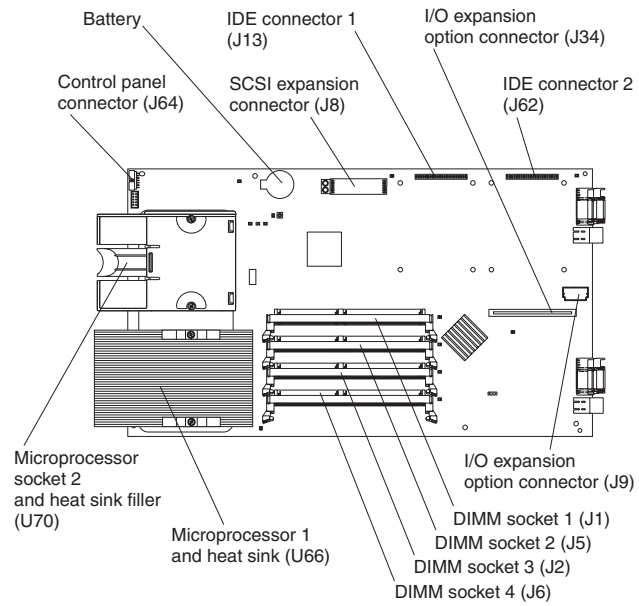
The following illustration shows the locations of major components in your blade server. You need to remove the blade server from the BladeCenter and remove the blade server cover to see the components (See “Opening the blade server cover” on page 37.).

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



System board illustration

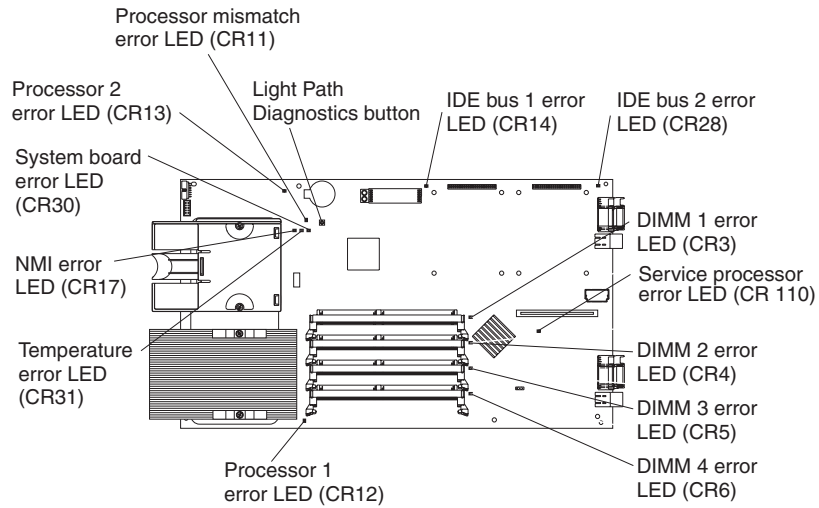
The following illustration shows the location of the system-board components, including connectors for user-installable options.



Note: The SCSI expansion connector requires a terminator on it unless an expansion option is connected to it.

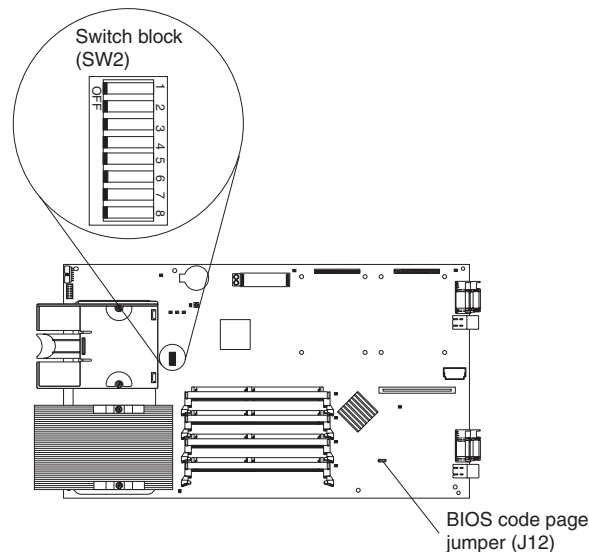
System board LED locations

The following illustration shows the location of the LEDs on the system board. You might need to refer to this illustration when solving problems with the blade server. You need to remove the blade server from the BladeCenter unit, open the cover, and press the Light Path Diagnostics button to light any error LEDs that were turned on during processing. The LEDs will remain lit for a maximum of 25 seconds.



Switches and jumpers

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



Switches

Table 1 describes the function of each switch on the switch block.

Table 1. Switches 1-8

Switch number	Default value	Switch description
8	Off	Power-on password override. Changing the position of this switch bypasses the power-on password check the next time the blade server is turned on and starts the Configuration/Setup Utility program so that you can change or delete the power-on password. You do not need to move the switch back to the default position after the password is overridden. See “Using passwords” on page 11 for additional information about the power-on password.
7	Off	Reserved
6	Off	Reserved.
5	Off	Power-on override. When toggled to On, this switch forces the blade server to turn on, overriding the power-on button.
1 to 4	Off	Reserved.

Jumpers

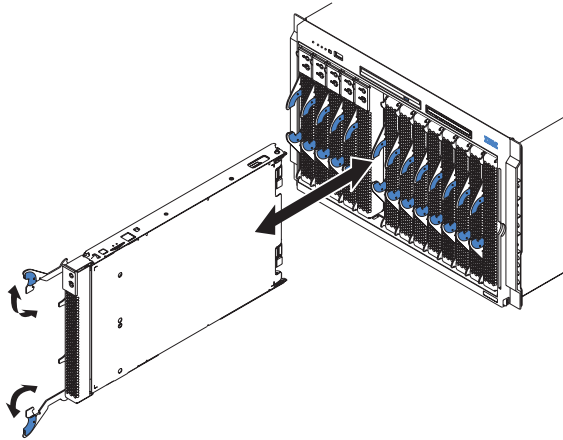
When the BIOS code page jumper (J12) is moved from pins 1 and 2 to pins 2 and 3, you can start the blade server from a backup BIOS page. The default position is pins 1 and 2. See “Recovering the BIOS code” on page 28 for more information.

Note: If you start the blade server from the backup page because the primary BIOS page has become damaged, you need to flash the primary BIOS code.

Removing the blade server from the BladeCenter unit

The following illustration shows how to remove the blade server from the BladeCenter unit.

Note: Do not switch control of the shared CD-ROM drive or diskette drive to another blade server unit the activity lights on both the CD-ROM drive and diskette drive are off, indicating that no read or write operations are in progress.



Attention:

- To maintain proper system cooling, do not operate the BladeCenter unit for more than one minute without a blade server, a filler blade, or an expansion option installed in each blade bay.
- Note the bay number. Reinstalling a blade server into a different bay than the one from which it was removed could have unintended consequences. Some configuration information and update options are established according to bay number; if you reinstall the blade server into a different bay, you might need to reconfigure the blade server (see the *BladeCenter HS20 Type 8678 Installation and User's Guide*).
- If the blade server with active video is removed from the BladeCenter unit, the video defaults to blade server number 14 without lighting the video light on the blade server. There can be only one single active video output from the BladeCenter unit at any one time.

Complete the following steps to remove the blade server:

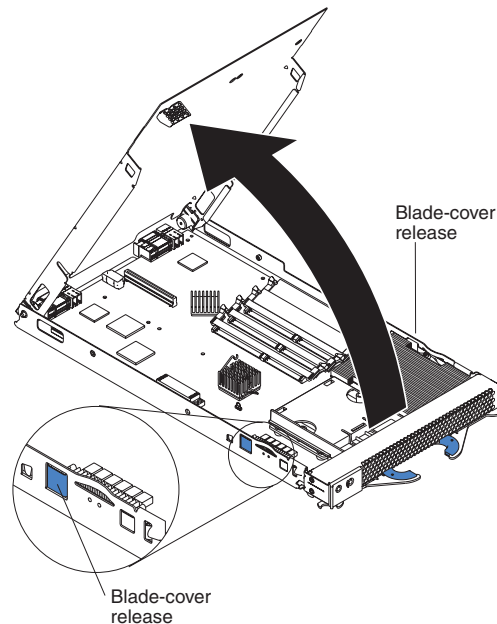
1. Shut down the operating system; then, press the power-control button (behind the blade server control panel door) and turn off the blade server. Wait at least 30 seconds, until the drives stop spinning, before proceeding to the next step. See “Blade server controls and LEDs” on page 5 for more information about the location of the power-control button.

Note: If local power control has been disabled, you can connect to the management module of the BladeCenter unit to shut down the blade server; refer to the IBM *BladeCenter Hardware Maintenance Manual* for more information.

2. Open the two release levers as shown in the illustration. The blade server moves out of the bay approximately 0.6 cm (0.25 inch).
3. Pull the blade server out of the bay. Spring-loaded doors move into place to cover the bay temporarily.
4. Place either a filler blade or another blade in the bay within one minute. The spring-loaded door will move out of the way as you insert the blade or filler blade.

Opening the blade server cover

The following illustration shows how to open the cover on the blade server.



Complete the following steps to open the blade server cover:

1. Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.
2. Lay the blade server down on a flat, static-free surface, with the cover side up.
3. Press the blade-cover release on each side of the blade server and lift the cover open, as shown in the illustration.
4. Lay the cover flat, or lift it from the blade server.

Statement 21:



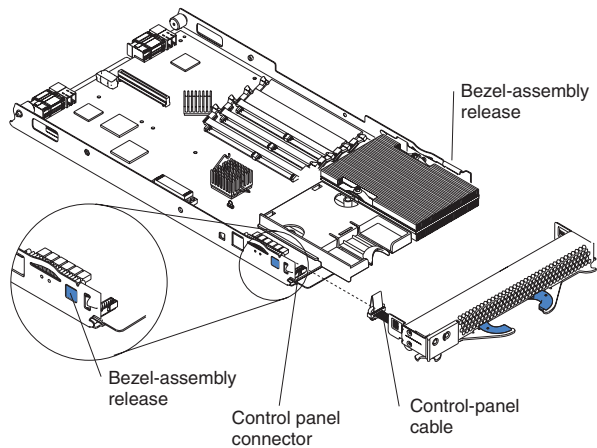
CAUTION:

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

Removing the blade server bezel assembly

To install certain options you must first remove the blade server bezel assembly. The following illustration shows how to remove the bezel assembly from a blade server.

Important: Do not install a drive into IDE connector 2 on the blade server if you intend to also install an I/O expansion option. The I/O expansion option occupies the same area as the second IDE drive. See the *IBM @server BladeCenter HS20 IDE Hard Disk Drive* option documentation, the *IBM @server BladeCenter HS20 I/O Expansion Module* option documentation, and the *IBM @server BladeCenter HS20 Type 8678 Installation and User's Guide* for more information.



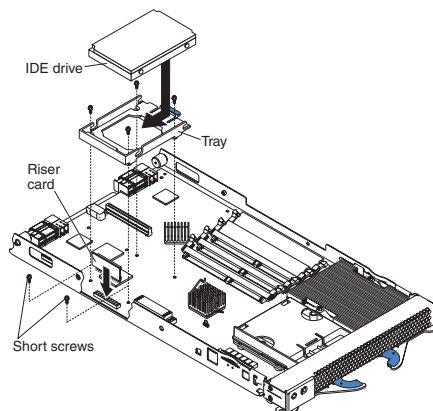
Complete the following steps to remove the blade server bezel assembly:

1. Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.
2. Open the blade server cover.
3. Press the bezel-assembly release and pull the bezel assembly away from the blade server approximately 1.2 cm (0.5 inch).
4. Disconnect the control-panel cable from the control-panel connector.
5. Pull the bezel assembly away from the blade server chassis.
6. Store the bezel assembly in a safe place.

Installing IDE hard disk drives

Your blade server has two connectors on the system board for installing optional 2.5-inch IDE hard disk drives. Each IDE connector is on a separate bus. Some models come with at least one IDE hard disk drive already installed.

Attention: To maintain proper system cooling, do not operate the BladeCenter unit for more than 1 minute without either a blade or a filler blade installed in each blade bay.



Complete the following steps to install a 2.5-inch IDE hard disk drive.

Note: Do not install a drive into IDE connector 2 if you intend to also install an I/O expansion option. The I/O expansion option occupies the same area as the second IDE drive.

1. Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.
2. Shut down the operating system, turn off the blade server, and remove the blade server from the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 35 for instructions).
3. Carefully lay the blade server on a flat, non-conductive surface.
4. Open the blade server cover (see “Opening the blade server cover” on page 37 for instructions).
5. Insert the riser card from the option kit into an IDE connector on the blade server system board.

Important: Drives must be installed in the following order: IDE connector 1 first, then IDE connector 2.

6. Place the hard disk drive tray from the option kit over the riser card as shown in the illustration, aligning the tray with the screw holes on the system board. Two of the screw holes have screws in them.
7. Remove the tray temporarily; then, remove the two screws from the screw holes on the system board and replace the tray. Secure the tray to the system board with screws from the kit.
8. Set any jumpers or switches on the drive.

Important: Both IDE drives must be set to Master.

9. Place the hard disk drive into the tray and push it, from the rear edge of the drive, into the connector on the riser card until the drive moves past the lever at the back of the tray. The drive clicks into place.

Attention: Do not press on the top of the hard disk drive. Pressing the top could damage the drive.

10. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 51.

Installing memory modules

You can increase the amount of memory in your blade server by installing memory-module options. When you install memory, you must install a pair of matched dual inline memory modules (DIMMs).

Important: The DIMM options available for the blade server are 256 MB, 512 MB, and 1 GB. The blade server supports a minimum of 512 MB and a maximum of 4 GB of system memory. The system board contains four DIMM connectors and supports two-way memory interleaving. Install only 2.5 V, 184-pin, double-data-rate (DDR), PC2100, registered synchronous dynamic random-access memory (SDRAM) with error correcting code (ECC) DIMMs. These DIMMs must be compatible with the latest PC2100 SDRAM Registered DIMM specification, which is available from <http://www.jedec.org/> on the World Wide Web. For a list of supported options for the blade server, see <http://www.ibm.com/pc/us/compat/> on the World Wide Web.

Notes:

1. The system board contains four DIMM connectors and supports two-way memory interleaving.
2. The DIMM options available for your blade server are 256 MB, 512 MB, and 1 GB. Your blade server supports a minimum of 512 MB and a maximum of 4 GB of system memory.

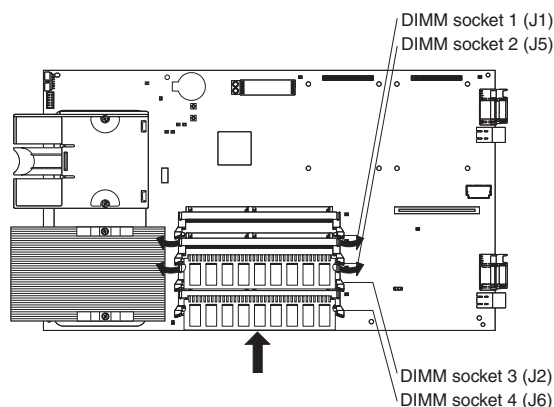
- Your blade server comes with two 256 MB DIMMs installed in the DIMM 3 and DIMM 4 memory connectors (J2 and J6, respectively). When you install additional DIMMs, be sure to install them as a pair, in DIMM connectors 1 and 2 (J1 and J5).

Pair	DIMM connectors
First	3 and 4 (J2, J6)
Second	1 and 2 (J1, J5)

Install the DIMMs in the following order:

- Both DIMMs in a pair must be the same size, speed, type, and technology. You can mix compatible DIMMs from various manufacturers.
- The second pair does not have to be composed of DIMMs of the same size and technology as the first pair.
- Install only 2.5 V, 184-pin, double-data-rate (DDR), PC2100, registered synchronous dynamic random-access memory (SDRAM) with error correcting code (ECC) DIMMs. These DIMMs must be compatible with the latest PC2100 SDRAM Registered DIMM specification, which is available from <http://www.jedec.org/> on the World Wide Web. For a list of supported options for your blade server, see <http://www.ibm.com/us/compat/> on the World Wide Web.
- PC2100 DIMMs are backward-compatible and work in the PC1600 sockets.
- Installing or removing DIMMs changes the configuration information for the blade server. Therefore, after installing or removing a DIMM, you must change and save the new configuration information by using the Configuration/Setup Utility program. When you restart the blade server, the system displays a message indicating that the memory configuration has changed. Start the Configuration/Setup Utility program and select **Save Settings** (see “Configuration/Setup Utility menu choices” on page 9 for more information).

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



Before you begin, read the documentation that comes with your option.

Complete the following steps to install a DIMM:

- Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.
- Shut down the operating system, turn off the blade server, and remove the blade server from the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 35).
- Carefully lay the blade server on a flat, non-conductive surface.

4. Open the blade server cover (see “Opening the blade server cover” on page 37).
5. Locate the DIMM connectors on the system board and determine the connectors into which you will install the DIMMs (see note 3 at “Installing memory modules” on page 39).
6. Touch the static-protective package that contains the DIMM option to any *unpainted* metal surface on the BladeCenter chassis or any *unpainted* surface on any other grounded rack component. Then, remove the DIMM from the package.
7. To install the DIMMs, repeat the following steps for each DIMM that you install:
 - a. Turn the DIMM so that the DIMM keys align correctly with the connector on the system board.

Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.
 - b. Insert the DIMM by pressing the DIMM along the guides into the connector. Be sure that the retaining clips snap into the closed positions.

Important: If there is a gap between the DIMM and the retaining clips, the DIMM has not been properly installed. In this case, open the retaining clips and remove the DIMM; then, reinsert the DIMM.
8. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 51.

Installing an additional microprocessor

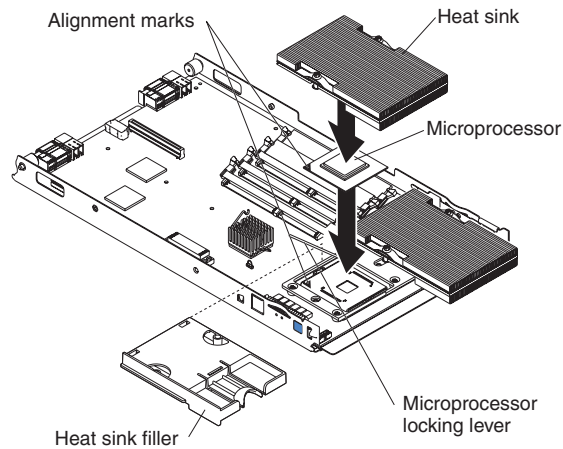
Your blade server comes with one or two microprocessors installed on the system board. Your blade server supports two microprocessors. With two microprocessors, your blade server can operate as a symmetric multiprocessing (SMP) server. With SMP, certain operating systems and application programs can distribute the processing load between the microprocessors. If your blade server comes with one microprocessor, you can install a second microprocessor. To use SMP, obtain an SMP-capable operating system. For a list of supported operating systems and other options, go to <http://www.ibm.com/us/compat/> on the World Wide Web.

Attention: To ensure proper server operation when you install an additional microprocessor, use microprocessors that have the same cache size and type, and the same clock speed. Internal and external clock frequencies must be identical.

Notes:

1. For a list of microprocessors supported by your blade server, see the ServerProven[®] list at <http://www.ibm.com/us/compat/> on the World Wide Web.
2. Thoroughly review the documentation that comes with the microprocessor, so that you can determine whether you need to update the blade server BIOS code. The latest level of BIOS code for your blade server is available from the World Wide Web at <http://www.ibm.com/pc/support> (see Appendix A, “Getting help and technical assistance,” on page 91 for more information).
3. The microprocessor sockets in this server contain built-in termination for the microprocessor bus; therefore, terminator cards are not required for empty microprocessor sockets. However, for proper air flow, an empty microprocessor socket must contain a microprocessor heat sink filler, sometimes called a microprocessor baffle.
4. The microprocessor speeds are automatically set for this server; therefore, you do not need to set any microprocessor frequency-selection jumpers or switches.

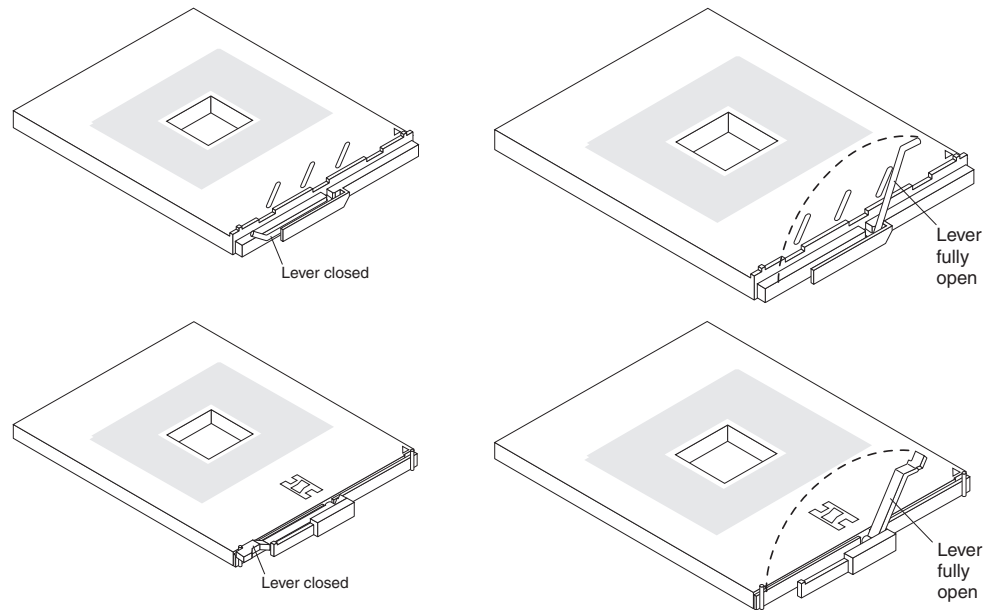
The following illustration shows how to install the second microprocessor on the system board.



Complete the following steps to install an additional microprocessor:

1. Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.
2. Shut down the operating system, turn off the blade server, and remove the blade server from the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 35).
3. Carefully lay the blade server on a flat, non-conductive surface.
4. Open the blade server cover (see “Opening the blade server cover” on page 37).
5. Remove the bezel assembly (see “Removing the blade server bezel assembly” on page 37).
6. Locate the microprocessor socket on the system board.
7. Remove the heat-sink filler.
8. Install the microprocessor:
 - a. Remove the protective cover, tape, label or plastic sheet from the surface of the microprocessor socket, if present.
 - b. Touch the static-protective package containing the new microprocessor to any *unpainted* metal surface on the BladeCenter chassis or any *unpainted* surface on any other grounded rack component; then, remove the microprocessor from the package.
 - c. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops or clicks in the fully open position (approximately 135° angle), as shown.

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



- d. Center the microprocessor over the microprocessor socket. Align the triangle on the corner of the microprocessor with the triangle on the corner of the socket and carefully press the microprocessor into the socket.

Attention:

- Do not use excessive force when pressing the microprocessor into the socket.
- Make sure that the microprocessor is oriented and aligned correctly with pin number 1 in the socket before you try to close the lever.

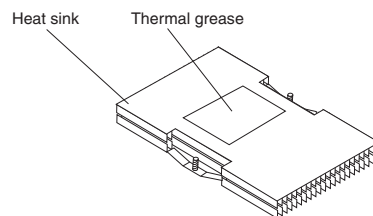
- e. Carefully close the lever to secure the microprocessor in the socket.

9. Install a heat sink on the microprocessor:

- a. Remove the plastic protective cover from the bottom of the heat sink.

Notes:

- 1) Do not set the heat sink down after you remove the plastic cover.



- 2) Do not touch the thermal grease on the bottom of the heat sink. Touching the thermal grease will contaminate it. If the thermal grease on the microprocessor or heat sink becomes contaminated, the thermal grease will have to be cleaned off and replaced by a service technician.

- b. Align and place the heat sink on top of the microprocessor in the retention bracket, grease side down. Press firmly on the heat sink.
- c. Using a screwdriver, secure the heat sink to the retention bracket on the system board using the two captive mounting screws. Press firmly on the screws and tighten them, alternating between them. Do not overtighten the

screws. If you are using a torque wrench, tighten the screws to 1.13 newton-meters +/- 0.13 newton-meters (10 inch-pounds +/- 1.15 inch-pounds).

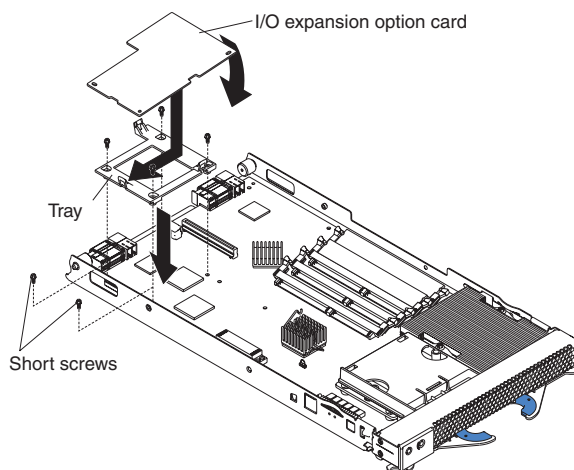
10. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 51.

Installing an I/O expansion option

You can add an I/O expansion option to your blade server to give the blade two additional network connections for communicating on a network.

Attention: When you add an I/O expansion option, you must make sure that the switch modules in switch module bays 3 and 4 on the BladeCenter unit are for the same interface. For example, if you add the IBM HS20 Fibre Channel Expansion Card option to your blade server, the modules in switch module bays 3 and 4 on the BladeCenter unit must be Fibre Channel switches, such as the IBM BladeCenter 2-Port Fibre Channel Switch Module, and all other I/O expansion options installed on other blade servers in the BladeCenter unit must also be Fibre Channel interfaces.

The following illustration shows how to install an I/O expansion option on the blade server. The option is installed near IDE connector 2.



Complete the following steps to install an I/O expansion option:

1. Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.
2. Shut down the operating system, turn off the blade server, and remove the blade server from the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 35 for information).
3. Open the cover (see “Opening the blade server cover” on page 37 for instructions).
4. If an IDE hard disk drive is in IDE connector 2, remove the drive and tray (save the screws that secured the tray to the system board); otherwise, remove the two screws near IDE connector 2 that secure the system board to the chassis, as shown in the illustration.
5. Install the I/O expansion option:
 - a. Install the I/O expansion option tray. Secure the tray to the system board with the screws from the option kit, as shown in the illustration.

- b. Orient the I/O expansion option as shown in the illustration.
- c. Slide the notch in the narrow end of the option into the raised hook on the tray; then, gently pivot the wide end of the option into the I/O expansion option connectors, as shown in the illustration.

Note: For device driver and configuration information to complete the installation of the I/O expansion option, see the documentation that comes with the option. Some documentation might also be on the IBM *BladeCenter Documentation* CD that comes with the BladeCenter unit.

6. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 51.

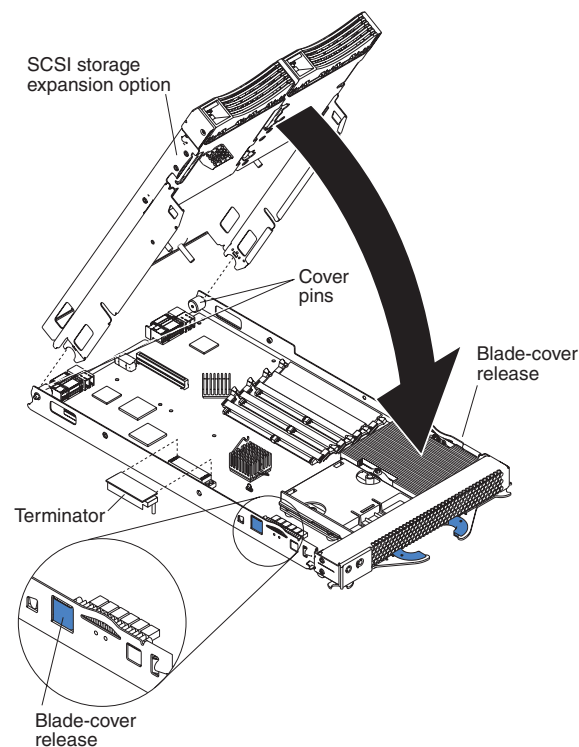
Installing a SCSI storage expansion unit option

To use SCSI hard disk drives with your blade server, you need to install a SCSI storage expansion unit, such as the IBM HS20 SCSI Storage Expansion Unit, on the blade server. You will then be able to install two 1-inch (26 mm) slim-high, 3.5-inch, hot-swap SCSI hard disk drives in the expansion unit, for use by the blade server. The expansion option contains a SCSI controller that supports embedded mirroring, which is similar to RAID level 1.

Note: After you install the SCSI storage expansion unit on your blade server, the blade server and expansion option are a unit that occupies two blade bays in the BladeCenter unit.

For a list of SCSI hard disk drives supported by your blade server, see the ServerProven list at <http://www.ibm.com/us/compat/> on the World Wide Web.

The following illustration shows how to install the SCSI storage expansion unit on the blade server.



Complete the following steps to install the SCSI storage expansion unit:

1. Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.
2. Shut down the operating system, turn off the blade server, and remove the blade server from the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 35 for instructions).
3. Remove the blade server cover.
 - a. Open the blade server cover (see “Opening the blade server cover” on page 37 for instructions) and lift it off the blade server.
 - b. Store the cover in a safe place.
4. Locate the SCSI connector on the system board and remove the terminator from the connector.
5. Install the SCSI storage expansion unit:
 - a. Orient the storage expansion unit as shown in the illustration.
 - b. Lower the storage expansion unit so that the slots at the rear slide down onto the pins at the rear of the blade server.
 - c. Pivot the storage expansion unit closed and press it firmly into place until the cover-release latches click. The connector on the expansion unit automatically aligns with and plugs into the SCSI expansion connector (J8) on the system board.

Statement 21



CAUTION:

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

6. Insert the combined blade and expansion unit into two adjacent BladeCenter bays.

Note: When any blade or option is in blade bay 7 through 14, power modules must be present in power bays 1 and 2, *and* power modules must be present in power bays 3 and 4.

7. Turn on the blade server.
8. If you have not already done so, install the LSI device drivers for your operating system. LSI device drivers are on the Resource CD that comes with the BladeCenter. You can also get the latest version of the drivers from the IBM Support Web site at <http://www.ibm.com/pc/support>.

With the storage expansion unit installed on your blade server, you can install up to two hot-swap SCSI hard disk drives in the option and configure them for embedded mirroring (RAID level1).

Note: The LSI controller does not store the RAID information on the actual drives. If the system board is replaced, the two drives will appear as separate drives with exact copies of the same data. If a new mirror is set up with the same drives, the primary drive will retain its data and will copy everything back onto the secondary drive.

Each SCSI device must have a unique SCSI ID. This ID enables the SCSI controller in the expansion option to identify the device and ensure that different

devices on the same SCSI channel do not attempt to transfer data simultaneously. The SCSI IDs for the hard disk drives in the expansion unit are permanent (not configurable). Table 2 lists the SCSI IDs for the hard disk drives that are installed in the expansion unit. See “Installing a SCSI hot-swap hard disk drive” for instructions for installing hard disk drives.

Table 2. SCSI IDs for standard hot-swap hard disk drives

Device	SCSI ID
Drive bay 1	0
Drive bay 2	1

Note: SCSI ID 7 is usually reserved for the SCSI controller; however, the SCSI ID is changeable through the ServeRAID™ configuration program or the LSI configuration program utility that comes with the BIOS of the blade server.

Use the Configuration/Setup Utility program in the blade server to enable or disable the SCSI controller in the storage expansion unit. Use the documentation that comes with the storage expansion unit for information about configuring the storage expansion unit and SCSI hard disk drives.

Installing a SCSI hot-swap hard disk drive

If you have installed a SCSI storage expansion unit on the blade server, you can install up to two SCSI hot-swap hard disk drives in the bays on the storage expansion unit option.

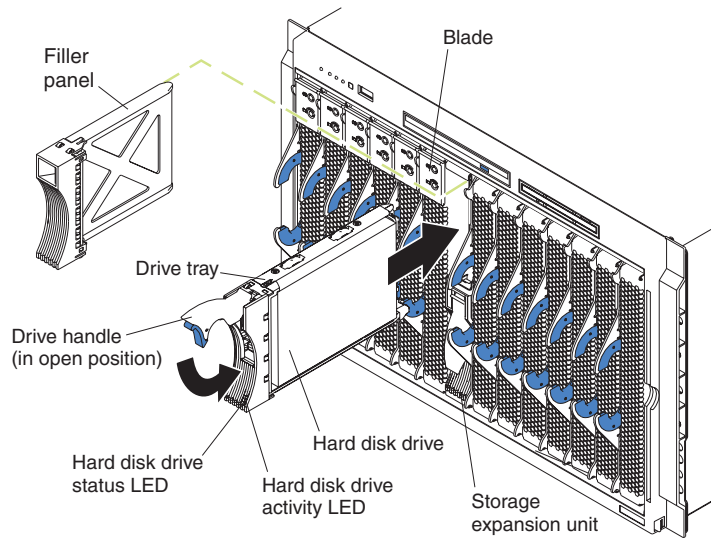
If a hot-swap hard disk drive in the storage expansion unit fails, you can replace it without turning off the blade server. Therefore, you have the advantage of continuing to operate your blade server while a hard disk drive in this unit is removed or installed.

Each hot-swap drive has two indicator LEDs. If the amber hard disk drive status LED for a drive is lit continuously, that drive is faulty and requires replacement.

Each hot-swap drive that you plan to install must be mounted in a hot-swap-drive tray. The drive must have a Single Connector Attachment (SCA) connector. Hot-swap-drive trays come with hot-swap drives.

For a list of SCSI hard disk drives supported by your blade server, see the ServerProven list at <http://www.ibm.com/us/compat/> on the World Wide Web.

The following illustration shows how to install a SCSI hot-swap hard disk drive.



Complete the following steps to install a drive in a storage expansion unit.

Attention: To maintain proper system cooling, do not operate the BladeCenter unit for more than one minute without either a drive or a filler panel installed in each storage expansion unit bay.

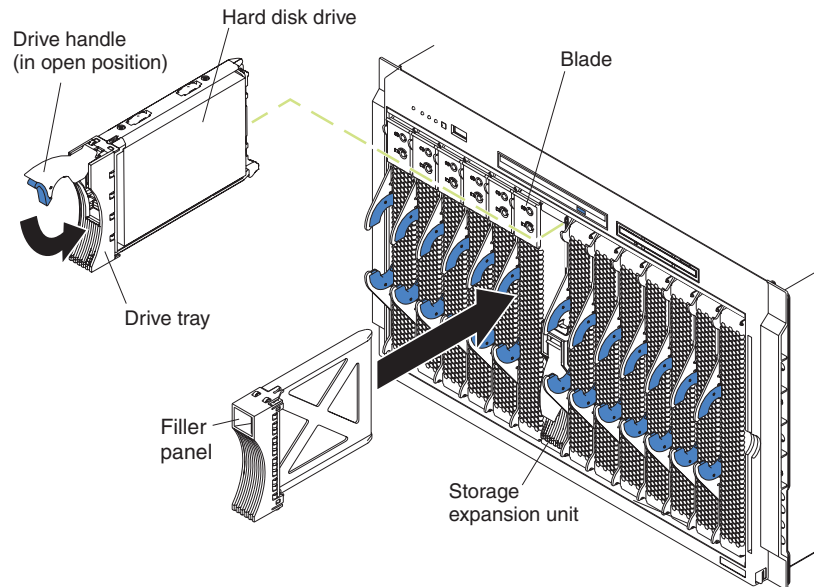
1. Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.
2. Remove the filler panel from one of the empty hot-swap bays by inserting your finger into the depression at the top of the filler panel and pulling it away from the server.
3. Install the hard disk drive:
 - a. Ensure that the tray handle is open (that is, perpendicular to the drive).
 - b. Align the drive assembly with the guide rails in the bay.
 - c. Gently push the drive assembly into the bay until the drive stops.
 - d. Push the tray handle to the closed (locked) position.
 - e. Check the hard disk drive status LED to verify that the hard disk drive is operating properly.

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

See “Using the Configuration/Setup Utility program” on page 9 for information on configuring the blade and storage expansion unit option.

Replacing a SCSI hot-swap hard disk drive

If a hard disk drive in the storage expansion unit fails, you can replace it without turning off the blade server.



Complete the following steps to replace a drive in a storage expansion unit hot-swap bay.

Attention: To maintain proper system cooling, do not operate the BladeCenter unit for more than one minute without either a drive or a filler panel installed in each storage expansion unit bay.

1. Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.
2. Locate the defective drive (look for an amber status LED on the front of the drive).
3. Make sure the drive has stopped spinning.
4. Move the handle on the drive to the open position (perpendicular to the drive), and pull the hot-swap drive assembly from the bay.
5. Within 1 minute, install the replacement hard disk drive in the hot-swap bay (see “Installing a SCSI hot-swap hard disk drive” on page 47 for instructions).

Replacing the battery

IBM has designed this product with your safety in mind. The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.

Note: In the U. S., call 1-800-IBM-4333 for information about battery disposal.

If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.

To order replacement batteries, call 1-800-772-2227 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.

Note: After you replace the battery, you must reconfigure your blade server 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.

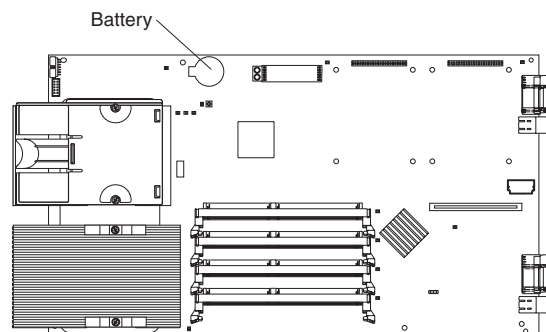
Do not:

- 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.

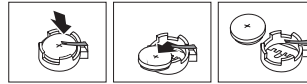
Complete the following steps to replace the battery:

1. Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.
2. Follow any special handling and installation instructions supplied with the battery.
3. Turn off the blade server and remove the blade from the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 35 for instructions).
4. Open the blade server cover (see “Opening the blade server cover” on page 37 for instructions).
5. Locate the battery on the system board.

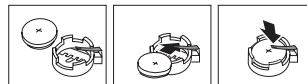


6. Remove the battery:
 - a. Use one finger to lift the battery clip over the battery.
 - b. Use one finger to slightly slide the battery out from its socket. The spring mechanism will push the battery out toward you as you slide it from the socket.

- c. Use your thumb and index finger to pull the battery from under the battery clip.
- d. Ensure that the battery clip is touching the base of the battery socket by pressing gently on the clip.



7. Insert the new battery:
 - a. Tilt the battery so that you can insert it into the socket, under the battery clip.
 - b. As you slide it under the battery clip, press the battery down into the socket.



8. Close the blade server cover (see “Closing the blade server cover” on page 52).
9. Reinsert the blade server into the bay in the BladeCenter unit.
10. Turn on the blade server.
11. Start the blade server Configuration/Setup Utility program and set configuration parameters as needed. See “Using the Configuration/Setup Utility program” on page 9 for information.

Completing the installation

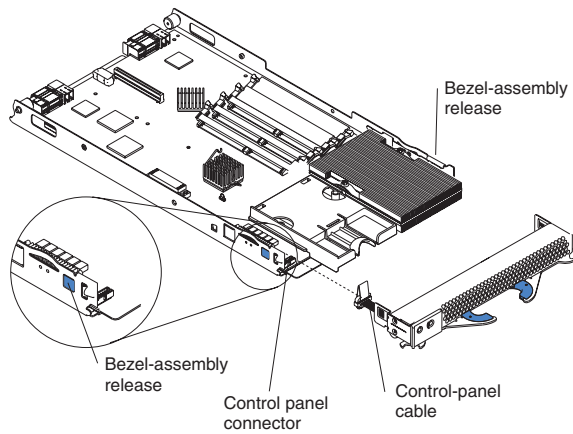
To complete the installation, perform the following tasks. Instructions for each task are in the following sections.

1. Reinstall the blade server bezel assembly if you removed it.
2. Close the blade server cover (or the SCSI storage expansion unit option).
3. Reinstall the blade server into the BladeCenter unit.
4. Turn on the blade server.
5. For certain options, run the blade server Configuration/Setup Utility program.

Note: If you have just plugged the power cords of your BladeCenter into the power distribution unit, you will have to wait until the power-on LED on the blade server flashes slowly before pressing the power-control button on a blade server.

Installing the blade server bezel assembly

The following illustration shows how to install the bezel assembly on the blade server.



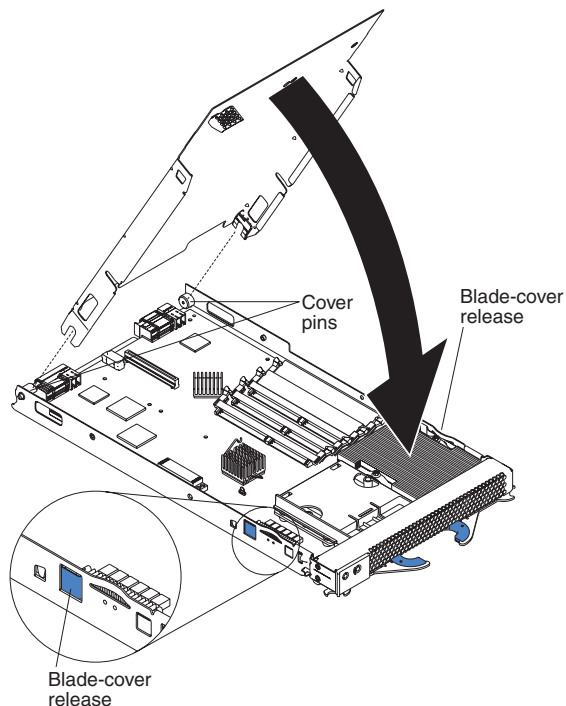
Complete the following steps to install the blade server bezel assembly.

1. Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.
2. Connect the control-panel cable to the control-panel connector on the system board.
3. Carefully slide the bezel assembly onto the blade as shown in the illustration, until it clicks into place.

Closing the blade server cover

Important: The blade server cannot be inserted into the BladeCenter unit until the cover is installed and closed, or a SCSI storage expansion unit is installed. Do not attempt to override this protection.

The following illustration shows how to close the blade server cover.

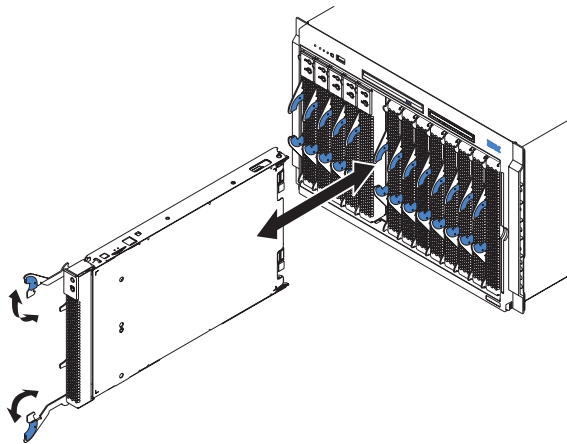


Complete the following steps to close the blade server cover:

1. Review the information in “Safety information” on page 93 and “Installation guidelines” on page 31.

2. Verify that you have completed installing any necessary options.
3. If you removed the blade bezel assembly, replace it now (see “Installing the blade server bezel assembly” on page 51).
4. Lower the cover so that the slots at the rear slide down onto the pins at the rear of the blade server, as shown in the illustration. Before closing the cover, check that all components are installed and seated correctly and that you have not left loose tools or parts inside the blade server.
5. Pivot the cover to the closed position as shown in the illustration, until it clicks into place.

Installing the blade server in the BladeCenter unit



Complete the following steps to install a blade in the BladeCenter unit.

Statement 21:



CAUTION:

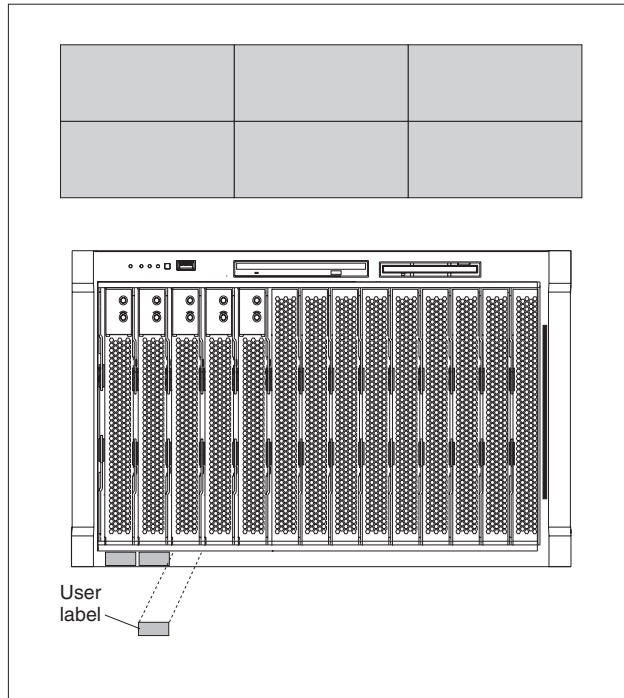
Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

1. Review the information in “Safety information” on page 93, “Handling electrostatic discharge-sensitive devices” on page 96, and “Installation guidelines” on page 31.
2. Verify that all necessary options have been installed in the blade server.
3. Select the bay for the blade server.

Notes:

- a. If the blade server has a SCSI storage expansion unit installed on it, the blade server and expansion option require two adjacent bays.
- b. When any blade or option is in blade bay 7 through 14, power modules must be present in power bays 1 and 2 *and* bays 3 and 4.
4. Ensure that the release levers on the blade server are in the open position (perpendicular to the blade server).
5. Slide the blade server into the bay until it stops. The spring-loaded doors that cover the bay opening move out of the way as you insert the blade server.
6. Push the release levers on the front of the blade server closed.
7. Turn on the blade server (see “Turning on the blade server” on page 4).

8. Verify that the power-on LED on the blade server control panel is lit, indicating that the blade server is receiving power.
9. If desired, write identifying information on one of the user labels that come with the blade server; then, place the label on the BladeCenter bezel just below the blade server, as shown in the following illustration.



Important: Do not place the label on the blade server or in any way block the ventilation holes on the blade server.

10. If you have other blade servers to install, do so now.

Attention: If you reinstall a blade that you removed, you must install it in the same bay from which you removed it.

If this is the initial installation for a blade server in the BladeCenter unit, you need to configure the blade server with the blade server Configuration/Setup Utility and install the blade server operating system (see “Updating your blade server configuration”).

Updating your blade server configuration

When you start your blade server for the first time after you add or remove an internal option or an external SCSI device (if the storage expansion unit has been installed), you might see a message telling you that the configuration has changed. The blade server Configuration/Setup Utility program automatically starts so that you can save the new configuration information (see “Using the Configuration/Setup Utility program” on page 9).

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

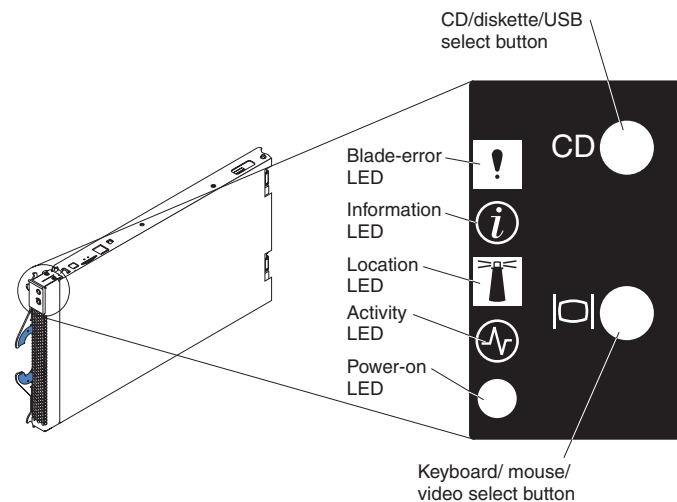
Your blade server comes with one or two microprocessors installed on the system board. If your blade server comes with two microprocessors, or your blade server

comes with one microprocessor and you have installed an additional microprocessor, your blade server can now operate as an SMP server. Therefore, you might need to upgrade your operating system to support SMP. See the IBM BladeCenter HS20 Type 8678 *Installation and User's Guide* and your operating-system documentation for additional information.

Input/output connectors and devices

The input/output connectors available to your blade server are supplied by the BladeCenter unit. See the documentation that comes with your BladeCenter for information about the input/output connectors.

The blade server has two selection buttons on the control panel: `.` and `.`



- To switch the keyboard, video, and mouse to the blade server, press the `.` button.
- To switch the CD-ROM, diskette drive, and USB port to the blade server, press the `.` button.

If there is no response when you press a select button, you can use the management module Web interface to see if local power KVM switching and local media tray switching have been disabled on the blade server.

Important: If you install Microsoft Windows 2000 on a blade server while the blade server is not the current owner of the keyboard, video, and mouse (KVM), a delay of up to one minute occurs the first time you switch the keyboard, video, and mouse to the blade server. During this one-time-only delay, the blade server Device Manager enumerates the keyboard, video, and mouse and loads the device drivers. All subsequent switching takes place in the normal keyboard-video-mouse switching time frame. Make sure the blade server on which you plan to install Windows 2000 is the owner of the KVM before you begin the installation.

The Ethernet controllers on your blade server communicate with the network through the Ethernet switch modules on the BladeCenter unit. Network signals to and from the blade server or any I/O expansion options are automatically routed to a same-network-interface switch module through circuitry in the BladeCenter unit.

Notes:

1. The operating system in the blade server must provide USB support for the blade server to recognize and use the keyboard, mouse, CD-ROM drive, and diskette drive. The BladeCenter unit uses USB for internal communication with these devices.
2. It can take approximately 20 seconds for the operating system in the selected blade server to recognize the CD-ROM drive, diskette drive, and USB port, or the keyboard, video, and mouse.
 - a. The system-error LED might light, and a KVM allocation error might be logged, if the change in ownership for the CD-ROM drive, diskette drive, and USB port, or the keyboard, video, and mouse takes more than 8 seconds. The system-error LED will go off after the ownership change is complete.
 - b. It can take up to 48 seconds after a blade server is initially turned on before you can attempt to switch KVM control to that blade server.
3. If a blade server is under heavy load, it can take several minutes before it enumerates the USB devices connected to it. If control of the KVM and media tray is switched away from the blade server before this enumeration is complete, a USB device installation error might be received. Do not switch KVM control between blade servers until the mouse and keyboard are both working on the blade server that has control of the KVM and media tray.
4. If you install Microsoft Windows 2000 on the blade server while it is not the current owner of the keyboard, video, and mouse, the first time the blade server requests ownership after the operating system has been installed, it can take up to one minute for the operating system to recognize the devices (this is a one-time-only occurrence).

Important:

1. An "Unsafe Removal of Device" error dialog might appear on blade servers running Microsoft Windows 2000. This message might display when control of the CD-ROM drive, diskette drive, and USB port (media tray) is switched to another blade server. You also get this message if the management module restarts the blade server. To continue, click the OK button at the bottom of the error dialog.

Because the BladeCenter unit uses a USB bus to communicate with the media tray devices, switching ownership of the media tray to another blade server is the same as unplugging a USB device.

Before switching ownership of the media tray to another blade server, safely stop the media tray devices on the blade server that currently owns the media tray, as follows:

- a. Double-click the Unplug or Eject Hardware icon in the Windows taskbar at the bottom right of the screen.
- b. Select USB Floppy and click Stop.
- c. Select USB Mass Storage Device and click Stop.
- d. Click Close.

You can now safely switch ownership of the media tray to another blade server.

2. "Media not found" error message and other file system errors might occur on a blade server running Linux or DOS. Attempting to access the mounted CD-ROM drive or diskette drive (media tray) after it has been switched to another blade server results in I/O errors, even if the media tray has been switched back. Because the BladeCenter unit uses a USB bus to communicate with the media tray devices, switching ownership of the media tray to another blade server is the same as unplugging a USB device.

- If a blade server tries to access the CD-ROM after it has been switched to another blade server, a “Media not found” error occurs.
- If a blade server is running a DOS environment, such as when updating firmware on the blade server, the firmware can be interrupted or corrupted when the media tray is switched away; you might need to call for service on the blade server.
- If a file handle was left open by switching the media tray away, the system administrator will not be able to do a clean unmount (umount command) unless the unmount is forced by unmount command parameters (see the online manual entry for the unmount command for information).
- If the system administrator is sharing out the CD-ROM drive for multiple users, that network share is broken.

Before switching ownership of the media tray to another blade server, ensure that the CD-ROM drive and diskette drive are not mounted for the current blade server owner (check for open file handles and sharing out). If a firmware update is taking place on the blade server, DO NOT switch the media tray to another blade server.

To ensure that the media tray is not switched to another server locally, you can use the management module to disable local switching of the media tray. To perform this procedure:

- a. Under Blade tasks, select **Remote Control**.
- b. Under **Redirect Server Console**, check the box **Disable local media tray switching**.
- c. Click on **Save**.

The procedure is documented in the *IBM @server BladeCenter Type 8677 Installation and User's Guide*.

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 “System” on page 90 to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU.

Microprocessor removal

Note:

- Read “Installation guidelines” on page 31.
- Read the safety notices at “Safety information” on page 93.
- Read “Handling electrostatic discharge-sensitive devices” on page 96.

Complete the following steps to remove a microprocessor:

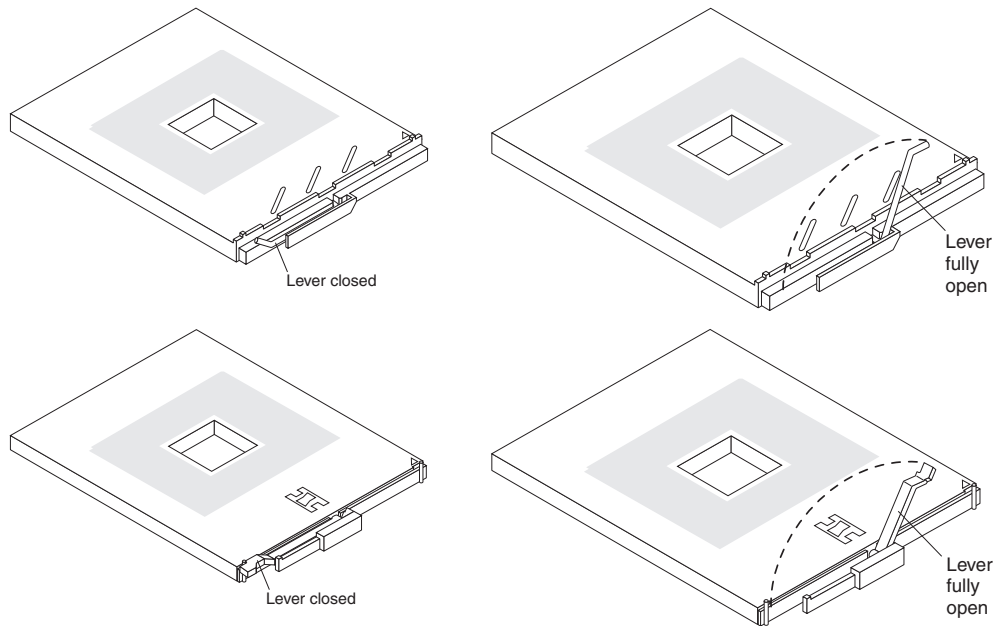
1. Shut down the operating system, turn off the blade server, and remove the blade server from the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 35).
2. Carefully lay the blade server on a flat, non-conductive surface.
3. Open the blade server cover (see “Opening the blade server cover” on page 37 for instructions).
4. Remove the bezel assembly (see “Removing the blade server bezel assembly” on page 37 for instructions).
5. Identify the microprocessor to be removed.

Note: If you are replacing a failed microprocessor, verify that you have selected the correct microprocessor for replacement (see “Light Path Diagnostics” on page 69).

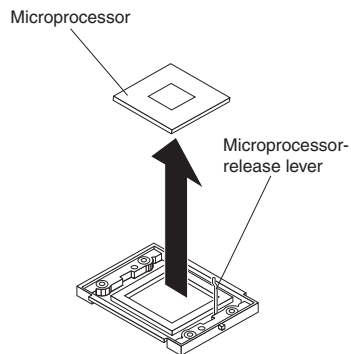
6. Remove the heat sink:
 - a. Loosen one captive screw fully; then, loosen the other captive screw.

Attention: 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. Gently pull the heat sink off of the microprocessor.
7. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops or clicks in the fully open position (approximately 135° angle), as shown. Then, see the documentation provided with the microprocessor option for complete installation instructions.

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



8. Pull the microprocessor out of the socket.



To install a microprocessor, see “Installing an additional microprocessor” on page 41.

Attention: If you are not installing a replacement microprocessor in socket 2, you must reinstall the microprocessor baffle in that socket.

Thermal grease

This section contains information about removing and replacing the thermal grease between the heat sink and the microprocessor. The thermal grease must be replaced anytime the heat sink has been removed from the top of the microprocessor and is going to be reused, or when debris is found in the grease.

Note:

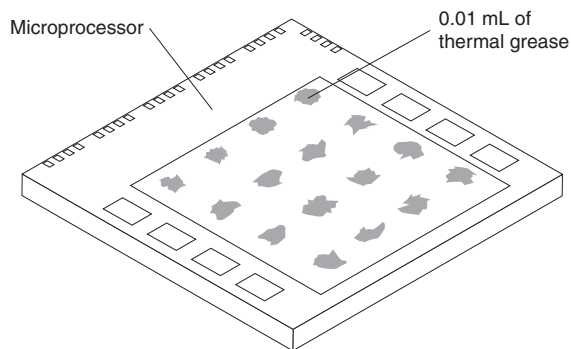
- Read “Installation guidelines” on page 31.
- Read the safety notices at “Safety information” on page 93.
- Read “Handling electrostatic discharge-sensitive devices” on page 96.

Complete the following steps to replace damaged or contaminated thermal grease on the microprocessor and heat sink:

1. Place the heat sink on a clean work surface.
2. Remove the cleaning pad from its package and unfold it completely.
3. Use the cleaning pad to wipe the thermal grease from the bottom of the heat sink.

Note: Be sure that all of the thermal grease is removed.

4. Use a clean area of the cleaning pad to wipe the thermal grease from the microprocessor; then, dispose of the cleaning pad after all of the thermal grease is removed.



5. Use the thermal grease syringe to place 16 uniformly spaced dots of 0.01mL each on the top of the microprocessor.



Note: 0.01mL is one tick mark on the syringe. If the grease is properly applied, approximately half (0.22mL) of the grease will remain in the syringe.

6. Install the heat sink onto the microprocessor as described in “Installing an additional microprocessor” on page 41.

System board

When replacing the system board, you must either update the system with the latest firmware or restore the pre-existing firmware that the customer provides on a diskette or CD image.

Note:

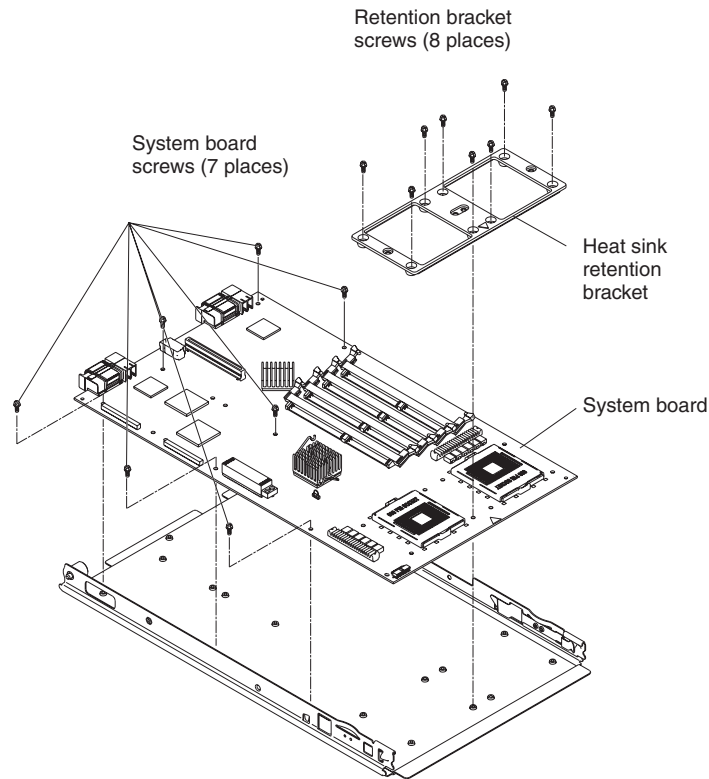
- Read “Installation guidelines” on page 31.
- Read the safety notices at “Safety information” on page 93.
- Read “Handling electrostatic discharge-sensitive devices” on page 96.

Complete the following steps to remove the system board:

1. Shut down the operating system and turn off the blade server (see “Turning off the blade server” on page 4).
2. Remove the blade server from the BladeCenter (see “Removing the blade server from the BladeCenter unit” on page 35).
3. Remove the blade server cover (see “Opening the blade server cover” on page 37) or SCSI storage expansion unit (see “Installing a SCSI storage expansion unit option” on page 45).

4. Remove the blade server bezel assembly (see “Removing the blade server bezel assembly” on page 37).
5. Remove all components (see the appropriate installation instructions and reverse the steps) and place them on a static-protective surface for reinstallation.

Note: The heat sink can be reused. When replacing a microprocessor, be sure to also replace the heat sink. The system board does not ship with a heat sink.



6. Remove the eight screws that secure the heat sink retention bracket to the system board, and put the screws and the module in a safe place.

Notes:

- a. Note the alignment of the heat sink retention bracket (the arrow on the bracket aligns with the arrow on the system board). You will need to align the bracket the same way when reinstalling it.
 - b. One of the screws also helps secure the system board to the blade chassis.
7. Remove the other seven screws that secure the system board to the blade chassis, and put the screws in a safe place.
 8. Pull the system board carefully out of the blade chassis.

Reverse these steps to install the replacement system board.

Note: Two self-adhesive labels ship with the system board. Apply one on top of the existing ethernet MAC address label located on the bottom of the blade chassis. The other label remains with the owner.

Chapter 6. Symptom-to-FRU index

This index supports the HS20 blade servers.

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 21.

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.

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.

Note: In tables with more than two columns, multiple columns are required to describe the error symptoms.

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.

Note: Try reseating a suspected component or reconnecting a cable before replacing the component.

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 the system is functioning properly.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Beep/symptom	FRU/action
1-1-2 (Microprocessor register test failed)	<ol style="list-style-type: none">1. Optional microprocessor (if installed)2. Microprocessor3. System board

Note: See “System” on page 90 to determine which components should 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)	1. DIMM 2. System board
1-2-1 (Programmable Interval Timer failed)	• System board
1-2-2 (DMA initialization failed)	• System board
1-2-3 (DMA page register write/read failed)	• System board
1-2-4 (RAM refresh verification failed)	1. DIMM 2. System board
1-3-1 (first 64K RAM test failed)	1. DIMM 2. System board
1-3-2 (first 64K RAM parity 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
2-2-1 (Interrupt vector loading failed)	• System board
2-2-2 (Keyboard controller failed)	1. Keyboard 2. System board 3. Management module
2-2-3 (CMOS power failure and checksum checks failed)	1. Battery 2. System board
2-2-4 (CMOS configuration information validation failed)	1. Battery 2. System board
2-3-1 (Screen initialization failed)	• System board
2-3-2 (Screen memory failed)	• System board
2-3-3 (Screen retrace failed)	• System board
2-3-4 (Search for video ROM failed)	• System board

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.

Beep/symptom	FRU/action
2-4-1 (Video failed; screen believed operable)	<ul style="list-style-type: none"> • System board
3-1-1 (Timer tick interrupt failed)	<ul style="list-style-type: none"> • System board
3-1-2 (Interval timer channel 2 failed)	<ul style="list-style-type: none"> • System board
3-1-3 (RAM test failed above address OFFFFH)	<ol style="list-style-type: none"> 1. DIMM 2. System board
3-1-4 (Time-Of-Day clock failed)	<ol style="list-style-type: none"> 1. Battery 2. System board
3-2-1 (Serial port failed)	<ul style="list-style-type: none"> • System board
3-2-2 (Parallel port failed)	<ul style="list-style-type: none"> • System board
3-2-3 (Math coprocessor test failed)	<ol style="list-style-type: none"> 1. Microprocessor 2. System board
3-2-4 (Failure comparing CMOS memory size against actual)	<ol style="list-style-type: none"> 1. DIMM 2. System board 3. Battery
3-3-1 (Memory size mismatch occurred.)	<ol style="list-style-type: none"> 1. Verify that both DIMMs in bank are of the same size, speed, type and technology. 2. DIMM 3. System board 4. Battery
3-3-2 (Critical SMBUS error occurred)	<ol style="list-style-type: none"> 1. Power down blade server and reseal it in chassis. 2. DIMMs. 3. System board.
3-3-3 (No operational memory in system) Note: 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 is set to Enabled (its default setting), you must restart the server three times to force the system BIOS code to reset the memory connector or bank of connectors from Disabled to Enabled .	<ol style="list-style-type: none"> 1. Install or reseal the memory modules, and then do a 3 boot reset. (For more information on a 3 boot reset, see “Using the Configuration/Setup Utility program” on page 9.) 2. DIMMs. 3. System board.
Two short beeps (Information only, the configuration has changed)	<ol style="list-style-type: none"> 1. Run Diagnostics. 2. Run the Configuration/Setup Utility program.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Beep/symptom	FRU/action
Three short beeps	<ol style="list-style-type: none"> DIMM System board
One continuous beep	<ol style="list-style-type: none"> Microprocessor Optional microprocessor (if installed) System board
Repeating short beeps	<ol style="list-style-type: none"> Keyboard System board

No-beep symptoms

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
No-beep symptom	FRU/action
No beep and the system operates correctly.	<ol style="list-style-type: none"> System board
No beep and no video (System error LED is OFF)	<ul style="list-style-type: none"> See “Undetermined problems” on page 86.
No beep and no video (System Attention LED is ON)	<ul style="list-style-type: none"> See “Identifying problems using the Light Path Diagnostics” on page 26.

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 might not have occurred.

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

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/action
001-XXX-000 (Failed core tests)	<ul style="list-style-type: none"> System board
001-XXX-001 (Failed core tests)	<ul style="list-style-type: none"> System board
001-250-000 (Failed system board ECC)	<ul style="list-style-type: none"> System board
001-250-001 (Failed processor board ECC)	<ul style="list-style-type: none"> System board
005-XXX-000 (Failed video test)	<ul style="list-style-type: none"> System board
030-XXX-000 (Failed internal SCSI interface test)	<ul style="list-style-type: none"> SCSI storage expansion unit System board

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/action
035-XXX-099	<ol style="list-style-type: none"> 1. No adapters were found. 2. If adapter is installed re-check connection.
075-XXX-000 (Failed power supply test)	<ul style="list-style-type: none"> • Power supply
089-XXX-001 (Failed microprocessor test)	<ol style="list-style-type: none"> 1. Microprocessor 1 2. System board
089-XXX-002 (Failed optional microprocessor test)	<ol style="list-style-type: none"> 1. Optional microprocessor 2 2. System board
165-060-000 (Service Processor: ASM may be busy)	<ol style="list-style-type: none"> 1. Rerun the diagnostic test. 2. Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel. 3. Power down blade server and reseal it in chassis. 4. System board.
165-198-000 (Service Processor: Aborted)	<ol style="list-style-type: none"> 1. Rerun the diagnostic test 2. Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel. 3. Power down blade server and reseal it in chassis. 4. System board.
165-201-000 (Service Processor: Failed)	<ol style="list-style-type: none"> 1. Power down blade server and reseal it in chassis. 2. System board.
165-330-000 (Service Processor: Failed)	<ol style="list-style-type: none"> 1. Update to the latest ROM diagnostic level and retry.
165-342-000 (Service Processor: Failed)	<ol style="list-style-type: none"> 1. Ensure latest firmware levels for ASM and BIOS are installed. 2. Power down blade server and reseal it in chassis. 3. System board.
166-198-000 System Management: Aborted (Unable to communicate with ASM. It may be busy. Run the test again.)	<ol style="list-style-type: none"> 1. Run the diagnostic test again. 2. Correct other error conditions and retry. These include other failed system management tests and items logged in the System Error Log of the management module. 3. Power down blade server and reseal it in chassis. 4. System board.
166-201-001 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> 1. DIMMs 2. System board
166-201-002 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> 1. Reseat I2C cable between the operator information card and the system board. 2. Operator information card. 3. System board.
166-201-003 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> 1. I/O adapter 2. System board
166-201-004 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> 1. SCSI storage expansion unit 2. System board

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/action
166-201-005 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> DIMMs Microprocessors System board
166-342-000 System Management: Failed (ASM adapter BIST indicate failed tests.)	<ol style="list-style-type: none"> Ensure the latest firmware levels for Remote Supervisor Adapter and BIOS are installed. Power down blade server and reseal it in chassis. Remote Supervisor Adapter.
166-400-000 System Management: Failed (ISMP self test result failed tests: x where x = Flash, RAM, or ROM.)	<ol style="list-style-type: none"> Reflash or update firmware for ISMP. System board.
180-XXX-000 (Diagnostics LED failure)	<ul style="list-style-type: none"> Run diagnostics panel LED test for the failing LED.
180-XXX-001 (Failed front LED panel test)	<ol style="list-style-type: none"> Front bezel with customer interface card System board
180-XXX-002 (Failed diagnostics LED panel test)	<ul style="list-style-type: none"> System board
180-XXX-003 (Failed system board LED test)	<ul style="list-style-type: none"> System board
180-XXX-005 (Failed SCSI backplane LED test)	<ol style="list-style-type: none"> SCSI storage expansion unit System board
201-XXX-0nn (Failed memory test.)	<ol style="list-style-type: none"> DIMM Location slots 1-4 where nn = DIMM location. Note: nn 1=DIMM 1; 2=DIMM 2; 3=DIMM 3; 4=DIMM 4. System board.
201-XXX-999 (Multiple DIMM failure, see error text)	<ol style="list-style-type: none"> See error text for failing DIMMs. System board.
202-XXX-001 (Failed system cache test)	<ol style="list-style-type: none"> Microprocessor 1 System board
202-XXX-002 (Failed system cache test)	<ol style="list-style-type: none"> Microprocessor 2 System board
217-198-XXX (Could not establish drive parameters)	<ul style="list-style-type: none"> SCSI storage expansion unit
217-XXX-000 (Failed hard disk drive test) Note: If RAID is configured, the hard disk drive number refers to the RAID logical array.	<ul style="list-style-type: none"> Hard disk drive 1
217-XXX-001 (Failed hard disk test) Note: If RAID is configured, the hard disk number refers to the RAID logical array.	<ul style="list-style-type: none"> Hard disk drive 2
405-XXX-000 (Failed Ethernet test on controller on the system board)	<ol style="list-style-type: none"> Verify that Ethernet is not disabled in BIOS. System board.

Light Path Diagnostics

Lit LED	Cause	Action
None	An error has occurred and cannot be isolated, or the service processor has failed.	An error has occurred that is not represented by a Light Path Diagnostics LED. Check the system error log for more information about the error.
DIMM x error	A memory error occurred.	Reseat the DIMM indicated by the lit DIMM failure LED. If the problem remains, replace the DIMM. Note: Multiple DIMM LEDs do not necessarily indicate multiple DIMM failures. If more than one DIMM LED is on, reseat/replace one DIMM at a time until error goes away. Refer to the BladeCenter management module system error log for further isolation.
Processor x error	The microprocessor has failed.	Verify that the microprocessor indicated by the lit LED is installed correctly. (See "Installing an additional microprocessor" on page 41 for installation instructions.) If the problem remains, replace the microprocessor.
Temperature error	The system temperature has exceeded a threshold level.	<ol style="list-style-type: none"> 1. Check to see if a blower on the BladeCenter unit has failed. If it has, replace the blower. 2. Make sure the room temperature is not too high. (See "Features and specifications" on page 3 for temperature information.)
Voltage error	The integrated VRM on the blade server system board has failed.	<ol style="list-style-type: none"> 1. To verify error, replace the blade server cover, reinsert the blade server in the BladeCenter unit, and then restart the blade server. 2. Replace system board.
IDE bus x error	The IDE bus indicated by the error LED has failed.	<ol style="list-style-type: none"> 1. Reseat/replace the hard disk drive on IDE bus x. 2. Replace the system board.
NMI error	A non-maskable interrupt has occurred.	<ol style="list-style-type: none"> 1. Replace the blade server cover, reinsert the blade server in the BladeCenter unit, and then restart the blade server. 2. Check the system error log for information about the error. <p>If the problem remains, replace the system board.</p>
CPU mismatch	The processors do not match.	Verify that microprocessors 1 and 2 have the same cache size and type, and the same clock speed (internal and external clock frequencies must be identical); also see "Power problems" at "Error symptoms" on page 70.

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” on page 25 to test the server.

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

- Remove the software or device that you just added.
- Run the diagnostic tests to determine if your 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 “System” on page 90 to determine which components should 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. Verify that: <ul style="list-style-type: none"> • 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.
CD is not working properly.	<ol style="list-style-type: none"> 1. Clean the CD. 2. Run CD-ROM drive diagnostics. 3. CD-ROM drive.
CD-ROM drive tray is not working. (The computer must be turned on.)	<ol style="list-style-type: none"> 1. Insert the end of a straightened paper clip into the manual tray-release opening. 2. Run CD-ROM drive diagnostics. 3. CD-ROM drive.
CD-ROM drive is seen as /dev/sr0 by SuSE. (If the SuSE Linux operating system is installed remotely onto a blade server that is not the current owner of the media tray (CD-ROM drive, diskette drive, and USB port), SuSE sees the CD-ROM drive as /dev/sr0 instead of /dev/cdrom.)	<ul style="list-style-type: none"> • Establish a link between /dev/sr0 and /dev/cdrom as follows: <ol style="list-style-type: none"> 1. Enter the following command: <pre>rm /dev/cdrom; ln -s /dev/sr0 /dev/cdrom</pre> 2. Insert the following line in the /etc/fstab file: <pre>/dev/cdrom /media/cdrom auto ro,noauto,user,exec 0 0</pre>

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
CD-ROM drive problems	
Symptom	FRU/action
CD-ROM drive is not recognized after being switched back to blade server running Windows 2000 Advanced Server with SP3 applied. (When the CD-ROM drive is owned by blade server x, is switched to another blade server, then is switched back to blade server x, the operating system in blade server x no longer recognizes the CD-ROM drive. This happens when you have not safely stopped the drives before switching ownership of the CD-ROM drive, diskette drive, and USB port (media tray).)	<p>Note: Because the BladeCenter unit uses a USB bus to communicate with the media tray devices, switching ownership of the media tray to another blade server is the same as unplugging a USB device.</p> <p>Before switching ownership of the CD-ROM drive (media tray) to another blade server, safely stop the media tray devices on the blade server that currently owns the media tray, as follows:</p> <ol style="list-style-type: none"> 1. Double-click the Unplug or Eject Hardware icon in the Windows taskbar at the bottom right of the screen. 2. Select USB Floppy and click Stop. 3. Select USB Mass Storage Device and click Stop. 4. Click Close. <p>You can now safely switch ownership of the media tray to another blade server.</p>

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Diskette drive problems	
Symptom	FRU/action
Diskette drive activity LED stays on, or the system bypasses the diskette drive.	<ol style="list-style-type: none"> 1. If there is a diskette in the drive, verify that: <ul style="list-style-type: none"> • The diskette is inserted correctly in the drive. • The diskette is good and not damaged. (Try another diskette if you have one.) <ul style="list-style-type: none"> – The drive light comes on (one-second flash) when the diskette is inserted. • The diskette contains the necessary files to start the computer. • The diskette drive is enabled in the Configuration/Setup utility program. • The software program is working properly. • The cable is installed correctly (in the proper orientation). 2. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.). 3. Cable. 4. Run diskette drive diagnostics. 5. Diskette drive. 6. Media tray card.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Expansion enclosure problems	
Symptom	FRU/action
The SCSI storage expansion unit used to work but does not work now.	<ol style="list-style-type: none"> 1. Verify that the enclosure is installed correctly. 2. For more information, see your SCSI storage expansion unit documentation.

Note: See “System” on page 90 to determine which components should 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.
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 computer 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 “System” on page 90 to determine which components should be replaced by a field service technician.	
General problems	
Symptom	FRU/action
Problems such as broken cover locks or indicator LEDs not working	<ul style="list-style-type: none"> • Broken CRU/FRU

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Intermittent problems	
Symptom	FRU/action
A problem occurs only occasionally and is difficult to detect.	<ul style="list-style-type: none"> • Verify that: <ul style="list-style-type: none"> – When the computer is turned on, air is flowing from the rear of the computer at the blower grill. If there is no airflow, the blower is not working. This causes the computer to overheat and shut down. – Ensure that the SCSI bus and devices are configured correctly.

Note: See “System” on page 90 to determine which components should 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. Verify that: <ul style="list-style-type: none"> • The keyboard cable is securely connected to the BladeCenter management module, and the keyboard and mouse cables are not reversed. • Both the computer and the monitor are turned on. 2. Keyboard. 3. Management module on the BladeCenter unit; see the IBM <i>BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide</i> on the IBM <i>BladeCenter Documentation CD</i>.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Keyboard, mouse, or pointing-device problems	
Symptom	FRU/action
The mouse or pointing device does not work.	<ol style="list-style-type: none"> Verify that: <ul style="list-style-type: none"> The mouse or pointing-device cable is securely connected to the BladeCenter management module, and that the keyboard and mouse cables are not reversed. The mouse works correctly with other blade servers. The mouse device drivers are installed correctly. Both the computer and the monitor are turned on. The mouse is recognized as a USB device, not PS2, by your blade server. Although the mouse is a PS2-style device, communication with the mouse is through an internal USB bus in the BladeCenter chassis. Some operating systems permit you to select the type of mouse during installation of the operating system. Select USB. Mouse or pointing device. Management module on the BladeCenter unit; see the <i>IBM BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide</i> on the IBM BladeCenter Documentation CD.
Mouse function lost during Red Hat installation.	<p>If, while installing Red Hat Linux 7.3 to a blade server, you or someone else selects a different blade server as owner of the keyboard, video, and monitor (KVM), you might lose mouse function for the installation process.</p> <p>Do not switch KVM owners until the installation process begins to install the packages (after the 'About to Install' window).</p>

Note: See “System” on page 90 to determine which components should 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"> Verify 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 computer might have automatically disabled a DIMM bank when it detected a problem or a DIMM bank could have been manually disabled. 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"> Start the Configuration/Setup Utility program. Enable the DIMM. Save the configuration and restart the computer. DIMM. System board.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Microprocessor problems	
Symptom	FRU/action
The blade server emits a continuous tone during POST. (The startup (boot) microprocessor is not working properly.)	<ol style="list-style-type: none"> 1. Verify that the startup microprocessor is seated properly. 2. Startup microprocessor.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Monitor problems	
Symptom	FRU/action
Testing the monitor.	<ul style="list-style-type: none"> • See the information that comes with the monitor for adjusting and testing instructions. (Some IBM monitors have their own self-tests.)
The screen is blank.	<ol style="list-style-type: none"> 1. Verify that: <ul style="list-style-type: none"> • The system power cord is plugged into the BladeCenter power module 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 computers are C2T chained together, verify that: <ul style="list-style-type: none"> – The C2T chain cables are securely connected to the computers. – The C2T breakout cable is connected properly. – A computer 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 computer three times to force the system BIOS to reset the CMOS values to the default configuration (memory connector or bank of connectors enabled).</p> 2. If you have verified these items and the screen remains blank, replace: <ol style="list-style-type: none"> a. Monitor b. Management module on the BladeCenter (see the <i>IBM BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide</i>).
Only the cursor appears.	<ul style="list-style-type: none"> • Verify that the keyboard, video and mouse on the BladeCenter have not been switched to another blade server. If the problem remains, see “Undetermined problems” on page 86.
The monitor goes blank when you direct it to a working blade server, or goes blank when you start some application programs in the blade servers.	<p>Verify that the monitor cable is connected to the video port on the BladeCenter management module. Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, see the information that comes with the monitor for adjusting and testing instructions.</p> <p>If you still cannot find the problem, try using the monitor with another blade server. If the problem persists, see the <i>IBM BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide</i> on the <i>IBM BladeCenter Documentation CD</i>.</p>

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Monitor problems	
Symptom	FRU/action
The screen is wavy, unreadable, rolling, distorted, or has screen jitter.	<ol style="list-style-type: none"> 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. Notes: <ol style="list-style-type: none"> To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.). Non-IBM monitor cables might cause unpredictable problems. 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. Monitor. System board.
Wrong characters appear on the screen.	<ol style="list-style-type: none"> If the wrong language is displayed, update the firmware or operating system with the correct language in the blade server that has ownership of the monitor. Monitor. System board.
No video.	<ol style="list-style-type: none"> Make sure the correct machine is selected, if applicable. Make sure all cables are locked down.

Note: See “System” on page 90 to determine which components should 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"> Verify that: <ul style="list-style-type: none"> The option is designed for the computer (see the ServerProven list on the World Wide Web at http://www.ibm.com/pc/compat/). 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 and that all option hardware and cable connections are secure. If the failing option is a SCSI storage expansion unit: <ul style="list-style-type: none"> The cables for the SCSI expansion unit are connected correctly. If the SCSI storage expansion unit has been removed, verify that the socket is terminated correctly. The external SCSI expansion unit is turned on. You must turn on the external SCSI expansion unit before turning on the computer. You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration. If the option comes with its own test instructions, use those instructions to test the option. Replace the option you just installed.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.

Power problems	
Symptom	FRU/action
Power switch does not work and reset button, if supported, does work.	<ol style="list-style-type: none"> 1. Reseat connector. 2. Front bezel with customer card. 3. System board.
The blade server does not turn on.	<ol style="list-style-type: none"> 1. Verify that: <ol style="list-style-type: none"> a. The power LED on the front of the BladeCenter unit is on. b. The LEDs on all the BladeCenter power modules are on. c. If the blade server or attached storage expansion unit is in blade bay 7-14, power modules are in power bays 1, 2, 3 and 4. d. The power-on LED on the blade server control panel is blinking slowly. <ul style="list-style-type: none"> • If the power LED is blinking rapidly and continues to do so, the blade server is not communicating with the management module; reseat the blade server, then go to step 3. • If the power LED is off, the blade bay is not receiving power, the blade server is defective, or the LED information panel is loose or defective. e. Local power control for the blade server is enabled (use the BladeCenter management module Web interface to verify), or the blade server was instructed through the management module (Web interface or IBM Director) to turn on. 2. If you just installed an option in the blade server, remove it, and restart the blade server. If the blade server now turns on, you might have installed more options than the power to that blade bay supports. 3. Try another blade server in the blade bay; if it works, replace the faulty blade server. 4. See “Undetermined problems” on page 86.
<p>The blade server does not turn on and the following conditions are present:</p> <ol style="list-style-type: none"> 1. The amber system error LED on the Blade Center unit’s system LED panel is lit; 2. The amber blade error LED on the blade server’s LED panel is lit; and 3. The system error log contains the message “CPUs mismatched”. 	<p>The microprocessor with the lowest feature set and stepping level must be used as the Bootstrap Processor (microprocessor 1 in location U66; see “System board illustration” on page 33). Move the microprocessor in location U66 to location U70, and move the microprocessor in location U70 to location U66.</p>
The blade server turns off for no apparent reason	<ol style="list-style-type: none"> 1. Verify that all blade bays have a blade server, expansion unit, or filler blade properly installed. If these components are missing or improperly installed, an over-temperature condition may result in shutdown. 2. If microprocessor LED is illuminated, replace the microprocessor.
The computer 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 computer fails during BIOS POST and power-control button does not work, remove the blade server from the bay and reseat it. 2. If the problem remains or if you are using an ACPI-aware operating system, suspect the system board.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.

Software problem

Symptom	FRU/action
Suspected software problem.	<ol style="list-style-type: none">To determine if problems are caused by the software, verify that:<ul style="list-style-type: none">The computer 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 computer.Other software works on the computer.The software that you are using works on another system.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.If you have verified these items and the problem remains, contact your place of purchase.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.

Universal Serial Bus (USB) port problems

Symptom	FRU/action
A USB device does not work.	<ul style="list-style-type: none">Verify that:<ul style="list-style-type: none">The correct USB device driver is installed.The operating system supports USB devices.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.

Network connection problems

Symptom	FRU/action
One or more blade servers are unable to communicate with the network.	<p>Verify that:</p> <ul style="list-style-type: none">The switch modules for the network interface being used are installed in the correct BladeCenter bays and are configured and operating correctly. See the <i>IBM BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide</i> on the <i>IBM BladeCenter Documentation</i> CD for details.The settings in the switch module are appropriate for the blade server (settings in the switch module are blade-specific). <p>If you installed an I/O expansion option, verify that:</p> <ul style="list-style-type: none">The option is designed for the blade server.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. <p>If the problem remains, see “Undetermined problems” on page 86.</p>

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.

Service processor problems

Symptom	FRU/action
Service processor in the management module reports a general monitor failure.	Disconnect the BladeCenter unit from all electrical sources, wait for 30 seconds, reconnect the BladeCenter unit to the electrical sources, and restart the server. If the problem remains, see “Undetermined problems” on page 86 and the IBM <i>BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide</i> on the IBM <i>BladeCenter Documentation CD</i>

POST error codes

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

Note: See “System” on page 90 to determine which components should 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)	<ul style="list-style-type: none"> • System board
106 (System and processor error)	<ul style="list-style-type: none"> • System board
111 (Channel check error)	<ol style="list-style-type: none"> 1. Failing adapter 2. DIMM 3. System board
114 (Adapter read-only memory error)	<ol style="list-style-type: none"> 1. Failing adapter. 2. Run diagnostics.
151 (Real time clock error)	<ol style="list-style-type: none"> 1. Run diagnostics. 2. Battery. 3. 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.
162 (Device configuration error) Note: Be sure to load the default settings and any additional desired settings; then, <i>save the configuration.</i>	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. Note: If unable to enter Configuration/Setup Utility program, view system event log in BladeCenter management module. 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.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
165 (Service Processor failure)	<ul style="list-style-type: none"> • System board
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 corrupted)	<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)	<ol style="list-style-type: none"> 1. 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
229 (Cache error)	<ol style="list-style-type: none"> 1. Microprocessor 2. Optional microprocessor (if installed)
262 (DRAM parity configuration error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. 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)	<ul style="list-style-type: none"> • System board
602 (Invalid diskette boot record)	<ol style="list-style-type: none"> 1. Diskette 2. Diskette drive 3. Cable 4. System board
604 (Diskette drive 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.
605 (Unlock failure)	<ol style="list-style-type: none"> 1. Diskette drive 2. Drive cable 3. 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.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
762 (Coprocessor configuration error)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Battery. 3. Microprocessor.
11XX (System board serial port 1 or 2 error)	<ol style="list-style-type: none"> 1. Disconnect the external cable on the serial 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.
1301 (I2C cable to operator information panel not found)	<ol style="list-style-type: none"> 1. Cable 2. Operator information card 3. Power switch assembly 4. System board
1302 (I2C cable from system board to power-on and reset switches not found)	<ol style="list-style-type: none"> 1. Cable 2. Power switch assembly 3. System board
1303 (I2C cable from system board to power backplane not found)	<ol style="list-style-type: none"> 1. Cable 2. Power supply 3. System board
1304 (I2C cable to diagnostic LED board not found)	<ol style="list-style-type: none"> 1. Power switch assembly 2. System board
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 storage expansion unit. 5. System board.
178X (Fixed disk error)	<ol style="list-style-type: none"> 1. Hard disk drive cables. 2. Run diagnostics. 3. Hard disk drive. 4. System board.
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 storage expansion unit. 5. System board.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
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
0001200 (Machine check architecture error)	<ol style="list-style-type: none"> 1. Microprocessor 1 2. Optional microprocessor 2 3. System board
00012000 (Microprocessor machine check)	<ol style="list-style-type: none"> 1. Microprocessor 2. System board
00019501 (Microprocessor 1 is not functioning - check VRM and microprocessor LEDs)	<ol style="list-style-type: none"> 1. Microprocessor 1 2. System board
00019502 (Microprocessor 2 is not functioning – check VRM and microprocessor LEDs)	<ol style="list-style-type: none"> 1. Microprocessor 2 2. System board
00019701 (Microprocessor 1 failed)	<ol style="list-style-type: none"> 1. Microprocessor 1 2. System board
00019702 (Microprocessor 2 failed)	<ol style="list-style-type: none"> 1. Microprocessor 2 2. System board
00151200 (microprocessor machine check)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Microprocessor (check error LED for failing microprocessor). 3. System board.
00180200 (No more I/O space available for adapter)	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program. 2. Failing adapter. 3. System board.
01295085 (ECC checking hardware test error)	<ol style="list-style-type: none"> 1. System board 2. Microprocessor
01298001 (System BIOS installed on this server does not support level of processor)	<ol style="list-style-type: none"> 1. Ensure all microprocessors have the same cache size. 2. Microprocessor 1.
01298002 (System BIOS installed on this server does not support level of processor)	<ol style="list-style-type: none"> 1. Ensure all microprocessors have the same cache size. 2. Microprocessor 2.
01298101 (System BIOS installed on this server does not support level of processor)	<ol style="list-style-type: none"> 1. Ensure all microprocessors have the same cache size. 2. Microprocessor 1.
01298102 (System BIOS installed on this server does not support level of processor)	<ol style="list-style-type: none"> 1. Ensure all microprocessors have the same cache size. 2. Microprocessor 2.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/action
01298200 (Microprocessor speed mismatch)	<ol style="list-style-type: none"> 1. Ensure all microprocessors are the same speed. 2. Microprocessor.
I9990301 (Hard disk sector error)	<ol style="list-style-type: none"> 1. Hard disk drive 2. SCSI backplane 3. Cable 4. System board
I9990305 (Hard disk sector error, no operating system installed)	<ol style="list-style-type: none"> 1. Install operating system to hard disk.
I9990650 (AC power has been restored)	<ol style="list-style-type: none"> 1. Check cable. 2. Check for interruption of power. 3. Power cable.

Service processor error codes

Note: These codes are viewed in the BladeCenter management module log.

When viewed from POST, service processor error codes will appear in hexadecimal form (generally beginning with A2, A3, A4, A5, A6, A7, AD, AE, or E1). However, when viewed from the System Error Log, the messages will appear as text. To determine a possible error condition for the service processor, the System Error Log (see “Viewing error logs from the Configuration/Setup Utility program” on page 23) will refer you to the management module log in the BladeCenter unit.

SCSI error codes

Error code	FRU/action
All SCSI Errors One or more of the following might be causing the problem: <ul style="list-style-type: none"> • A failing SCSI device (adapter, drive) • An improper SCSI configuration • Duplicate SCSI IDs in the same SCSI chain 	<ul style="list-style-type: none"> • Verify that the SCSI devices are configured correctly.

Temperature error messages

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Message	Action
System over temperature for CPU x.	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see “System reliability considerations” on page 31. 2. Replace microprocessor x.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Message	Action
Blade Storage Expansion option over recommended temperature.	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see “System reliability considerations” on page 31. 2. Replace the SCSI hard disk drives. 3. Replace the Blade Storage Expansion option.
CPU x over temperature.	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see “System reliability considerations” on page 31. 2. Replace microprocessor x.

Power error messages

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Message	Action
BSE +12V over recommended voltage	<ol style="list-style-type: none"> 1. Check BladeCenter power (see <i>BladeCenter Hardware Maintenance Manual</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +12V under recommended voltage	<ol style="list-style-type: none"> 1. Reseat blade storage expansion option. 2. Replace blade storage expansion option.
BSE +5V over recommended voltage	<ol style="list-style-type: none"> 1. Reseat blade storage expansion option. 2. Replace blade storage expansion option.
BSE +5V under recommended voltage	<ol style="list-style-type: none"> 1. Reseat blade storage expansion option. 2. Replace blade storage expansion option.
BSE +18V over recommended voltage	<ol style="list-style-type: none"> 1. Reseat blade storage expansion option. 2. Replace blade storage expansion option.
BSE +18V under recommended voltage	<ol style="list-style-type: none"> 1. Reseat blade storage expansion option. 2. Replace blade storage expansion option.
BSE +3.3V over recommended voltage	<ol style="list-style-type: none"> 1. Reseat blade storage expansion option. 2. Replace blade storage expansion option.
BSE +3.3V under recommended voltage	<ol style="list-style-type: none"> 1. Reseat blade storage expansion option. 2. Replace blade storage expansion option.
BSE +2.5V over recommended voltage	<ol style="list-style-type: none"> 1. Reseat blade storage expansion option. 2. Replace blade storage expansion option.
BSE +2.5V under recommended voltage	<ol style="list-style-type: none"> 1. Reseat blade storage expansion option. 2. Replace blade storage expansion option.
BSE +1.8V over recommended voltage	<ol style="list-style-type: none"> 1. Reseat blade storage expansion option. 2. Replace blade storage expansion option.
BSE +1.8V under recommended voltage	<ol style="list-style-type: none"> 1. Reseat blade storage expansion option. 2. Replace blade storage expansion option.

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.

Message	Action
System Power Good fault	<ol style="list-style-type: none"> 1. Check BladeCenter power (see <i>BladeCenter Hardware Maintenance Manual</i>). 2. Reseat blade server. 3. Replace blade server.
VRM Power Good fault	<ol style="list-style-type: none"> 1. Check BladeCenter power (see <i>BladeCenter Hardware Maintenance Manual</i>). 2. Reseat blade server. 3. Replace blade server.
System over recommended voltage for +12v.	<ol style="list-style-type: none"> 1. Check BladeCenter power (see <i>BladeCenter Hardware Maintenance Manual</i>). 2. Reseat blade server. 3. Replace blade server.
System over recommended voltage for +1.25v.	<ol style="list-style-type: none"> 1. Reseat blade server. 2. Replace blade server.
System over recommended voltage for +1.5v.	<ol style="list-style-type: none"> 1. Reseat blade server. 2. Replace blade server.
System over recommended voltage for +2.5v.	<ol style="list-style-type: none"> 1. Reseat blade server. 2. Replace blade server.
System over recommended voltage for +3.3v.	<ol style="list-style-type: none"> 1. Reseat blade server. 2. Replace blade server.
System over recommended 5V fault.	<ol style="list-style-type: none"> 1. Reseat blade server. 2. Replace blade server.
VRM voltage over recommended tolerance.	<ol style="list-style-type: none"> 1. Reseat blade server. 2. Replace blade server.
System under recommended voltage for +12v.	<ol style="list-style-type: none"> 1. Check BladeCenter power (see <i>BladeCenter Hardware Maintenance Manual</i>). 2. Reseat blade server. 3. Replace blade server.
System under recommended voltage for +1.25v.	<ol style="list-style-type: none"> 1. Reseat blade server. 2. Replace blade server.
System under recommended voltage for +1.5v.	<ol style="list-style-type: none"> 1. Reseat blade server. 2. Replace blade server.
System under recommended voltage for +2.5v.	<ol style="list-style-type: none"> 1. Reseat blade server. 2. Replace blade server.
System under recommended voltage for +3.3v.	<ol style="list-style-type: none"> 1. Reseat blade server. 2. Replace blade server.
System under recommended 5V fault.	<ol style="list-style-type: none"> 1. Reseat blade server. 2. Replace blade server.

System shutdown

Refer to the following tables when experiencing system shutdown related to voltage or temperature problems.

System errors

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Message	Action
Internal Error CPU x fault	<ol style="list-style-type: none">1. Reseat I/O Expansion Option.2. Reseat Blade Storage Expansion option.3. Reseat IDE hard drive; then, restart the blade server and watch for the following results:<ol style="list-style-type: none">a. If a PCI device on the blade server has failed, replace PCI device.b. If all PCI devices are functional, continue with step 4.4. Replace microprocessor x.5. Replace I/O Expansion Option.6. Replace Blade Storage Expansion option.7. Replace IDE hard drive.8. Replace system board.

Temperature related system shutdown

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Message	Action
System shutoff due to CPU x over temperature	<ol style="list-style-type: none">1. Ensure that the system is being properly cooled; see “System reliability considerations” on page 31.2. Replace microprocessor x.
System shutoff due to Blade Storage Expansion option temperature	<ol style="list-style-type: none">1. Ensure that the system is being properly cooled; see “System reliability considerations” on page 31.2. Replace Blade Storage Expansion option.
CPU x shut off due to over temperature	<ol style="list-style-type: none">1. Ensure that the system is being properly cooled; see “System reliability considerations” on page 31.2. Replace microprocessor x.
Critical Blower Failure, blade server powering down	<ul style="list-style-type: none">• See BladeCenter <i>Hardware Maintenance Manual</i>.
Power Modules are over temperature, blade server powering down	<ul style="list-style-type: none">• See BladeCenter <i>Hardware Maintenance Manual</i>.

DASD checkout

Note: See “System” on page 90 to determine which components should be replaced by a field service technician.	
Message	Action
Hard drive x removal detected (level-critical; hard drive x has been removed)	<ul style="list-style-type: none">• Information only, take action as appropriate.

Undetermined problems

Note: When troubleshooting a problem with the HS20 Type 8678, it must be determined whether the problem is a blade server problem or a problem with the BladeCenter unit.

- If the BladeCenter unit contains more than one blade server and only one of the blade servers exhibits the problem, it is likely that it is a blade server problem.
- If all of the blade servers exhibit the same symptom, it is probably a BladeCenter unit problem; for more information, see the *IBM BladeCenter Hardware Maintenance Manual*.

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

Notes:

1. Damaged data in CMOS can cause undetermined problems. To reset the CMOS, remove the battery for 15 minutes, and then reinstall the battery.
2. Damaged data in BIOS code can cause undetermined problems.
 - Flash the system with the latest BIOS code.
 - If the system appears inoperative, recover the BIOS (see “Recovering the BIOS code” on page 28).

Check the LEDs on all the power supplies of the BladeCenter unit where the blade server is installed. If the LEDs indicate the power supplies are working correctly, and reseating the blade server does not correct the problem, complete the following steps:

1. Check that the front panel is connected to the system board.
2. If no LEDs on the front panel are working, replace the front panel; then, try to power up the blade server from the BladeCenter web interface (see the BladeCenter documentation for more information).
3. Turn off the blade server.
4. Remove the blade server and remove the cover.
5. Remove or disconnect the following devices (one at a time) until you find the failure (reinstall, turn on and reconfigure the blade server each time):
 - I/O adapter
 - Drives
 - Memory modules (minimum requirement = two 256 MB DIMMs)

Note: Minimum operating requirements are:

- a. System board
 - b. One microprocessor
 - c. Memory (with a minimum of two 256 MB DIMMs)
 - d. A functioning BladeCenter
6. Install and turn on the blade server. If the problem remains, suspect the following FRUs in the order listed:
 - DIMM
 - System board
 - Microprocessor

Notes:

1. If the problem goes away when you remove an I/O adapter from the system and replacing that I/O 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

Due to 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, when, where, single, or multiple systems?
 - Is the failure repeatable?
 - Has this configuration ever worked?
 - If it has been working, what changes were made prior to it failing?
 - 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

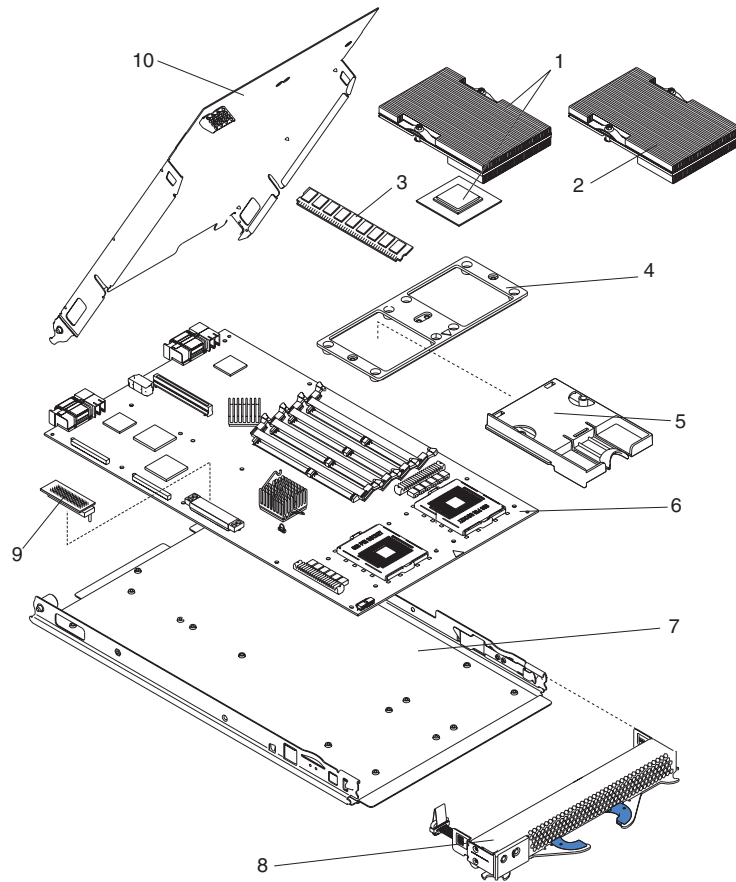
Note: To eliminate confusion, identical systems are considered identical only if they:

1. Are the exact machine type and models
2. Have the same BIOS level
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same diagnostics code (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operation system control files

Comparing the configuration and software set-up between "working" and "non-working" systems will often lead to problem resolution.

Chapter 7. Parts listing, HS20 Type 8678

This parts listing supports the HS20 Type 8678 blade server.



System

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

Index	System	FRU No.	CRU/FRU
1	Microprocessor 400/2.0-0K with heatsink	59P6617	FRU
1	Microprocessor 400/2.4-0K with heatsink	59P6619	FRU
2	Heatsink	49P2611	FRU
3	Memory module, 256 MB PC2100 ECC	09N4306	CRU
3	Memory module, 512 MB PC2100 ECC	09N4307	CRU
3	Memory module, 1 GB PC2100 ECC	09N4308	CRU
4	Retention module	49P2633	FRU
5	Microprocessor heat sink filler	49P2609	CRU
6	System board	59P6610	FRU
7	Chassis assembly (base blade)	49P2658	FRU
8	Front bezel, with customer CD	59P6631	CRU
9	Terminator card	59P6614	CRU
10	Cover with label	49P2612	CRU
	Hard disk drive, 40 GB 5400 RMP 2.5 inch	19K1693	CRU
	Hard disk drive, IDE interposer and tray	56P6630	CRU
	Filler, hard disk drive filler	19K1291	CRU
	Blade storage expansion	59P6632	CRU
	Blade storage expansion base	49P2554	CRU
	Battery, 3.0 volt	33F8354	CRU
	System service label	49P2547	CRU
	Miscellaneous parts kit	02R9003	FRU
	<ul style="list-style-type: none"> • Screw, M3.5x10 Phillips pan head, hard disk drive and adapter card tray (4) • Screw, M3.5 x 5 hex flange, system board (6) • Light pipe, hard disk drive LEDs (2) • Screw, mobile hard disk drive tray, M3 x # slot cap (4) • Screw, 440, D connector (2) • Screw, M3.5 x 7 slotted Phillips hex flange head (8) • Label, customer write-on (1) 		

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.
- 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.
- Use an IBM discussion forum on the IBM Web site to ask questions.

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. Related service 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.

Safety information

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



DANGER

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

To avoid a shock hazard:

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

To Connect	To Disconnect
<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.

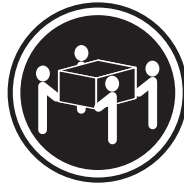
- Statement 4



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

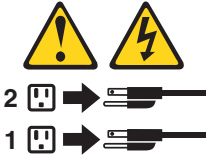
CAUTION:
Use safe practices when lifting.

- 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 is connected to the power source. Always replace the blade cover before installing the blade.

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



PERIGO

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.

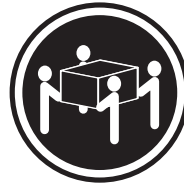
• Instrução 4



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

CUIDADO:

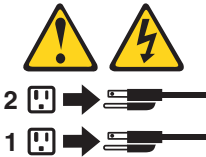
Ao levantar a máquina, faça-o com segurança.

• Instrução 5



CUIDADO:

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



CUIDADO:

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

- Instrução 21



CUIDADO:

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，打开设备机盖前应首先断开与电源线、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:

扔入或浸入水电
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导致激光辐射的危险。



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



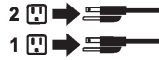
≥18 kg (37 磅) ≥32 kg (70.5 磅) ≥55 kg (121.2 磅)

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。如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，請勿開修該設備的電源。
- 在安裝及架構之時，若非非常熟悉，在開修裝置蓋子之前，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，或開修其蓋子時，請依照下表中「連接」及「切斷」電纜線的步驟執行。

連接：	切斷：
1. 關閉所有開關。	1. 關閉所有開關。
2. 先將所有電纜線接上裝置。	2. 先自電源插座拔掉電源線。
3. 將信號電纜接上接頭。	3. 拔掉接頭上的所有信號電纜。
4. 再將電源線接上電源插座。	4. 再拔掉裝置上的所有電纜線。
5. 開啓裝置的電源。	

聲明 2



注意：

更換電池時，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束下。

聲明 4



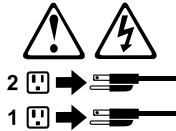
≥ 18 公斤 (37 磅) ≥ 32 公斤 (70.5 磅) ≥ 55 公斤 (121.2 磅)

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



DANGER

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.

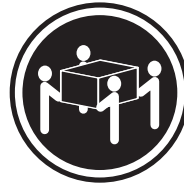
- Notice n° 4



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

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



VORSICHT

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



≥18 kg



≥32 kg



≥55 kg

ACHTUNG:

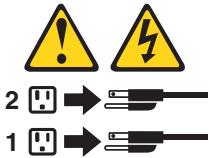
Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

- Hinweis 5



ACHTUNG:

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



ACHTUNG:

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

- Hinweis 21



ACHTUNG:

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



PERICOLO

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.

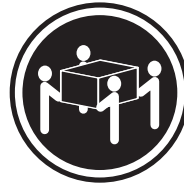
- Avviso 4



≥18 kg



≥32 kg



≥55 kg

ATTENZIONE:

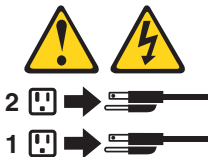
Durante il sollevamento della macchina seguire delle norme di sicurezza.

- 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：

Netfinity 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

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。
3. 次に、通信ケーブルをコネクタに接続する
4. その後、電源コンセントに電源コードを接続する
5. 装置の電源を入れる。

取り外すには

1. すべての電源を切る
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から取り外す。
4. その後、装置からすべてのケーブルを取り外す

・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。

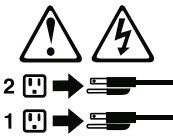
・記述 5

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 켜지 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:	연결을 끊으려면:
1. 모든 스위치를 끕니다.	1. 모든 스위치를 끕니다.
2. 먼저 모든 케이블을 장치에 연결합니다.	2. 먼저 콘센트에서 전원 코드를 뽑습니다.
3. 신호 케이블을 커넥터에 연결합니다.	3. 신호 케이블을 커넥터에서 제거합니다.
4. 콘센트에 전원 코드를 연결합니다.	4. 장치에서 모든 케이블을 제거합니다.
5. 장치 스위치를 켭니다.	

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 유의하십시오.

- 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



PELIGRO

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 señal.
- 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



≥18 kg



≥32 kg



≥55 kg

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.

Appendix C. Notices

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@server	Update Connector
FlashCopy	Wake on LAN
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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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Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

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. For country-specific instructions, refer to the following Web site:
<http://www.ibm.com/ibm/environment/products/prp.shtml>.

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, 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.

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

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

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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

United Kingdom telecommunications safety requirement

Notice to Customers

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

European Union EMC Directive conformance statement

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

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

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
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Part Number: 71P9885

(1P) P/N: 71P9885

