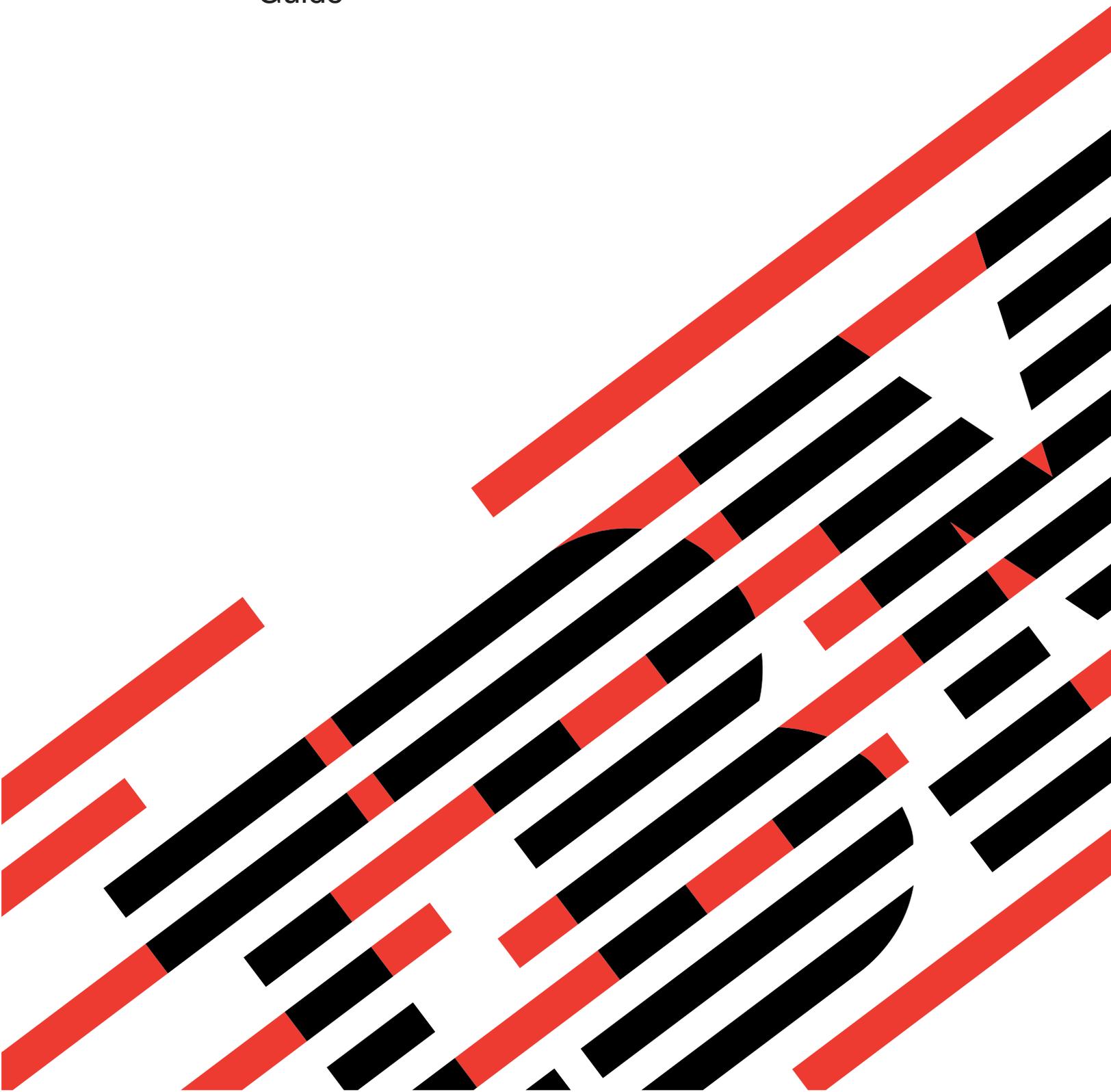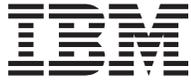# IBM

## @server

BladeCenter HS40
Type 8839

Hardware Maintenance Manual and Troubleshooting Guide

**IBM**

**@server**

BladeCenter HS40
Type 8839

Hardware Maintenance Manual and Troubleshooting
Guide

> **Note:**
> Before using this information and the product it supports, read the information in Appendix C, "Notices," on page 149.

**Fifth Edition (August 2004)**

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

# 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™ HS40 Type 8839 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 Chapter 7, "Parts listing, Type 8839," on page 105 to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU. If a problem with the HS40 blade server is suspected, see "Checkout procedure" on page 21 before taking any further action.

# Important safety information

Be sure to read all caution and danger statements in this book before performing any of the instructions. See Appendix B, "Safety information," on page 109.

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

# Chapter 1. Introduction

The IBM BladeCenter HS40 Type 8839 blade server is based on the IBM Enterprise X-Architecture™ technologies[1].

The HS40 blade server is a double-width blade-model server and can be installed in an IBM @server BladeCenter Type 8677 unit or IBM @server BladeCenter T Types 8720 and 8730 units.

**Note:** Unless otherwise stated, references to the BladeCenter unit also apply to the BladeCenter T unit.

A combination of single-width HS20 blade servers and double-width HS40 blade servers can be installed in the same BladeCenter unit. These high-performance blade servers are ideally suited for networking environments that require superior microprocessor performance, efficient memory management, flexibility, and reliable data storage.

This *Hardware Maintenance Manual and Troubleshooting Guide* and other publications that provide detailed information about your blade server are provided in Portable Document Format (PDF) on the IBM *BladeCenter Documentation* CD.

The machine type, model number, and serial number are on the ID label that is behind the control-panel door on the front of the blade server and on a label on the left side of the blade server that is visible when the blade server is not in the BladeCenter unit. You will need these numbers when you register your blade server with IBM.

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



Release
levels

Release
button
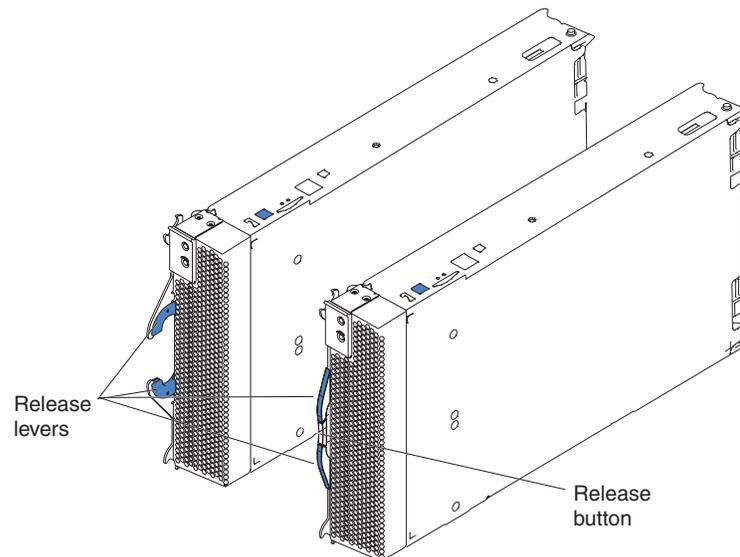
A set of user labels comes with the blade server. When you install the blade server in the BladeCenter unit, write identifying information on a label and place the label on the BladeCenter unit bezel.

---

1. Enterprise X-Architecture technology takes full advantage of existing IBM technologies to build powerful, scalable, and reliable Intel™ processor-based servers. For more information about IBM Enterprise X-Architecture, go to http://www.ibm.com/pc/us/eserver/xseries/xarchitecture/enterprise/index.html.

The following illustration shows the placement of the label, just below the blade server, on the BladeCenter unit.



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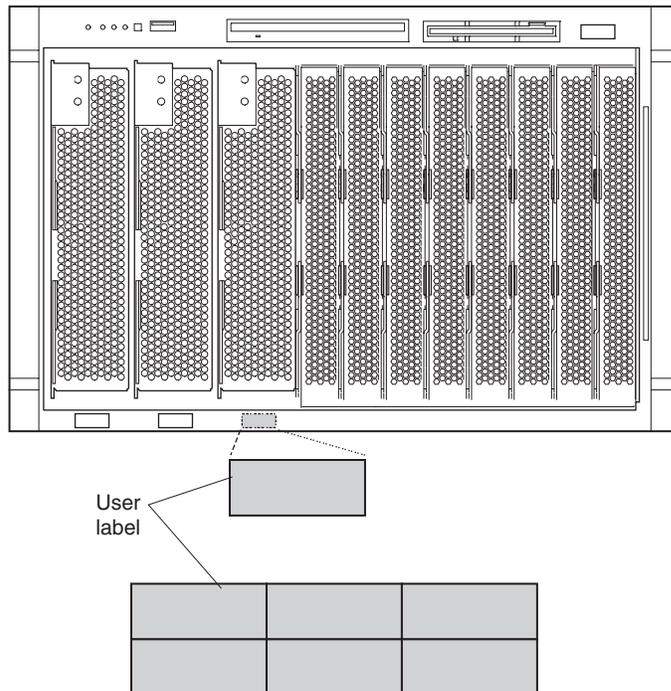
**Important:** Do not place the label on the blade server itself or in any way block the ventilation holes on the blade server.

The following illustration shows the placement of the label, just to the side of the blade server, on the BladeCenter T unit.



User label
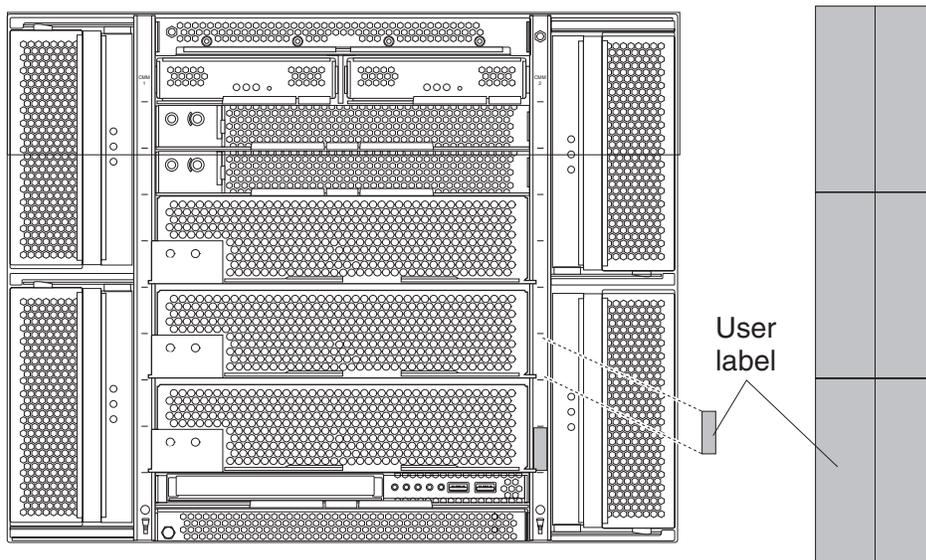
# Related publications

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 documentation is provided in PDF on the IBM *BladeCenter Documentation* CD that comes with your IBM BladeCenter HS40 Type 8839 blade server:

* *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.

* *BladeCenter HS40 Type 8839 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.

* *@server BladeCenter Type 8677 Installation and User's Guide*

  This publication contains instructions for setting up and configuring the BladeCenter unit and basic instructions for installing some options. It also contains general information about the BladeCenter unit.

* *@server BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide*

  This publication contains the information to help you solve BladeCenter problems yourself and information for service technicians.

* *@server BladeCenter Type 8677 Rack Installation Instructions*

  This publication contains instructions for installing the BladeCenter unit in a rack.

* *BladeCenter T Types 8720 and 8730 Installation and User's Guide*

  This document contains instructions for setting up and configuring the BladeCenter T unit and basic instructions for installing some options. It also contains general information about the BladeCenter T unit.

* *BladeCenter T Types 8720 and 8730 Hardware Maintenance Manual and Troubleshooting Guide*

  This document contains information to help you solve BladeCenter T problems yourself, and information for service technicians.

* *BladeCenter T Types 8720 and 8730 Rack Installation Instructions*

  This document contains instructions for installing the BladeCenter T unit in a rack.

* *IBM eServer BladeCenter Serial over LAN Setup Guide*

  This document explains how to update and configure BladeCenter components for Serial over LAN (SOL) operation. The SOL connection provides access to the text-console command prompt on each blade server, enabling the blade servers to be managed from a remote location.

Additional documentation might be included on the IBM *BladeCenter Documentation* CD or the IBM *BladeCenter T Documentation* CD.

# Features and specifications

This section provides a summary of the features and specifications of your blade server. Use the Configuration/Setup Utility program in your server to determine the specific type of microprocessor that is in the blade server.

# BladeCenter HS40 specifications for non-NEBS/ETSI environments

The following table provides a summary of the features and specifications of your BladeCenter HS40 Type 8839 blade server operating in a non-NEBS/ETSI environment.

**Note:** Power, cooling, removable-media drives, external ports, and advanced system management are provided by the IBM @server BladeCenter Type 8677 and IBM @server BladeCenter T Types 8720 and 8730.

| Microprocessor:<br><br>Supports up to 4 microprocessors<br>• Intel Xeon 2.0 GHz or faster<br>• L2 and L3 caches, size dependant on microprocessor<br><br>**Memory:**<br>• Eight double data rate (DDR) PC2100 184-pin DIMM sockets<br>• Minimum: 512 MB<br>• Maximum: 16 GB[1]<br>• Type: 2-way interleaved, DDR, PC2100, ECC SDRAM registered x4 (Chipkill) dual inline memory modules (DIMMs) only<br>• Supports 256 MB, 512 MB, 1 GB, and 2 GB DIMMs<br>• Hot Spare memory<br><br>**Expansion:**<br>Two I/O expansion card connectors<br><br>**Drives:**<br>Support for up to two Ultra320 SCSI hot-swap hard disk drives available in an optional SCSI storage expansion unit | **Size:**<br>• Height: 24.5 cm (9.7 inches)<br>• Depth: 44.6 cm (17.6 inches)<br>• Width: 5.9 cm (2.32 inches)<br>• Maximum weight: 7.0 kg (15.4 lb)<br><br>**Integrated functions:**<br>• Four Gigabit Ethernet controllers<br>• ATI Radeon 7000 video controller<br>• Light path diagnostics<br>• Local service processor<br>• IDE hard disk drive controller (the IDE controller is reserved for future use and is not available for this server type)<br>• RS-485 interface for communication with the management module<br>• Integrated Baseboard Management Controller<br>• Universal Serial Bus (USB) v1.1 for communication with keyboard, mouse, diskette drive, and CD-ROM drive[2]<br>• Serial over LAN (SOL) management interface<br><br>**Electrical input:**<br>Input power: 400 W, maximum | **Predictive Failure Analysis (PFA) alerts:**<br>• Microprocessor<br>• Memory<br>• Hard disk drives<br><br>**Environment:**<br>• Air temperature:<br>– Blade server on: 10° to 35°C (50° to 95°F). Altitude: 0 to 914 m (2998.69 ft)<br>– Blade server on: 10° to 32°C (50° to 95°F). Altitude: 914 m to 2134 m (2998.69 ft to 7000 ft)<br>– Blade server off: -40° to 60°C (-40° to 140° F)<br>• Humidity:<br>– Blade server on: 8% to 80%<br>– Blade server off: 5% to 80% |

**Notes:**

1. You might have to enable large-memory support for your operating system to access all of the memory that is installed in your blade server. See the documentation for your operating system for information.

2. 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 communications with these devices.

# BladeCenter HS40 specifications for NEBS/ETSI environments

The following table provides a summary of the features and specifications of the BladeCenter T HS40 Type 8839 blade server operating in a NEBS/ETSI environment.

**Note:** Power, cooling, removable-media drives, external ports, and advanced system management are provided by the IBM @server BladeCenter T Type 8720.

**Microprocessor:**

Supports up to 4 microprocessors
- Intel Xeon 2.0 GHz or faster
- L2 and L3 caches, size dependant on microprocessor

**Memory:**
- Eight double data rate (DDR) PC2100 184-pin DIMM sockets
- Minimum: 512 MB
- Maximum: 16 GB[1]
- Type: 2-way interleaved, DDR, PC2100, ECC SDRAM registered x4 (Chipkill) dual inline memory modules (DIMMs) only
- Supports 256 MB, 512 MB, 1 GB, and 2 GB DIMMs
- Hot Spare memory

**Expansion:**

Two I/O expansion card connectors

**Drives:**

Support for up to two Ultra320 SCSI hot-swap hard disk drives available in an optional SCSI storage expansion unit

**Size:**
- Height: 24.5 cm (9.7 inches)
- Depth: 44.6 cm (17.6 inches)
- Width: 5.9 cm (2.32 inches)
- Maximum weight: 7.0 kg (15.4 lb)

**Integrated functions:**
- Four Gigabit Ethernet controllers
- ATI Radeon 7000 video controller
- Light path diagnostics
- Local service processor
- IDE hard disk drive controller (the IDE controller is reserved for future use and is not available for this server type)
- RS-485 interface for communication with management module
- Integrated Baseboard Management Controller
- Universal Serial Bus (USB) v1.1 for communication with keyboard, mouse, diskette drive, and CD-ROM drive[2]
- Serial over LAN (SOL) management interface

**Electrical input:**

Input power: 400 W, maximum

**Predictive Failure Analysis (PFA) alerts:**
- Microprocessor
- Memory
- Hard disk drives

**Environment (NEBS):**
- Air temperature:
  - Blade server on: 5° to 40°C (41° to 104°F). Altitude: -60 to 1800 m (-197 to 6000 ft)
  - Blade server on (short term): -5° to 55°C (23° to 131°F) Altitude: -60 to 1800 m (-197 to 6000 ft)
  - Blade server on: 5° to 30°C (41° to 86°F). Altitude: 1800 to 4000 m (6000 to 13 000 ft)
  - Blade server on (short term): -5° to 45°C (23° to 113°F). Altitude: 1800 to 4000 m (6000 to 13 000 ft)
  - Blade server off: -40° to 70°C (-40° to 158°F)
- Humidity:
  - Blade server on: 5% to 80%
  - Blade server on (short term): 5% to 90% but not to exceed 0.024 kg water/kg of dry air
  - Blade server off: uncontrolled

**Note:** "Short term" refers to a period of not more than 96 consecutive hours and a total of not more than 15 days in 1 year. (This refers to a total of 360 hours in any given year, but no more than 15 occurrences during that 1-year period.)

**Notes:**

1. You might have to enable large-memory support for your operating system to access all of the memory that is installed in your blade server. See the documentation for your operating system for information.
2. 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 an external diskette drive. The BladeCenter T unit uses USB for internal communications with these devices.

# 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 reference to the corresponding statement in the safety book.

The following notices and statements are used in the documentation:

- **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.

# Power, controls, and indicators

This chapter 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 blade server to power through the BladeCenter unit, the blade server can start in any of the following ways.

**Note:** Unless otherwise stated, references to the BladeCenter unit also apply to the BladeCenter T unit.

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

  **Notes:**
  1. After you connect the power cords of your BladeCenter unit to the electrical outlets, wait until the power-on LED on the blade server flashes slowly before pressing the blade server power-control button. 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 blade server is starting up, the power-on LED on the front of the server is lit steady. See "Controls and LEDs" on page 8 for the power-on LED states.

- 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.

- 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 under the following conditions:
  - The Wake on LAN feature has not been disabled through the management-module Web interface.
  - The blade server was previously turned on and the operating system was shut down properly.

## Turning off the blade server

When you turn off the blade server, it is still connected to power 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. Improper shutdown of a blade server will prevent that blade server from being restarted using Wake on LAN.

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). 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.

**Note:** After turning off the blade server, wait at least 30 seconds for the hard disk drives to stop spinning before you remove the blade server from the BladeCenter unit.

# Controls and LEDs

This section describes the controls and light-emitting diodes (LEDs) on the blade server. You must open the door to access the controls and LEDs.

**Note:** The control panel door is shown in the closed (normal) position in this illustration. You must open the control panel door to access the power-control button.
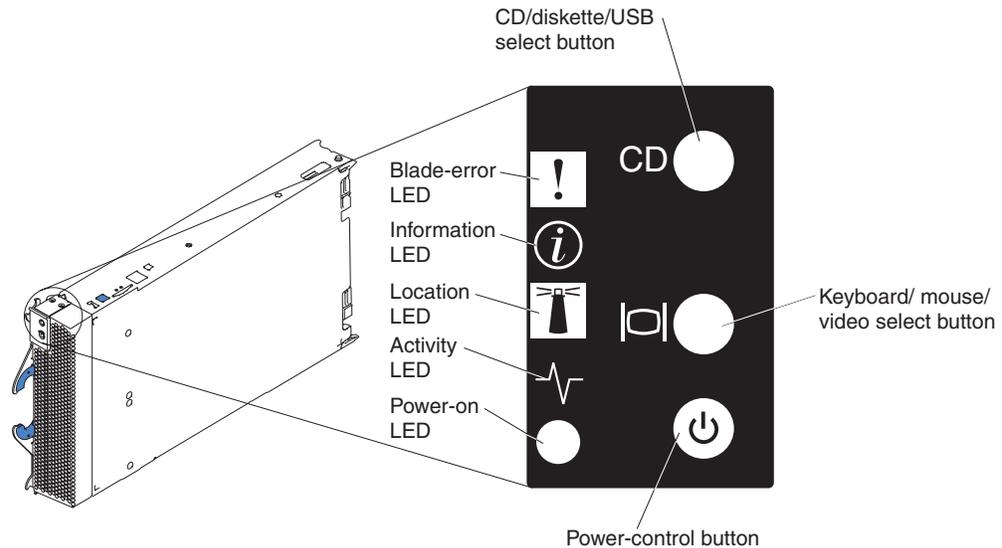


**CD/diskette/USB select button:** Press this button to associate the CD-ROM drive, diskette drive, and USB port with this blade server. The LED on this button flashes while the request is being processed, then is steady when the ownership of the CD-ROM drive, diskette drive, and USB port has been transferred to this blade server. It can take approximately 20 seconds for the operating system in this blade server to recognize the CD-ROM drive, diskette drive, and USB port.

The operating system in the blade server must provide USB support for the blade server to recognize and use the CD-ROM drive, diskette drive, and USB port. The BladeCenter unit uses USB for internal communication with these devices. If there is no response when you press the CD/diskette/USB select button, you can use the management-module Web interface to see whether local control has been disabled on the blade server.

**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. It can take up to 20 seconds to switch the keyboard, video, and mouse control to the blade server.

Although the keyboard that is attached to the BladeCenter unit is a PS/2®-style keyboard, communication with it is through the Universal Serial Bus (USB). The operating system in the blade server must provide USB support for the blade server to recognize and use the keyboard and mouse. The BladeCenter unit uses USB for internal communication with these devices. When you are running an operating system that does not have USB device drivers, the keyboard responds very slowly.

**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.

**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.
- Lit continuously - The blade server has power and is turned on.

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

**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 can be turned off through the BladeCenter management-module Web interface or through the IBM Director Console.
- Running the blade server integrated diagnostics
- Running a BIOS update diskette on a blade server
- Updating the diagnostics on a blade server

If there is no response when you press the keyboard/mouse/video select button, you can use the management-module Web interface to see whether local control has been disabled on the blade server.

You can also press keyboard keys in the following sequence to switch keyboard/mouse/video control between blade servers:

NumLock NumLock *blade server number* Enter

where *blade server number* is the two-digit number for the blade bay in which the blade server is installed. A blade server that occupies more than one blade bay is identified by the lowest bay number that it occupies.

If you install the Microsoft® Windows® 2000 operating system on the blade server while it is not the current owner of the keyboard, video, and mouse, a delay of up to 1 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 (up to 20 seconds).

**Information LED:** When this LED is lit, it indicates that a noncritical event has occurred. A light path diagnostics LED on the processor board or I/O board is also lit to help isolate the error. The information LED can be turned off through the BladeCenter management-module Web interface or through the IBM Director Console.

**Blade-error LED:** When this amber LED is lit, it indicates that a system error has occurred in the blade server. The blade-error LED will turn off only after the error is corrected.

# Chapter 2. Configuring the blade server

The following configuration programs come with your blade server:

- **Configuration/Setup Utility program**

  The Configuration/Setup Utility program 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.

- **IBM ServerGuide Setup and Installation CD**

  The ServerGuide program provides software-setup tools and installation tools that are designed for your blade server. Use this CD during the installation of your blade server to configure basic hardware features, such as a SCSI controller with RAID capabilities, and to simplify the installation of your operating system. For information about using this CD, see "Using the ServerGuide Setup and Installation CD" on page 14.

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

  The PXE boot agent utility program is part of the BIOS code in your server. Use it to change network startup (boot) protocols and startup order and to select operating-system wake-up support. For information about using this utility program, see "Using the PXE boot agent utility program" on page 16.

- **IBM Remote Deployment Manager (RDM) Version 4.11 Update 3 or later**

  IBM Remote Deployment Manager (RDM) is available for purchase. You can use the IBM RDM Version 4.11 Update 3 or later to install a BIOS code update onto the blade server. For information about using this product, see the IBM @server *BladeCenterHS40 Type 8839 Installation and User's Guide*.

  To determine if your operating system supports the RDM program or for updated information about RDM and information about purchasing the software, go to http://www.ibm.com/pc/ww/eserver/xseries/systems_management/index.html.

  For information about setting up your network configuration for remote management, such as with the IBM Director products, depending on your blade server, see the IBM @server *BladeCenter Planning and Installation Guide* or the IBM @server *BladeCenter T Planning and Installation Guide*. You can obtain the planning guides from http://www.ibm.com/pc/support/.

## Using the Configuration/Setup Utility program

This section provides the 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 prompt `Press F1 for Configuration/Setup` appears, press F1.
3. Select settings to view or change.

# Configuration/Setup Utility menu choices

The following choices are on the Configuration/Setup Utility main menu. Depending on the version of the BIOS code in your 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.

  Select **Processor Summary** to view information about the microprocessors installed in the blade server.

- **System Information**

  Select this choice to display information about your blade server, such as: 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). 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.

- **Devices and I/O Ports**

  Select this choice to enable or disable the Ethernet controllers. **Enable** is the default setting for the Ethernet controller. If you disable a device, it cannot be configured, and the operating system will not be able to detect it (this is equivalent to disconnecting the device). If you disable the Ethernet controller, the blade server will have no Ethernet capability.

  – **Remote Console Redirection**

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

  – **System MAC Addresses**

    Select this choice to set and view the MAC addresses for the Ethernet controllers on the blade server.

- **Date and Time**

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

- **System Security**

  Select this choice to set or change the password (see "Using passwords" on page 14 for more information).

- **Start Options**

  Select this choice to view or change the start options. Start options take effect when you start your blade server. You can set keyboard operating characteristics, such as whether the blade server starts with the keyboard number lock on or off. You can also enable a virus-detection test that checks for changes in the boot record when the blade server starts.

  **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 enable the blade server to run without a diskette drive or keyboard. The Extensible Firmware Interface (EFI) start option should not be selected for any of the startup or boot device fields.

If the EFI is accidentally started, after the boot process is complete type Ctrl+Alt+Delete at the `Shell >` prompt; then, press F1 when the prompt `Press F1 for Configuration/Setup` appears and remove EFI as a startup option in the **Startup Options → Startup Sequence** screen.

- **Advanced Setup**

  Select this choice to change settings for advanced hardware features.

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

  - **Memory Settings**

    Select this choice to check memory status and to adjust other memory settings.

    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. After the problem is corrected, you must enable **Retesting of Disabled DIMMs**. This will cause the disabled memory connectors to be retested during POST and enabled if they are operating correctly.

    To maintain optimum system operation in the event of a memory failure, you can enable the **Hot Spare Row** feature. This feature removes the failed memory from the system configuration and activates a Hot Spare Memory pair of DIMMs to replace the failed memory pair of DIMMs. Before you can enable the Hot Spare Memory feature, at least two pairs of DIMMs must be installed in the blade server that adhere to the special requirements described in "Installing memory modules" on page 44.

  - **CPU Options**

    Select this choice to enable or disable hyper-threading and adjust microprocessor performance settings. If enabled, hyper-threading will only be active if it is supported by your operating system.

  - **PCI Bus Control**

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

  - **USB Configuration**

    Select this choice to enable and configure USB devices. All devices in the BladeCenter media tray and the BladeCenter keyboard and mouse are viewed as USB devices by the blade server.

  - **FRB**

    Select this choice to configure the blade server Integrated System Management Processor (ISMP), including how the ISMP responds to POST errors, the time limit for blade server expansion option detection, and blade server microprocessor detection and activation.

- **Error Logs**

  Select this choice to enable and clear the blade server error and event logs. Error and event logs are viewed using the BladeCenter management-module Web interface. See the *BladeCenter Management Module User's Guide* on the IBM *BladeCenter Documentation* CD or the *BladeCenter T Management Module User's Guide* on the IBM *BladeCenter T Documentation* CD for information and instructions.

- **Save Settings**

  Select this choice to save the changes you have made in the settings and exit from the Configuration/Setup Utility program.

- **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 without saving the changes you might have made in the settings.

## Using passwords

From the **System Security** choice, you can set, change, and delete the supervisor password. You can also set when this password needs to be entered. If you set the password to **Power-on**, you must type the password to complete the system startup. Setting the password to **Setup** restricts access to the Configuration/Setup Utility program.

You can use any combination of up to six 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 password, change the position of the power-on password clear switch (switch 2 on switch block S6H1 on the I/O board) to clear the power-on password. Shut down the operating system, turn off the blade server, and remove the blade server from the BladeCenter unit to access the switches. After you change the position of the switch, you can start the Configuration/Setup Utility program and change the power-on password the next time the server is turned on. Move the switch back to the previous position after the password is changed. See "Switches and jumpers" on page 38 for the location of switch block 2.

## Using the ServerGuide Setup and Installation CD

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

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

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

The ServerGuide program has the following features to make setup easier:
- An easy-to-use interface
- Diskette-free setup, and configuration programs that are based on detected hardware
- ServeRAID Manager program, which configures your SCSI controller with RAID capabilities

- Device drivers that are provided for your blade server model and detected hardware
- Operating-system partition size and file-system type that are selectable during setup

## ServerGuide features

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

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

The ServerGuide program has the following features:
- Sets system date and time
- Detects the SCSI RAID adapter, controller, or integrated SCSI controller with RAID capabilities and runs the SCSI RAID configuration program (with LSI chip sets for ServeRAID adapters only)
- Checks the microcode (firmware) levels of a ServeRAID adapter and determines whether a later level is available from the CD
- Detects installed hardware options and provides updated device drivers for most adapters and devices
- Provides diskette-free installation for supported Windows operating systems
- Includes an online readme file with links to tips for your hardware and operating-system installation

## Setup and configuration overview

When you use the *ServerGuide Setup and Installation* CD, you do not need setup diskettes. You can use the CD to configure any supported IBM blade server model. The setup program provides a list of tasks that are required to set up your blade server model. On a blade server with an optional SCSI storage expansion unit, you can run the SCSI RAID configuration program to create logical drives.

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

When you start the *ServerGuide Setup and Installation* CD, the program prompts you to complete the following tasks:
- Select your language.
- Select your keyboard layout and country.
- View the overview to learn about ServerGuide features.
- View the readme file to review installation tips for your operating system and adapter.
- Start the operating-system installation. You will need your operating-system CD.

## Typical operating-system installation

You can use the ServerGuide program to shorten your installation time. The ServerGuide program provides the device drivers that are required for your hardware and for the operating system that you are installing. This section describes a typical ServerGuide operating-system installation.

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

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

## Installing your operating system without ServerGuide

If you have already configured the blade server hardware and you decide not to use the ServerGuide program to install your operating system, complete the following steps to download the latest operating-system installation instructions from the IBM Support Web page:

1. Go to http://www.ibm.com/pc/support/.
2. In the **Download** section, click **Downloads & drivers**.
3. On the "Downloads and drivers" page, in the **Brand** field, select **Servers**.
4. In the **Family** field, select **BladeCenter HS40**.
5. Click **Continue**.
6. In the **View by document type** field, select **OS installation**.
7. Select the instructions for your operating system.

## Using the PXE boot agent utility program

This program is a built-in, menu-driven configuration utility program that you can use to select the boot protocol and other boot options and select a power management option.

**Note:** The remote program load (RPL) selection for the boot protocol option is not supported for this server.

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

1. Turn on the server.
2. When the `Broadcom NetXtreme Boot Agent vX.X.X` prompt appears, press Ctrl+S. You have 2 seconds (by default) to press Ctrl+S after the prompt appears.
   If the PXE setup prompt is not displayed, use the Configuration/Setup Utility program to enable the Ethernet PXE/DHCP option.
3. Use the arrow keys and press Enter to select a choice from the menu.
4. Follow the instructions on the screen to change the settings of the selected items; then, press Enter.

# Firmware updates

IBM will periodically make firmware updates available for your blade server. Use the following table to determine the methods you can use to install these firmware updates.

| Firmware | Update diskette | RDM | Update *Xpress* | Management-module Web interface | Switch-module Web interface | Switch-module Telnet interface |
|---|---|---|---|---|---|---|
| Blade server BIOS code | Yes | Yes | Yes | No | No | No |
| Blade server diagnostic code | Yes | Yes [1] | Yes | No | No | No |
| Blade server service processor code | Yes | Yes | Yes | Yes | No | No |
| [1] You must set up a custom task. | | | | | | |

**Important:** To avoid problems and to maintain proper system performance, always make sure that the blade server BIOS code, service processor firmware, and diagnostic firmware levels are consistent for all blade servers within the BladeCenter unit.

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 @server *BladeCenter Type 8677 Installation and User's Guide* on the IBM *BladeCenter Documentation* CD and IBM @server *BladeCenter T Types 8720 and 8730 Installation and User's Guide* on the IBM *BladeCenter T Documentation* CD.

# Configuring the Gigabit Ethernet controllers

Four Ethernet controllers are integrated on the blade server system board. Each controller provides a 1000-Mbps full-duplex interface for connecting to one of the Ethernet-compatible switch modules in I/O-module bays 1 and 2, which enables simultaneous transmission and reception of data on the Ethernet local area network (LAN). Each Ethernet controller on the system board is routed to a different switch module in I/O-module bay 1 or bay 2. The routing from Ethernet controller to I/O-module bay will vary according to blade server type and the operating system

that is installed. See "Blade server Ethernet controller enumeration" for information about how to determine the routing from Ethernet controller to I/O-module bay for your blade server.

**Note:** Other types of blade servers, such as the BladeCenter HS20 Type 8678 blade server, that are installed in the same BladeCenter unit as this BladeCenter HS40 Type 8839 blade server might have different Ethernet controller routing. See the documentation that comes with the other blade servers for detailed information.

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 to enable the blade server operating system to address the Ethernet controllers. For device drivers and information about configuring your Ethernet controllers, see the *Intel Ethernet Software CD* that comes with your blade server. For updated information about configuring the controllers, go to the IBM Support Web site at http://www.ibm.com/pc/support/.

Your Ethernet controllers support failover, which provides automatic redundancy for your Ethernet controllers. Without failover, you can have one Ethernet controller from each server attached to each virtual LAN or subnet. With failover, you can configure more than one Ethernet controller from each server to attach to the same virtual LAN or subnet. Any one of the integrated Ethernet controllers can be configured as the primary Ethernet controller. If you have configured the controllers for failover and the primary link fails, a 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 identical configurations.

# Blade server Ethernet controller enumeration

The enumeration of the Ethernet controllers in a blade server is operating-system dependent. You can verify the Ethernet controller designations a blade server uses through your operating-system settings.

The routing of an Ethernet controller to a particular I/O-module bay depends on the type of blade server. You can verify which Ethernet controller is routed to which I/O-module bay by using the following test:

1. Install only one Ethernet switch module or pass-thru module in I/O-module bay 1.
2. Make sure that the ports on the switch module or pass-thru module are enabled (click **Switch Tasks → Management → Advanced Switch Management** in the management-module Web-based user interface).
3. Enable only one of the Ethernet controllers on the blade server. Note the designation that the blade server operating system has for the controller.
4. Ping an external computer on the network connected to the switch module. If you can ping the external computer, the Ethernet controller that you enabled is associated with the switch module in I/O-module bay 1. The other Ethernet controller in the blade server is associated with the switch module in I/O-module bay 2.

If you have installed an I/O expansion card on a blade server, communications from the option are routed to I/O-module bays 3 and 4. You can verify which controller on the card is routed to which I/O-module bay by performing the same test, using a controller on the I/O expansion card and a compatible switch module or pass-thru module in switch bay 3 or 4.

## Command-line interface and serial over LAN

The IBM @server BladeCenter Management Module Command-Line Interface provides direct access to BladeCenter management functions as an alternative to using the management-module Web interface. Using the command-line interface, you can issue commands to control the power and configuration of the blade server and other components installed in the BladeCenter unit. The command-line interface also provides access to the text-console command prompt for your blade server through a serial over LAN (SOL) connection. See the *IBM @server BladeCenter Management Module Command-Line Interface User's Guide* and the *IBM @server BladeCenter Serial Over LAN Setup Guide* for information and instructions.

# Chapter 3. Diagnostics

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

If you cannot locate and correct the problem using the information in this chapter, see Appendix A, "Getting help and technical assistance," on page 107 for more information.

## Checkout procedure

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

- Read the safety information beginning on page 109.
- The IBM Enhanced Diagnostics programs test the major components of the blade server: the processor board, the input/output (I/O) board, Ethernet controller, video controller, RAM, keyboard, mouse (pointing device), serial ports, and hard disk drives. You can also use them to test some external devices. If you are not sure whether a problem is caused by the hardware or by the software, you can use the diagnostics programs to confirm that the hardware is working correctly. The diagnostics programs are stored in the upgradeable read-only memory (ROM). IBM Director provides a real-time diagnostics program that tests the major components of the blade server while the server operating system is running. The diagnostics can be downloaded from http://www.ibm.com/pc/support/.
- 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.
- **Important:**
  1. If more than one error code is displayed, correct the first error. The other error codes might not occur the next time you run the diagnostic programs.
  2. If the server is suspended and a POST error code is displayed, see "POST error codes" on page 79.
  3. If the server is suspended and no error message is displayed, see "Error symptoms" on page 87 and "Undetermined problems" on page 101.
  4. For information about power-supply problems, see "Power error messages" on page 97.
  5. For intermittent problems, check the error log; see "POST error logs" on page 23 and "Diagnostic programs and error messages" on page 25.

**001** COMPLETE THE FOLLOWING STEPS TO PERFORM THE CHECKOUT PROCEDURE.

1. Turn off the server and all external devices, if any are 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 "POST error codes" on page 79.
7. Check the information LED panel blade error LED; if it is lit, see "Diagnosing problems using the light path diagnostics feature" on page 27.
8. Check the system-error log. If an error was recorded, see Chapter 6, "Symptom-to-FRU index," on page 77.
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 77.

**YES.** Run the diagnostic programs. If necessary, see "Diagnostic programs and error messages" on page 25.

If you receive an error, see Chapter 6, "Symptom-to-FRU index," on page 77.

If the diagnostic programs were completed successfully and you still suspect a problem, see "Undetermined problems" on page 101.

## Diagnostic tools overview

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

- **Beep codes and error messages**

  The beep codes indicate that the power-on self-test (POST) or the baseboard management controller (BMC) have detected a problem during startup. Error messages also appear during startup if POST detects a hardware-configuration problem. See "Beep codes" on page 77 for more information.

- **Diagnostic programs and error messages**

  Real Time Diagnostics tests the major components of the BladeCenter unit, including the managemente modules, switch modules, CD-ROM drive, diskette drive, and the blade server, while the server operating system is running. Real Time Diagnostics can either be plugged into an existing IBM Director environment or installed without IBM Director present. For documentation and download information for the Real Time Diagnostics, go to http://www.ibm.com/servers/xseries/systems_management/xseries_sm.html.

  **Notes:**

  1. As of the date of this document, the IBM Director CD does not come with the BladeCenter T unit. If you have the BladeCenter T unit, see the IBM @server *BladeCenter HS40 Type 8839 Installation and User's Guide* for more information.

2. See "Diagnostic programs and error messages" on page 25 for more information.

- **Error symptom charts**

  These charts list problem symptoms and steps to correct the problems. See "Error symptoms" on page 87 for more information.

- **Light path diagnostics**

  Use the light path diagnostics to diagnose system errors quickly. See "Diagnosing problems using the light path diagnostics feature" on page 27 for more information.

# 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, the first screen of the operating system or application program appears.

If POST detects a problem, one or more beeps sound, and an error message appears on the screen. See "Beep codes" on page 77 and "POST error codes" on page 79 for more information.

**Notes:**

1. If a power-on password is 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.

# Viewing the System Event Log (SEL)

The System Setup Utility (SSU) is used to view the System Event Log (SEL) records. Running the `ssu.bat` file provided on the SSU media invokes the SSU environment by running the Application Framework (AF). If the system starts up directly from the SSU media, this batch file starts automatically. If the system starts up from a different media, the SSU can be started manually. When started in local execution mode (the default mode), the SSU accepts user input from the keyboard and or mouse and presents a graphical user interface (GUI) on the primary monitor.

The SSU can run on writable or non-writable, removable or non-removable media. However, if the SSU media is non-writable, any user preference changes will be lost when you exit the utility. This includes any changes made to color, operating mode, language, and any other options that may be available from the various modules included with the SSU.

The SSU automatically launches the SEL Manager after initializing the main window of the AF.

The SEL Manager Add-In provides services to view the SEL stored on the server management storage device of a server. The SEL Manager provides support to perform the following functions:

- Examine all SEL entries stored in the non-volatile storage area of the server.

- Examine SEL entries from a previously stored file.
- Save the SEL entries to a file.
- Clear the SEL entries from the non-volatile storage area.

## SEL Manager main window

The main window of the SEL Manager provides access to all the features of the add-in through a series of menus. Each menu item supports an accelerator key, which is indicated by an underlined letter in VGA mode or a highlighted letter in text mode.

The SEL Manager main window is based on a multi-column format. All SEL entries are displayed in this window, one system event per row. Each column can be sorted by clicking on the column heading. The event number is tied to the particular event even if another column sorts the list. The F4 key shifts the event columns left, while the F5 key shifts the event columns right.

## Application Framework Help subsystem

In addition to the main window, the application framework (AF) also provides a help subsystem that is used by both the AF and each add-in included with the SSU. The help subsystem includes three windows: the Help Display Window, the Help Contents Window, and the Help Search Window.

The Help Display Window is accessible through the Help button on the AF main window or via the F1 accelerator key (to provide context-sensitive help). The Help Display Window displays information about a help topic.

## Running the SEL Viewer

You can run the SSU SEL Viewer from the *Resource* CD that comes with the blade server. The latest SSU utility image can be downloaded from the IBM Support Web site at http://www.ibm.com/eserver/support/. If you download the latest image of the SSU utility, complete the following steps:

1. Create diskette of the image.
2. Start your blade server with the diskette.
3. The SSU will launch once the setup is complete.

## Diagnostic programs and error messages

The server diagnostic programs are stored in ROM on the processor board. These programs are the primary method of testing the major components of the blade 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 messages that might appear in the detailed test log and summary log when the diagnostic programs are run.

# Diagnostic text messages

While a test is running, the name of the test is displayed on the screen. If the test detects an error or is abnormally ended, a message is displayed to indicate the reason that the test stopped. The message is in the following form:

`Result test_specific_string`

where:

**Result**
is one of the following results:

| | |
|---|---|
| **Passed** | The test was completed without any errors. |
| **Failed** | The test detected an error. |
| **User Aborted** | You stopped the diagnostic test before it was completed. |
| **Not Applicable** | You attempted to test a device that is not present in the server. |
| **Aborted** | The test could not proceed because of the server configuration. |
| **Warning** | A possible problem was reported during the diagnostic test (for example, a device that was to be tested is not installed). |

**test_specific_string**
is an error code or other information about the error.

# 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, 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. Use the selection buttons on the blade server to make necessary adjustments.

2.  When the message `F2 for Diagnostics` appears, press F2.

3.  After the diagnostic programs start, select either **Extended** or **Basic** from the top of the screen.

4.  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 remains 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 83.

**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.

## Diagnosing problems using the light path diagnostics feature

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 unit components also might be lit. These LEDs help identify the cause of the problem.

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

The following illustrations show the location of the LEDs and LED power switch on the processor board and I/O board. You might need to refer to these illustrations when solving problems with the blade server. You need to remove the blade server from the BladeCenter unit, open the cover, and press one of the Light Path Diagnostics buttons to light any error LEDs that were turned on during blade server operation. These LEDs will remain lit for a maximum of 25 seconds.

The following illustration shows the LEDs on the processor board.

Microprocessor 2 error LED (DS5H4)

Microprocessor 1 error LED (DS5H5)

Microprocessor 3 error LED (DS5H1)

Microprocessor 4 error LED (DS5H2)

Microprocessor mismatch
error LED (DS5H3)

Light path diagnostics
button (SW9J1)

Microprocessor socket 1

Microprocessor socket 2

Light path
diagnostics
LED (green)
(DS9J1)

DIMM 8

DIMM 7

DIMM 6

DIMM 5

DIMM 4

DIMM 3

DIMM 2

DIMM 1

DIMM 1 error LED (DS6C1)

DIMM 2 error LED (DS6D1)

DIMM 3 error LED (DS6D2)

DIMM 4 error LED (DS6E1)

DIMM 5 error LED (DS6F1)

DIMM 6 error LED (DS6G1)

DIMM 7 error LED (DS6G2)

DIMM 8 error LED (DS6H1)

Microprocessor socket 3

Microprocessor socket 4

The following illustration shows the LEDs on the I/O board.



Secondary IDE
error LED (DS6H1)

Primary IDE
error LED (DS2H1)

Board error
(DS7A2)

Processor
board
error LED (DS8A2)

Light path
diagnostics
button (S8A1)

Light path
diagnostics LED (green)
(DS8A1)

BMC error LED (DS7B1)

NMI error LED (DS7A3)

Temperature error LED (DS7A4)

I/O board error LED (DS7A1)

For example:

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

1. Remove the blade server from the BladeCenter unit.
2. Place the blade server on a flat, non-conductive surface.
3. Remove the cover from the blade server.
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 lit for as long as you press the button, to a maximum of 25 seconds.

Use the table at "Light path diagnostics" on page 86 to help determine the cause of the error and the action you should take.

## Memory errors

If a memory problem occurs, complete the following steps 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 44.

# Recovering the BIOS code

If the BIOS code has become damaged, such as from a power failure during a flash update, the blade server might appear to be nonfunctional (no video, no beeps). You can recover the BIOS code using the BIOS code page jumper (J1E2) and a BIOS flash diskette.

**Note:** To obtain a BIOS flash diskette, download a BIOS flash diskette image 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 the blade server consists of a primary page and a backup page. The J1E2 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, and remove the blade server from the BladeCenter unit (see "Removing the blade server from the BladeCenter unit" on page 39).
2. Remove the cover (see "Opening the blade server cover" on page 40).
3. Locate the BIOS code page jumper (J1E2) on the I/O board.
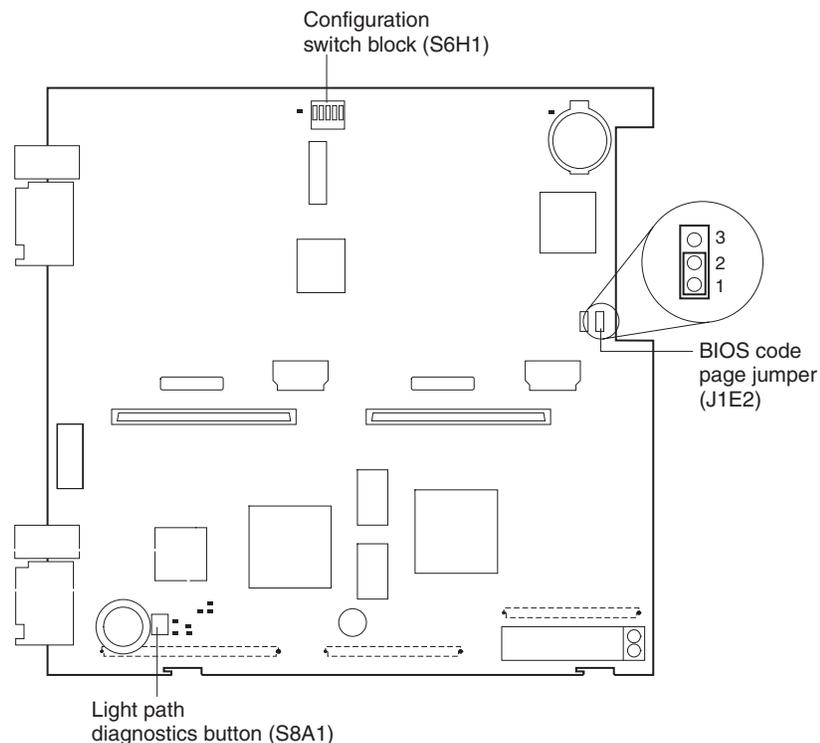


4. Move J1E2 to pins 2 and 3 to enable BIOS recovery mode.
5. Replace the cover, and reinstall the blade server in the BladeCenter unit, making sure the media tray is selected by the relevant blade server.
6. Insert the BIOS flash diskette into the diskette drive.
7. Restart the blade server. The server begins the power-on self-test (POST).
8. Select **1 - Update POST/BIOS** from the menu that contains various flash (update) options.

9. 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.

10. When you are prompted whether you want to save the current code to a diskette, press N.

11. Select your language (0 through 5), and press Enter to accept your choice.

**Attention:** Do *not* restart the blade server at this time.

12. Remove the flash diskette from the diskette drive.

13. Turn off the blade server, remove it from the BladeCenter, and remove the cover of the blade server.

14. Move the J1E2 jumper to pins 1 and 2 to return to normal startup mode.

15. Replace the cover, and reinstall the blade server in the BladeCenter unit; then restart the blade server. The blade server starts.

**Statement 21**



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

# Clearing CMOS memory

Complete the following steps to clear CMOS memory:

1. Review the safety information beginning on page 109.

2. Turn off the blade server, and remove the blade server from the BladeCenter unit.

3. Open the top cover.

4. Find the configuration switch block on the I/O board. For the location of the configuration switch block, see "Switches and jumpers" on page 38.

5. Flip switch 3 from the Off position to the On position.

6. Wait 10 seconds; then, flip the switch to the Off position.

7. Reconnect all external cables and the power cord.

8. Turn on all attached devices, and restart the blade server.

# Chapter 4. Installing options

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 installing options in your blade server, read the following information:

- Read the safety information beginning on page 109 and the guidelines in "Handling static-sensitive devices." 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.
- Before you remove a hot-swap blade server from the BladeCenter unit, you must shut down the operating system and turn off the blade server. You do not have to shut down the BladeCenter unit itself.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the server, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- For a list of supported options for your blade server, go to http://www.ibm.com/pc/us/compat/.

## System reliability considerations

To help ensure proper cooling and system reliability, make sure that each microprocessor socket always contains either a microprocessor heat-sink filler or a microprocessor and heat sink and that the air baffle is correctly installed.

## Handling static-sensitive devices

**Attention:** Static electricity can damage electronic devices and your system. 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:

- When working on the BladeCenter T unit, use an electrostatic discharge (ESD) wrist strap, especially when you will be handling modules, options, and blade servers. To work properly, the wrist strap must have a good contact at both ends (touching your skin at one end and firmly connected to the ESD connector on the front or back of the BladeCenter T unit).
- 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 unit or any *unpainted* metal surface on any other grounded rack component in the rack you are installing the device in for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into 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. Heating reduces indoor humidity and increases static electricity.

## Major components of the BladeCenter HS40 Type 8839 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 unit and remove the blade server cover to see the components.

**Note:** The illustrations in this document might differ slightly from your hardware.
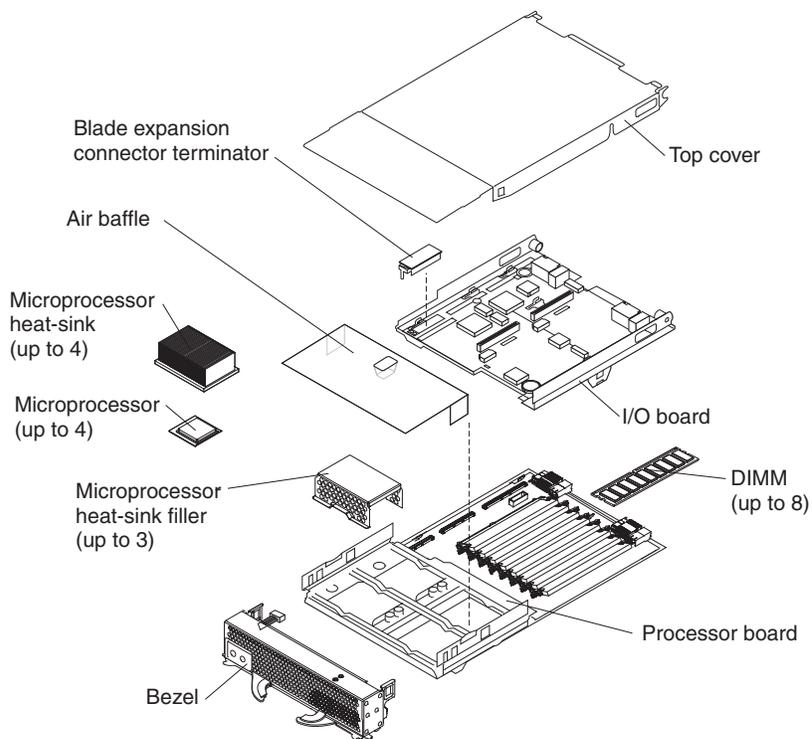
# Processor board components

The following illustration shows the components on the processor board.

DIMM socket 8 (J9H1)
DIMM socket 7 (J9G1)
DIMM socket 6 (J9F1)
DIMM socket 5 (J9E2)
DIMM socket 4 (J9E1)
DIMM socket 3 (J9D1)
DIMM socket 2 (J9C2)
DIMM socket 1 (J9B3)

Microprocessor socket 1
Microprocessor socket 2

DIMM 8
DIMM 7
DIMM 6
DIMM 5
DIMM 4
DIMM 3
DIMM 2
DIMM 1

Control panel connector (J1A1)

Flex-cable connectors (to I/O board)

Microprocessor socket 4
Microprocessor socket 3
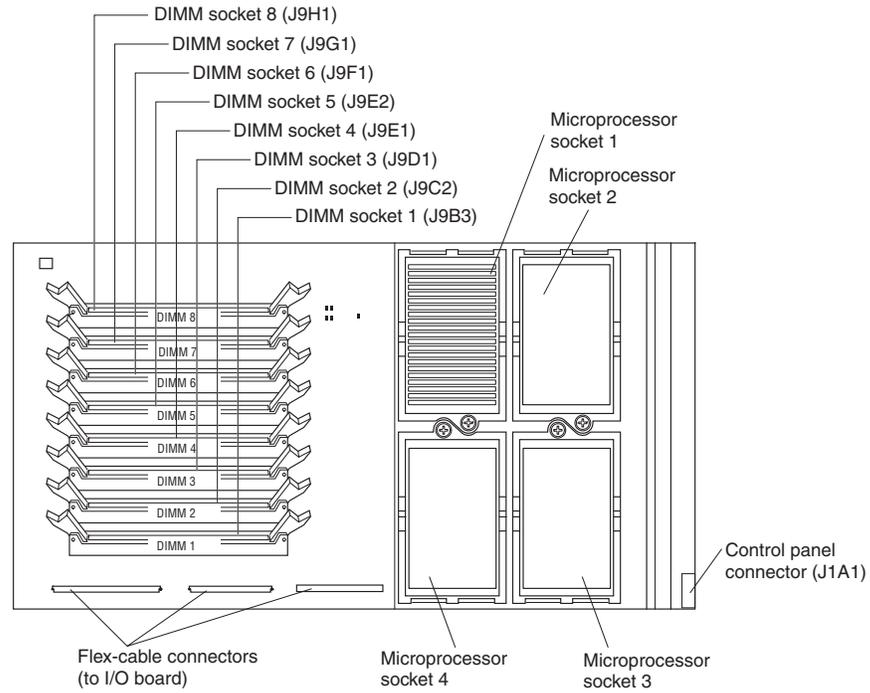
# I/O board components

The following illustration shows the components on the I/O board.

J8H1 connector
J4H1 connector
Battery

I/O expansion option 1 connectors

I/O expansion option 2 connectors

Blade expansion connector (J3A1)

Flex-cable connectors (to processor board)
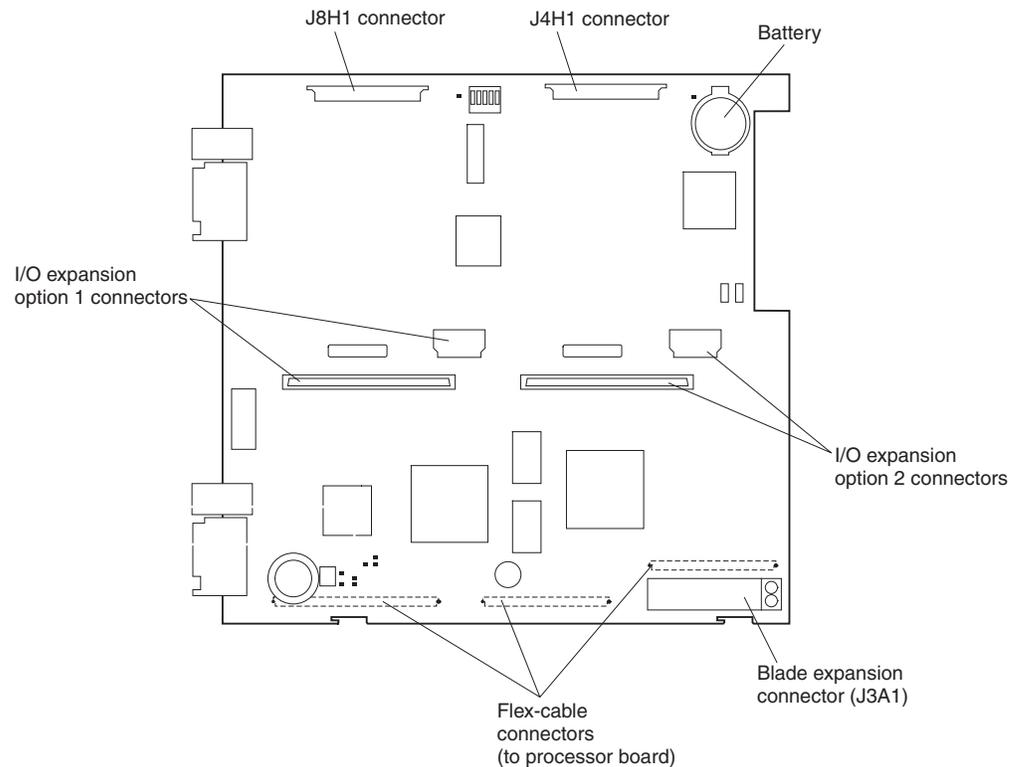
# LED locations

The following illustrations show the LEDs and LED power switch on the processor board and I/O board. You need to remove the blade server from the BladeCenter unit, open the cover, and press one of the Light path diagnostics buttons to light any error LEDs that were lit during blade server operation. These LEDs will remain lit for a maximum of 25 seconds. See "Light path diagnostics" on page 86 for detailed information about this feature.

The following illustration shows the LEDs on the processor board.

Microprocessor 2 error LED (DS5H4)

Microprocessor 3 error LED (DS5H1)

Microprocessor 1 error LED (DS5H5)

Microprocessor 4 error LED (DS5H2)

Microprocessor mismatch error LED (DS5H3)

Light path diagnostics button (SW9J1)

Microprocessor socket 1

Microprocessor socket 2

Light path diagnostics LED (green) (DS9J1)

DIMM 8

DIMM 7

DIMM 6

DIMM 5

DIMM 4

DIMM 3

DIMM 2

DIMM 1

DIMM 1 error LED (DS6C1)

DIMM 2 error LED (DS6D1)

DIMM 3 error LED (DS6D2)

DIMM 4 error LED (DS6E1)

DIMM 5 error LED (DS6F1)

DIMM 6 error LED (DS6G1)

DIMM 7 error LED (DS6G2)

DIMM 8 error LED (DS6H1)

Microprocessor socket 3

Microprocessor socket 4

The following illustration shows the LEDs on the I/O board.



Secondary IDE
error LED (DS6H1)

Primary IDE
error LED (DS2H1)

Board error
(DS7A2)

Processor
board
error LED (DS8A2)

Light path
diagnostics
button (S8A1)

Light path
diagnostics LED (green)
(DS8A1)

BMC error LED (DS7B1)

NMI error LED (DS7A3)

Temperature error LED (DS7A4)

I/O board error LED (DS7A1)

# Switches and jumpers

The following illustration shows the switches and jumpers on the I/O board.



Configuration
switch block (S6H1)

BIOS code
page jumper
(J1E2)

Light path
diagnostics button (S8A1)
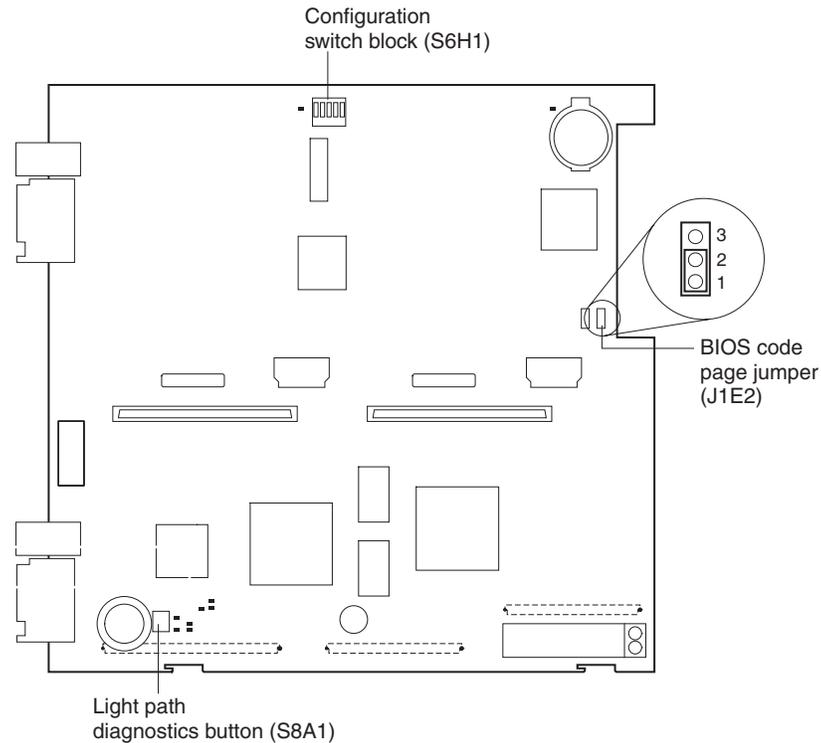
## Switches

Table 1 describes the function of each switch on switch block (S6H1).

*Table 1. Configuration Switch block (S6H1)*

| Switch number | Default value | Switch description |
|---|---|---|
| 1 | Off | Reserved |
| 2 | Off | Password disable |
| 3 through 5 | Off | Reserved |

## Jumpers

When the BIOS code page jumper (J1E2) 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 the blade server *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *BladeCenter Documentation* CD 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. See "Recovering the BIOS code" on page 30 for instructions.

# Removing the blade server from the BladeCenter unit

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



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



Type 8720 or 8730

Bezel assembly
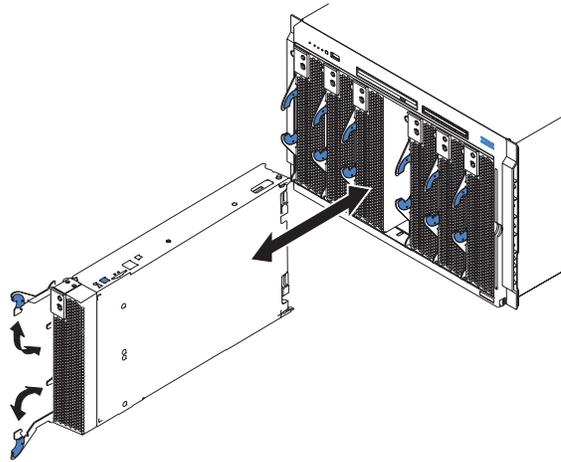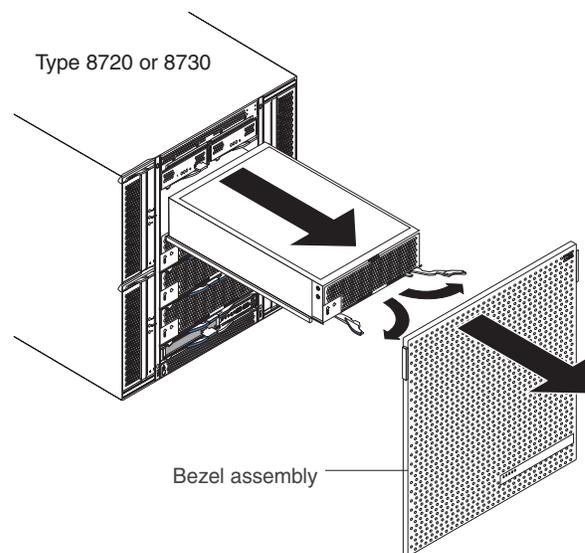
**Attention:**

- To maintain proper system cooling, do not operate the BladeCenter unit without either a blade server, expansion unit, or filler blade installed in each blade bay for more than 1 minute for the BladeCenter unit and 20 minutes for the BladeCenter T unit.
- 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.

Complete the following steps to remove the blade server:

1. If the blade server is operating, shut down the operating system; then, press the power-control button (behind the blade server control panel door) to turn off the blade server. See "Controls and LEDs" on page 8 for more information about the location of the power-control button.

   **Attention:** Wait at least 30 seconds, until the drives stop spinning, before proceeding to the next step.

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).

   **Note:** You must remove the bezel assembly from the BladeCenter T unit before you can access the blade server. Firmly grip the blue touch points (at the top-left and top-right sides of the bezel) and forcefully pull forward, lifting the bezel up and away from the BladeCenter T unit. Carefully set the bezel assembly aside in a safe place.

3. Pull the blade server out of the bay. Spring-loaded doors further back in the bay move into place to cover the bay temporarily.

4. Place either a filler blade or another blade server in the bay within 1 minute for the BladeCenter unit and 20 minutes for the BladeCenter T unit. The recessed spring-loaded doors will move out of the way as you insert the blade server or filler blade.

# Opening the blade server cover

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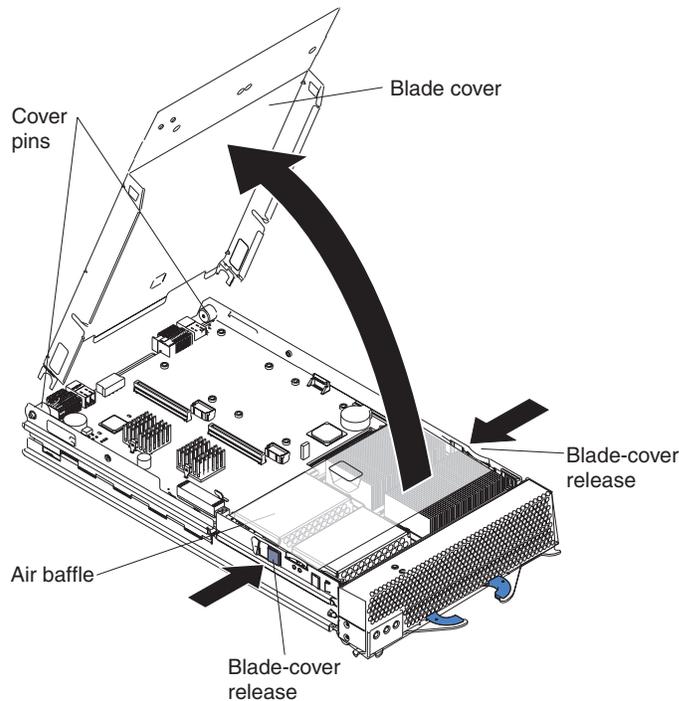


Complete the following steps to open the blade server cover:

1. Review the safety information beginning on page 109 and "Installation guidelines" on page 33.

2. Carefully lay the blade server down on a flat, nonconductive 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 server is connected to the power source. Always replace the blade cover before installing the blade server.**

# Removing the blade server bezel assembly

To install certain options, you must first remove the blade server bezel assembly.

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

1. Review the safety information beginning on page 109 and "Installation guidelines" on page 33.

2. Open the blade server cover (see "Opening the blade server cover" on page 40 for instructions), and lift it off the blade server.

3. Press the bezel-assembly release, and rotate the bezel assembly away from the blade server chassis; then, unhook the tabs on the bottom of the bezel from the holes on the server chassis, and remove the bezel.

Bezel-assembly release

Bezel-assembly release
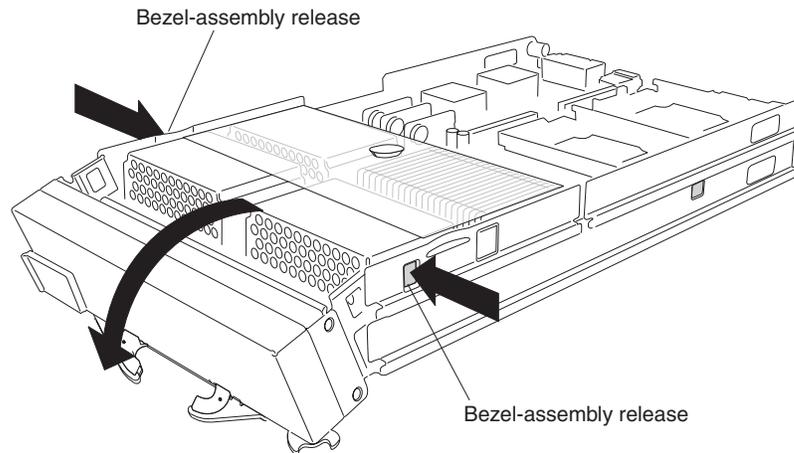
4. Disconnect the control-panel cable from the control-panel connector.

Control-panel connector

Control-panel cable
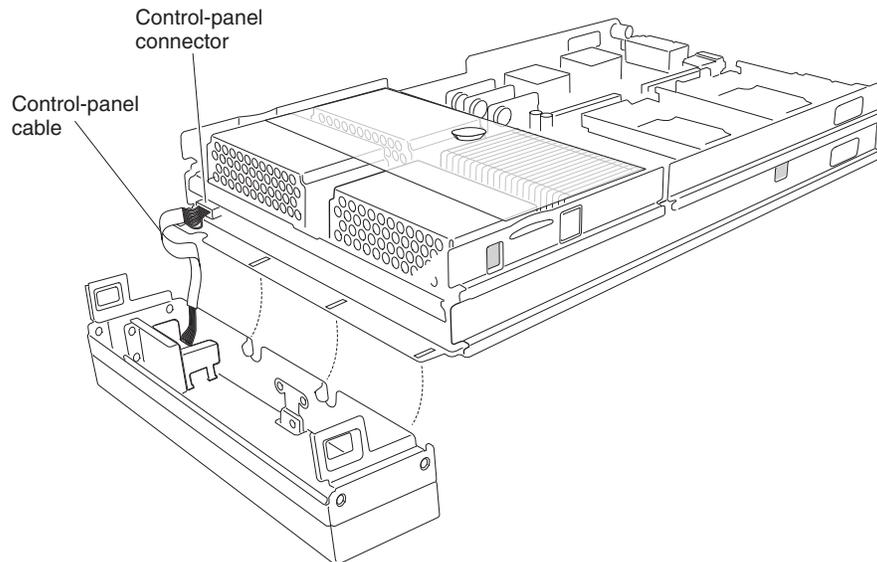
5. Pull the bezel assembly away from the blade server.

6. Store the bezel assembly in a safe place.

# Installing IDE drives

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

**Attention:** To maintain proper system cooling, do not operate the BladeCenter unit without either a blade server, expansion unit, or filler blade installed in each blade bay for more than 1 minute for the BladeCenter unit and 20 minutes for the BladeCenter T unit.

**Important:** Ensure that the storage capacities and speeds of the drives are identical when configuring or replacing drives in a mirrored configuration.
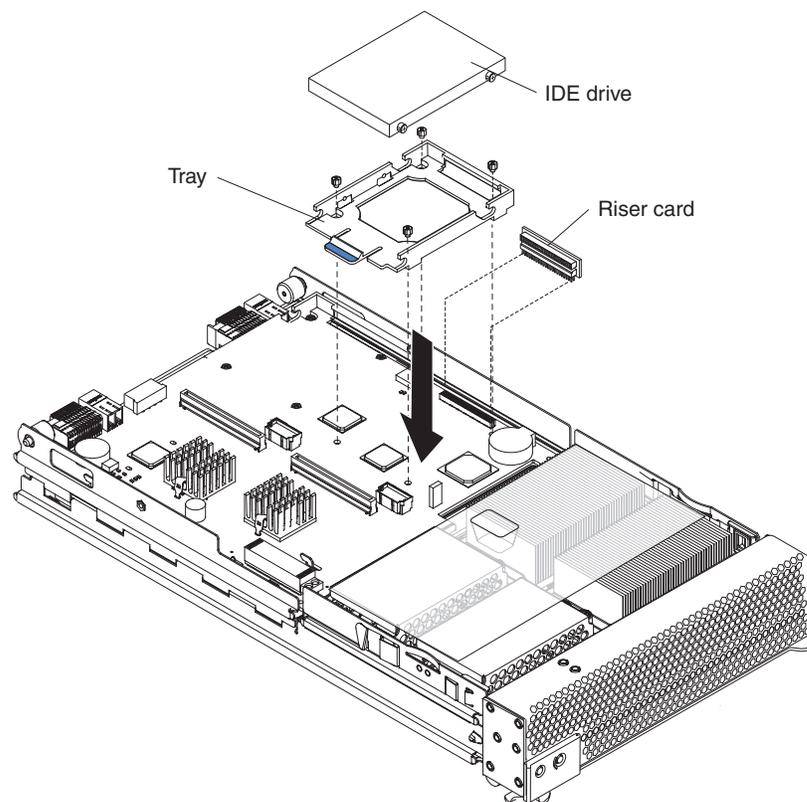


Complete the following steps to install a 2.5-inch IDE drive.

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

1. Read the safety information beginning on page 109 and "Installation guidelines" on page 33.
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 39 for instructions.
3. Carefully lay the blade server on a flat, static-protective surface.
4. Open the blade server cover (see "Opening the blade server cover" on page 40 for instructions).

5. Insert the riser card from the option kit into an IDE connector on the blade server I/O board.

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

6. Place the IDE drive tray from the option kit over the riser card as shown in the illustration, aligning the tray with the screw holes on the I/O 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 I/O board and replace the tray. Secure the tray to the I/O board with screws from the kit.

8. Set any jumpers or switches on the IDE drive.

   **Important:** Both IDE drives must be set to Master.

   **Attention:** Do not press on the top of the IDE drive. Pressing the top could damage the IDE drive.

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

10. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 62.

## Installing memory modules

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

- The processor board contains eight DIMM connectors and supports two-way memory interleaving.

- The DIMM options supported for your blade server are 256 MB, 512 MB, and 1 GB (2 GB when available). Your blade server supports a minimum of 512 MB and a maximum of 8 GB (16 GB with availability of 2 GB DIMMs) of system memory.

- Your blade server comes with two DIMMs installed in the DIMM 4 and DIMM 8 memory connectors (J9E1 and J9H1, respectively). When you install additional DIMMs, be sure to install them as pairs in the connectors and order shown in the following table.

| Pair | DIMM connectors |
|---|---|
| First | 4 and 8 (J9E1, J9H1) |
| Second | 3 and 7 (J9D1, J9G1) |
| Third | 2 and 6 (J9C2, J9F1) |
| Fourth | 1 and 5 (J9B3, J9E2) |

- Both DIMMs in a pair must be the same size, type, and technology. You can mix compatible DIMMs from various manufacturers.

- If you are using the hot-spare memory feature, all DIMMs that are installed in the blade server must be the same size, type, and technology. If you are not using the hot-spare memory feature, the DIMMs of one memory pair do not have to match the DIMMs of the other memory pairs. To use the hot-spare memory feature, at least two DIMM pairs must be installed in the blade server. The hot spare memory feature is enabled using the Configuration/Setup Utility program (see "Configuration/Setup Utility menu choices" on page 12 for information).

- 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/.
- Before you begin, read the documentation that comes with the DIMMs.

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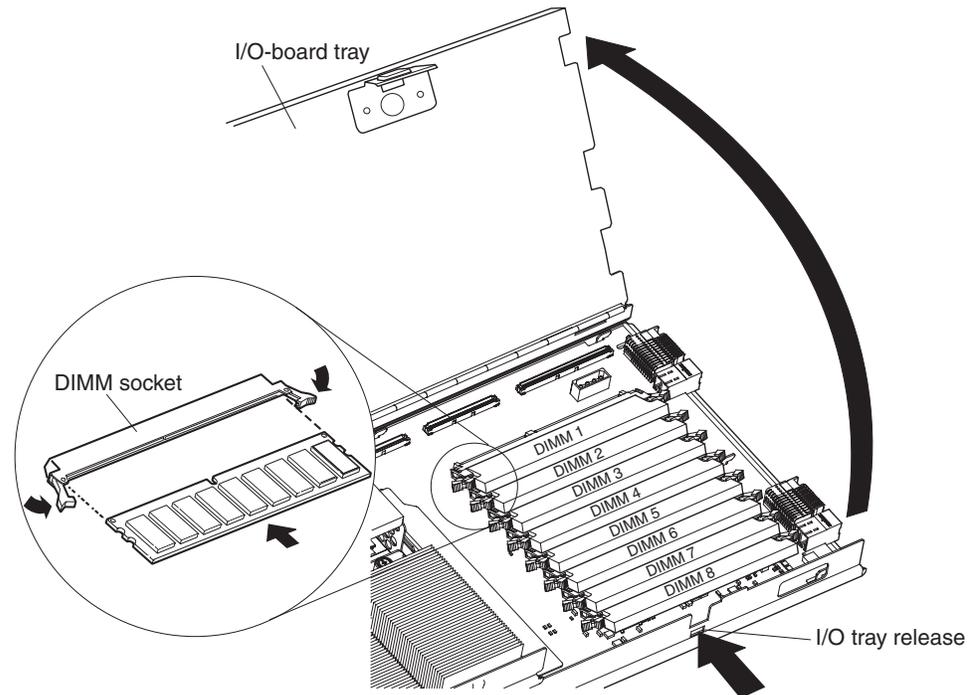


Complete the following steps to install a DIMM:

1. Review the safety information beginning on page 109 and "Installation guidelines" on page 33.
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 39 for instructions.
3. Carefully lay the blade server on a flat, nonconductive surface.
4. Open the blade server cover (see "Opening the blade server cover" on page 40 for instructions) and lift it off the blade server.
5. Press the I/O-tray release and rotate the I/O-tray open, as shown in the illustration. The I/O tray is hinged and will support itself in the open position.
6. Locate the DIMM connectors on the processor board. Determine the connectors into which you will install the DIMMs (see the table on page 44.).
7. 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.
8. 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 processor 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. Make 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 correctly installed. In this case, open the retaining clips and remove the DIMM; then, reinsert the DIMM.

9. Before closing the I/O tray, check that all components are installed and seated correctly and that you have not left loose tools or parts inside the blade server. Pivot the I/O tray to the closed position until it clicks into place.

10. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 62.

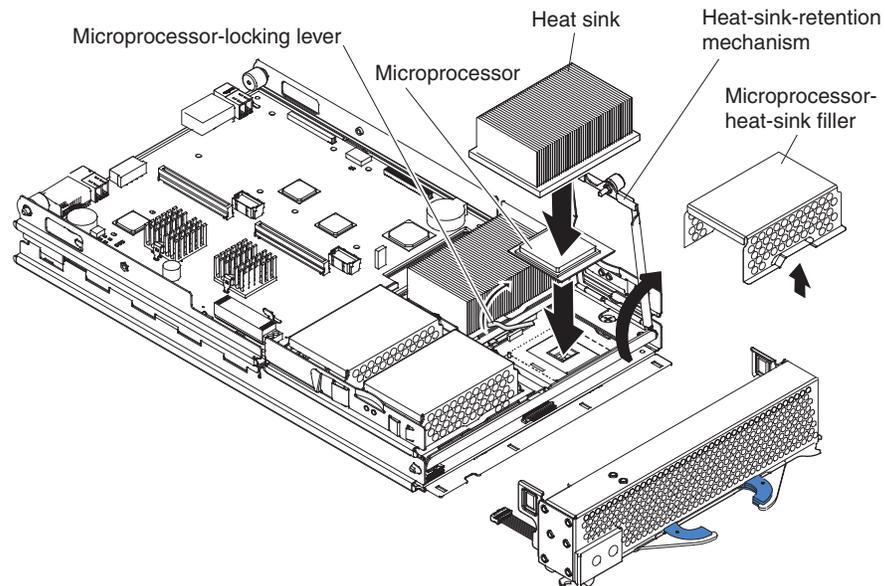## Installing an additional microprocessor

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

- Your blade server supports up to four microprocessors. With two or four microprocessors, your blade server can operate as a symmetric multiprocessing (SMP) server. With one or three microprocessors, the blade server will not operate as an SMP server; however, installing more than one microprocessor will still result in improved server performance, even if the blade server is not configured for SMP operation. With SMP, certain operating systems and application programs can distribute the processing load between the microprocessors. 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/pc/us/compat/.

  **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 of all microprocessors installed in the server must be identical (including system bus speed).

- For a list of microprocessors supported by your blade server, go to the ServerProven® list at http://www.ibm.com/pc/us/compat/.

- 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. See Appendix A, "Getting help and technical assistance," on page 107 for the World Wide Web addresses.

- The microprocessor sockets in this blade server contain built-in termination for the microprocessor bus; therefore, terminator cards are not required for empty microprocessor sockets. However, for proper airflow, an empty microprocessor socket must contain a microprocessor heat-sink filler, sometimes called a microprocessor baffle.

- The microprocessor speeds are automatically set for this blade server; therefore, you do not need to set any microprocessor frequency-selection jumpers or switches.

The following illustration shows how to install the additional microprocessors on the processor board.



Complete the following steps to install an additional microprocessor:

1. Review the safety information beginning on page 109 and "Installation guidelines" on page 33.

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 39 for instructions.

3. Carefully lay the blade server on a flat, nonconductive surface.

4. Open the blade server cover (see "Opening the blade server cover" on page 40 for instructions) and lift it off the blade server.

5. Lift and remove the air baffle covering the microprocessors.

6. Locate the microprocessor socket on the processor board. (See "Processor board components" on page 35 for numbering order of processors.)

   **Note:** Processors must be installed in order, starting with microprocessor 1, then microprocessors 2, 3, and 4.

7. Using a #2 screwdriver, loosen the captive screw on the heat-sink retention mechanism, and rotate the mechanism up.

8. Remove the microprocessor heat-sink filler.

9. Install the microprocessor:

   a. Remove the protective cover, tape, or label from the surface of the microprocessor socket, if one is 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.

      **Attention:** Do not use any tools or sharp objects to lift the locking lever on the microprocessor socket. Failure to do so might result in permanent damage to the processor board.

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 a 135° angle), as shown.

**Attention:** You must make sure 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 processor board.



Lever closed

Lever fully open

or

Lever closed

Lever fully open
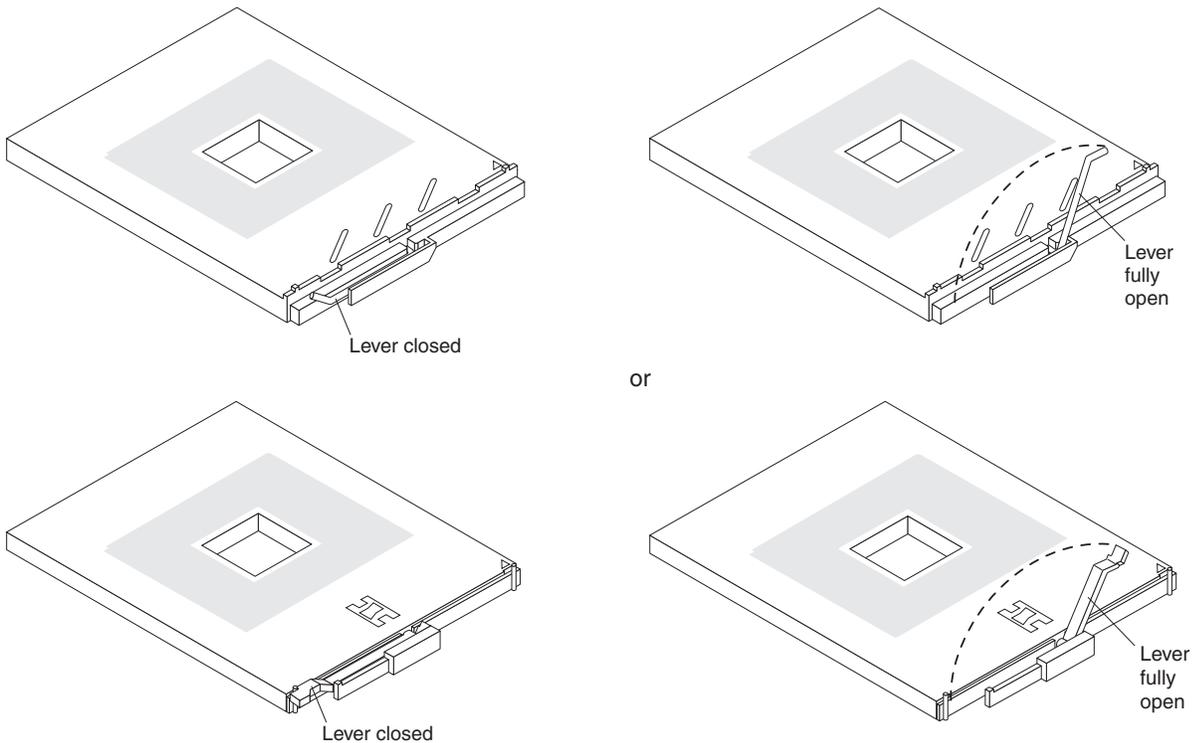
d. Center the microprocessor over the microprocessor socket. Align the triangle on the corner of the microprocessor with the triangle on the corner of the socket, and carefully press the microprocessor into the socket.



Microprocessor

Alignment marks

Microprocessor socket
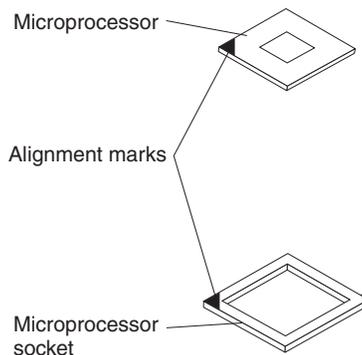
**Attention:**

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

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

10. Install a heat sink on the microprocessor:

    a. Remove the plastic protective cover from the bottom of the heat sink, if one is present.

       **Attention:**

       1) Do not set down the heat sink 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 becomes contaminated, contact your service technician.

    b. Align and place the heat sink on top of the microprocessor. Press firmly on the heat sink.

11. Lower the retention mechanism; then, screw down the captive mounting screw using a #2 Pillips screwdriver. Do not over-tighten the screw. If you are using a torque wrench, tighten the screws to 8,5 to 13 Nm (6.3 to 9.6 foot-pounds).

    **Attention:** To help ensure proper cooling and system reliability the air baffle must be correctly positioned and fully seated.

12. Install the air baffle covering microprocessor 1 and microprocessor 4, making sure that the air baffle is positioned and pushed down so that both heat sink captive mounting screws are through the holes in the air baffle.



Air baffle

Microprocessor 1 and 4
heat sink captive mounting screws
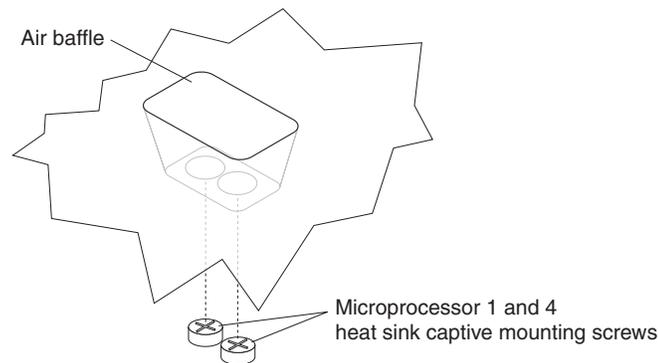
13. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 62.

## Installing an I/O expansion card

You can add one or two optional I/O expansion cards to your blade server to give the blade server up to four additional network connections for communicating on a network. Each I/O expansion card provides two additional network connections that are routed through switch-module bays 3 and 4 of the BladeCenter unit. If two I/O expansion cards are installed, both expansion cards must be of the same type.

**Attention:** When you add an I/O expansion card, you must make sure that the switch modules in switch-module bays 3 and 4 on the BladeCenter unit both support the I/O expansion card network-interface type. For example, if you add an Ethernet expansion card to your blade server, the modules in switch-module bays 3 and 4 on the BladeCenter unit must both be compatible with the Ethernet expansion card. All other I/O expansion cards that are installed on other blade servers in the BladeCenter unit must also be compatible with these switch modules. In this example, you could then install two Ethernet switch modules, two pass-thru modules, or one Ethernet switch module and one pass-thru module. Because pass-thru modules are compatible with a variety of I/O expansion cards, installing two pass-thru modules would allow use of several different types of compatible I/O expansion cards within the same BladeCenter unit.

**Important:**

> If you are installing only one I/O expansion card in the blade server, it must be installed in I/O expansion card location 2.

The following illustration shows how to install an I/O expansion card on the blade server. The same procedure is used to install an expansion card in either I/O expansion card location; however, the illustration shows installing an expansion card only in I/O expansion card location 2.
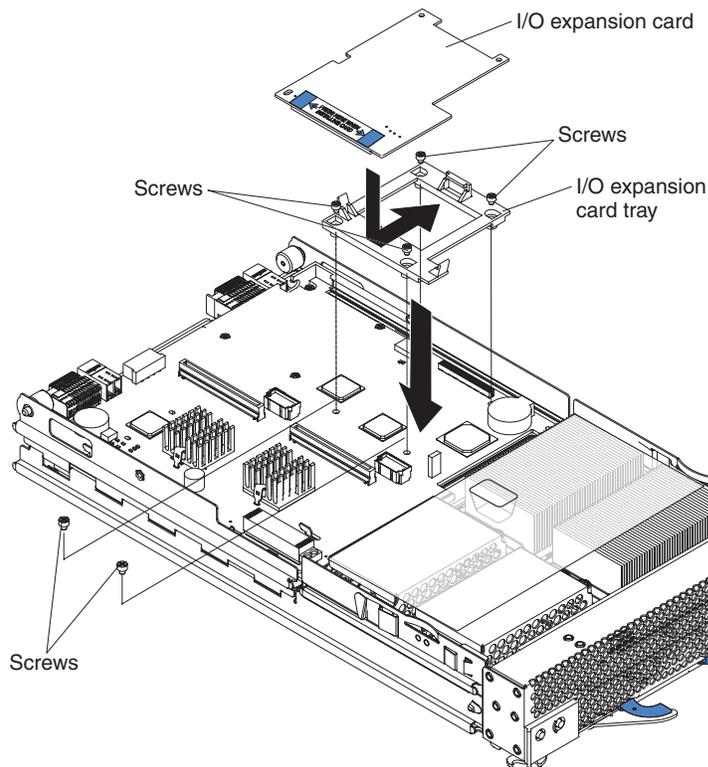


Complete the following steps to install an I/O expansion card:

1. Review the safety information beginning on page 109 and "Installation guidelines" on page 33.
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 39 for information).
3. Carefully lay the blade server on a flat, nonconductive surface.
4. Open the blade server cover (see "Opening the blade server cover" on page 40 for instructions), and lift it off the blade server.
5. Remove the two screws near connector J8H1 (or connector J4H1, if you are installing an I/O expansion card in I/O expansion location 1) that secure the I/O board to the chassis, as shown in the illustration.
6. Install the I/O expansion card:
   a. Install the I/O expansion card tray. Secure the tray to the I/O board with the four long screws from the option kit, as shown in the illustration.
   b. Orient the I/O expansion card as shown in the illustration.
   c. Slide the notch in the narrow end of the card into the raised hook on the tray; then, gently pivot the wide end of the card into the I/O expansion card connectors, as shown in the illustration.

7.  See the documentation that comes with the I/O expansion card for device-driver and configuration information to complete the installation of the I/O expansion card. Some documentation might also be on the IBM *BladeCenter Documentation* CD that comes with the BladeCenter unit.

8.  If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 62.

## Installing a PCI I/O expansion unit

You can install up to two PCI adapters by installing the Peripheral Card Interface (PCI) I/O Expansion Unit on the blade server.

The following illustration shows how to install a PCI I/O Expansion Unit on a blade server.
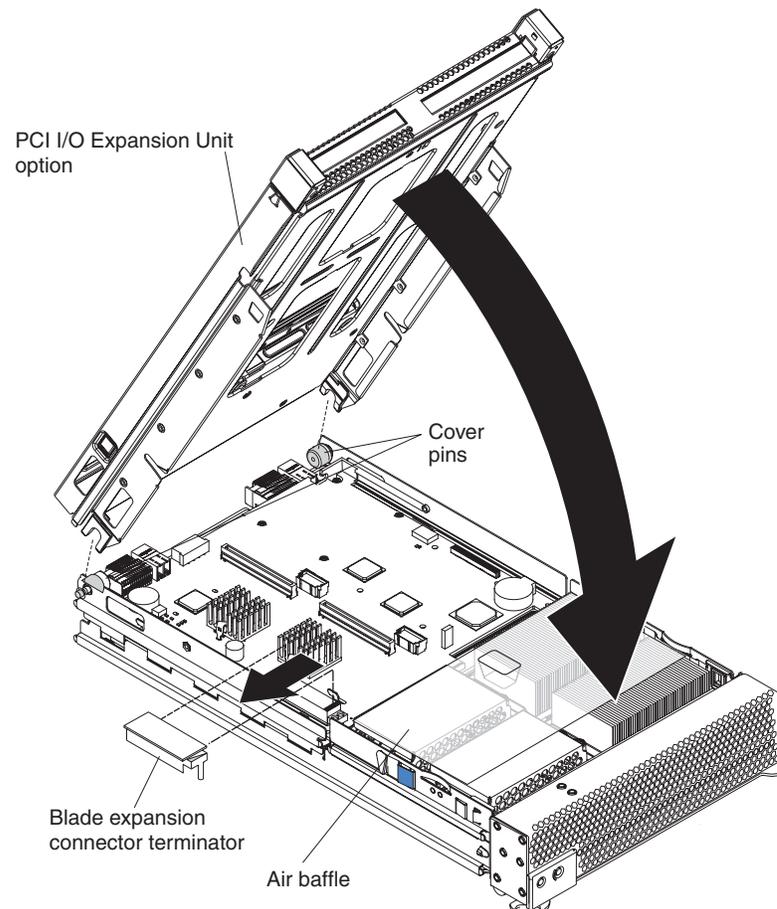


For complete information about installing this expansion unit, see the *Installation Instructions* that comes with the optional expansion unit.

## Installing a SCSI storage expansion unit

**Attention:**   You must install a SCSI storage expansion unit that is specified for use with the IBM HS40 Type 8839 blade server. Two types of SCSI storage expansion units are available for BladeCenter products, only one of which is compatible with the IBM HS40 Type 8839 blade server. See the ServerProven list at http://www.ibm.com/pc/us/compat/ for more information.

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

**Important:** To avoid potential performance and reliability problems when configuring or replacing drives in a mirrored configuration, make sure that the storage capacities and speeds of the drives are identical.

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

**Attention:** To ensure proper cooling and system reliability, make sure that each of the SCSI hard disk drive bays on the SCSI storage expansion unit contains either a hot-swap SCSI hard disk drive or a filler panel.

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

**Note:** The illustrations used in this procedure depict the installation process on a BladeCenter HS40 blade server in a BladeCenter Type 8677 unit. These illustrations might differ slightly from your hardware. However, this installation process is the same regardless of the BladeCenter unit.

1. Review the safety information beginning on page 109 and "Installation guidelines" on page 33.
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 39 for instructions).
3. Carefully lay the blade server on a flat, nonconductive surface.

4. Remove the blade server cover.

a. Open the blade server cover (see "Opening the blade server cover" on page 40 for instructions), and lift it off the blade server.
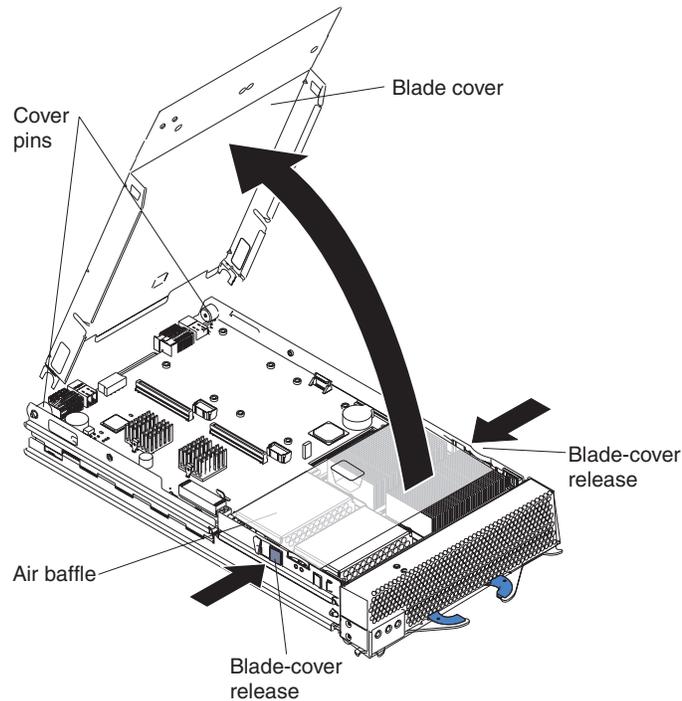


b. Store the cover in a safe place.

5. Locate the blade expansion connector on the processor board and remove the terminator from the connector.
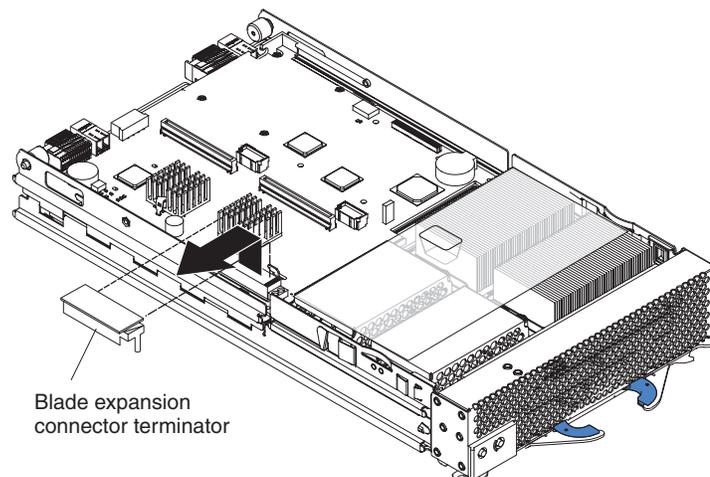


6. Before installing the SCSI storage expansion unit, check that all components are installed and seated correctly and that you have not left loose tools or parts inside the blade server.

**Attention:** To help ensure proper cooling and system reliability, the air baffle must be correctly positioned and fully seated.

7. Make sure that the air baffle covering microprocessor 1 and microprocessor 4 is positioned and pushed down so that both heat sink captive mounting screws are through the holes in the air baffle.

Air baffle

Microprocessor 1 and 4
heat sink captive mounting screws
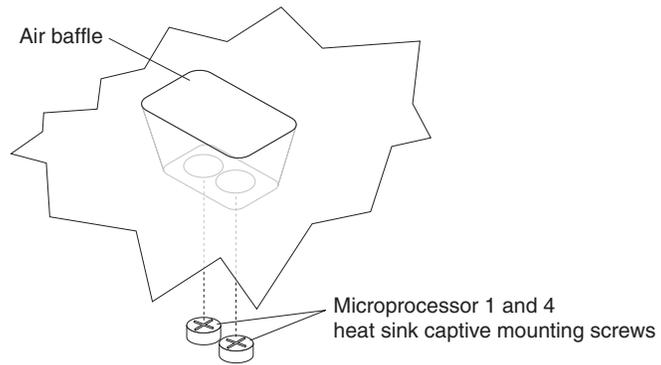
8. Install the SCSI storage expansion unit:

**Attention:** Install only a SCSI storage expansion unit that is specified for use with the IBM HS40 Type 8839 blade server. Compatible SCSI storage expansion units do not have a shield, as shown in the following illustration.

Use SCSI storage expansion unit with no shield

Do not use SCSI storage expansion with shield

No shield

Shield
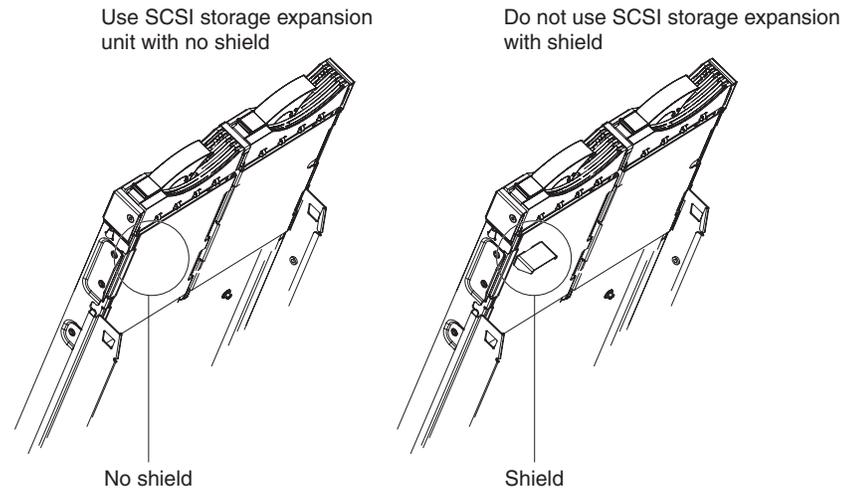
a.  Orient the storage expansion unit as shown in the illustration.

SCSI storage expansion unit

Cover pins

Blade-cover release

Air baffle

Blade-cover release
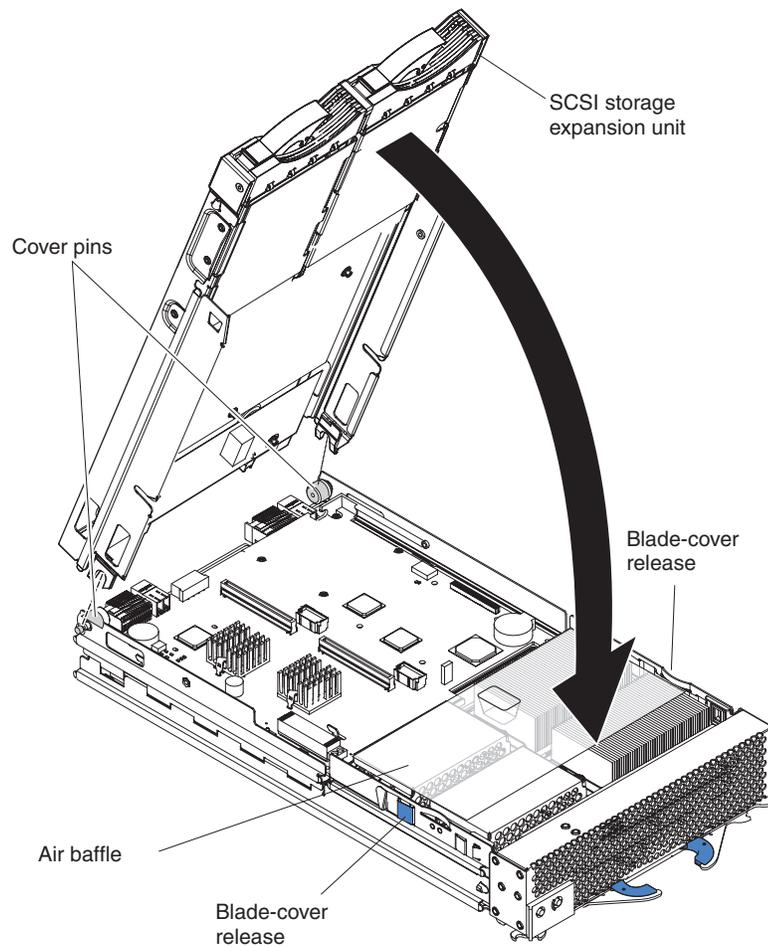
b.  Lower the storage expansion unit so that the slots at the rear slide down onto the pins at the rear of the blade server.

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 connects to the blade expansion connector (J3A1) on the processor board.
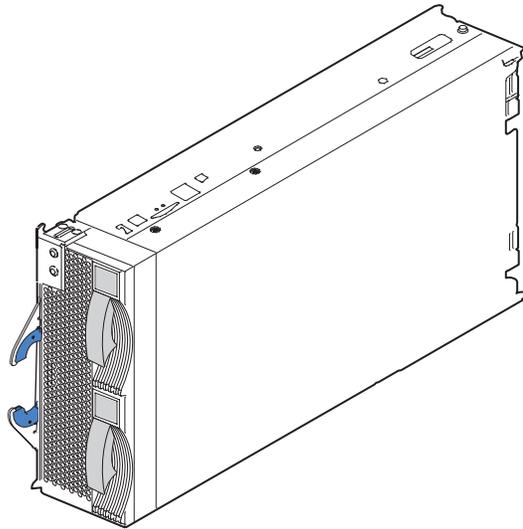


9. Insert the combined blade and expansion unit into three adjacent BladeCenter unit bays.
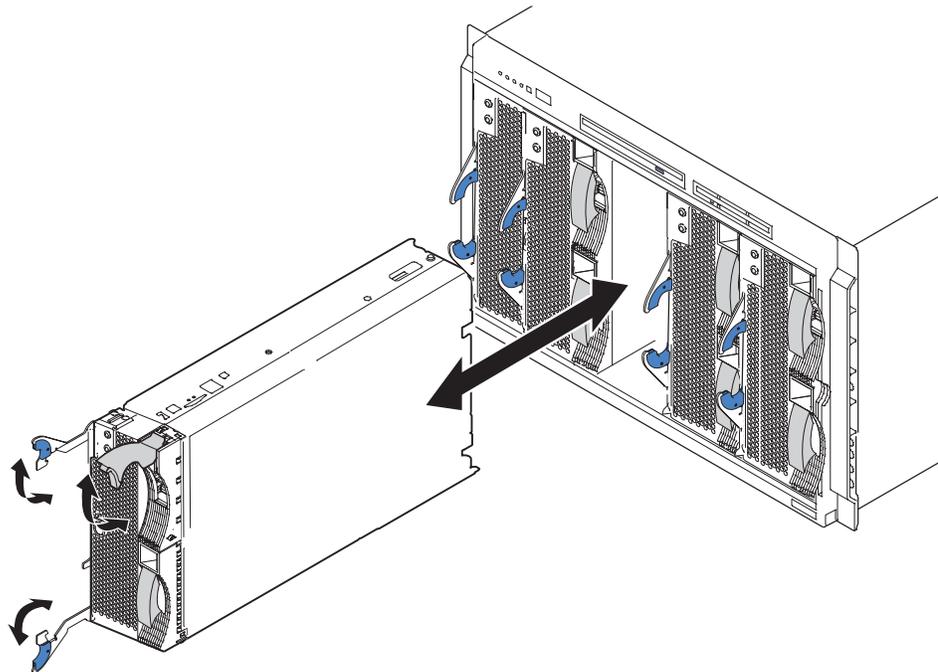


**Note:** When any blade server or option is in blade bay 7 through 14 (in the BladeCenter unit) or blade bay 5 through 8 (in the BladeCenter T unit), power modules must be present in all four power bays.

10. Turn on the blade server.

11. If you have not already done so, install the LSI SCSI device drivers for your operating system. LSI device drivers are on the *ServerGuide Setup and*

*Installation* CD that comes with the BladeCenter unit. 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 expansion unit and configure them for embedded mirroring (RAID level 1). 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 hot-swap hard disk drives in the expansion unit*

| Device | SCSI ID |
|---|---|
| Drive bay 1 | 0 |
| Drive bay 2 | 1 |

**Note:** SCSI ID 7 is usually reserved for the SCSI controller; however, this SCSI ID is changeable through the ServeRAID™ configuration program or the LSI configuration utility program.

Use the Configuration/Setup Utility program in the blade server to enable or disable the SCSI controller in the storage expansion unit. See 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 in the expansion unit.

If a hot-swap hard disk drive in the 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 must be replaced.

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.

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

**Note:** The illustrations used in this procedure depict the installation process on a BladeCenter HS40 blade server in a BladeCenter Type 8677 unit. These illustrations might differ slightly from your hardware. However, this installation process is the same regardless of the BladeCenter unit.
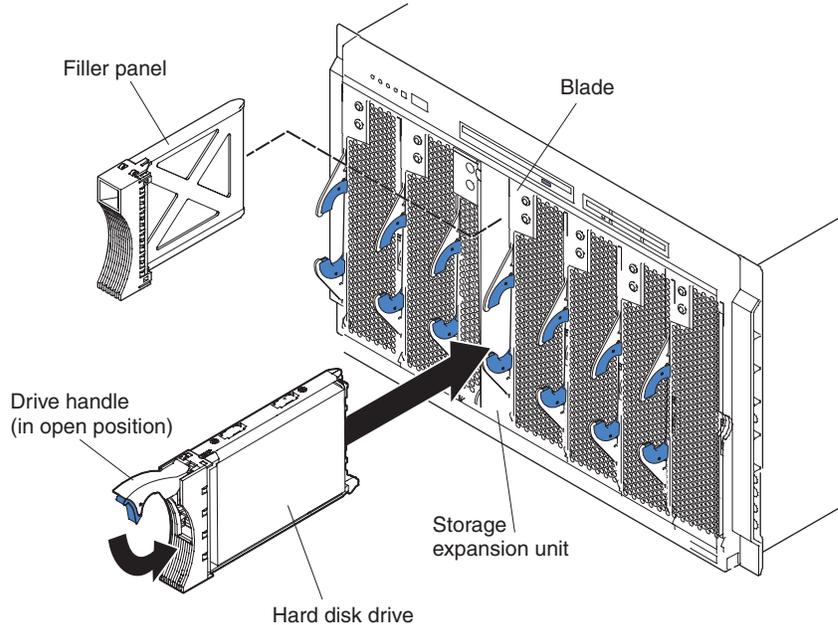


Complete the following steps to install a drive in a storage expansion unit.

**Attention:** To maintain proper system cooling, do not operate the BladeCenter unit for more than 1 minute without either a hot-swap hard disk drive or a filler panel installed in each storage expansion unit bay.

1. Review the safety information beginning on page Appendix B, "Safety information," on page 109 and "Installation guidelines" on page 33.
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 expansion unit.
3. Install the SCSI hot-swap hard disk drive:
   a. Make sure that the tray handle is open (that is, perpendicular to the hard disk drive).
   b. Align the hard disk drive assembly with the guide rails in the bay.
   c. Gently push the hard disk 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 LEDs to make sure that the hard disk drive is operating correctly.
      - If the amber hard disk drive status LED for a hard disk drive is lit continuously, the hard disk drive is faulty and needs to be replaced.
      - If the green hard disk drive activity LED is flashing, the hard disk drive is being accessed.

See the documentation that comes with the expansion unit for information about configuring the expansion unit and SCSI hard disk drives.

# 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 SCSI hot-swap hard disk drive in a storage expansion unit hot-swap bay.

**Note:** The illustrations used in this procedure depict the installation process on a BladeCenter HS40 blade server in a BladeCenter Type 8677 unit. These illustrations might differ slightly from your hardware. However, this installation process is the same regardless of the BladeCenter unit.
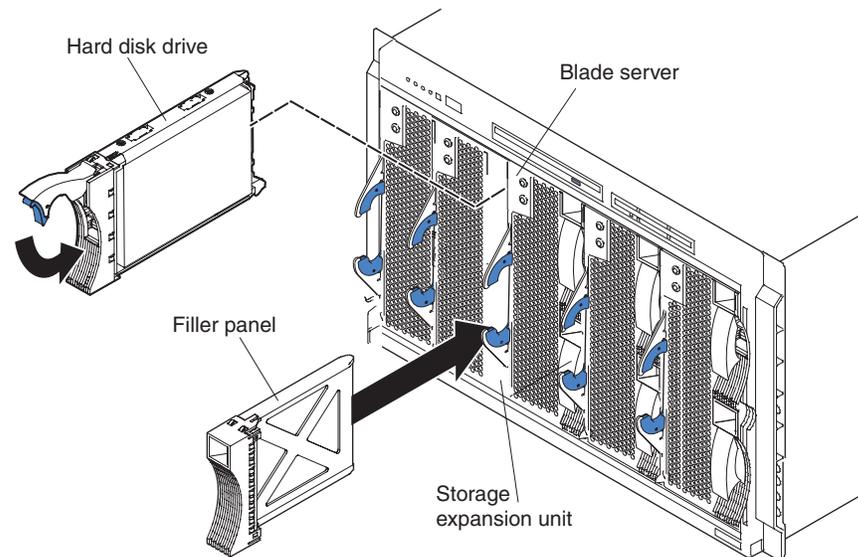


**Attention:** To maintain proper system cooling, do not operate the BladeCenter unit for more than 1 minute without either a hot-swap hard disk drive or a filler panel installed in each storage expansion unit bay.

1. Review the safety information beginning on page 109 and "Installation guidelines" on page 33.
2. Locate the defective hard disk drive (look for an amber status LED on the front of the hard disk drive).
3. Make sure that the hard disk drive has stopped spinning.
4. Move the handle on the hard disk drive to the open position (perpendicular to the hard disk drive), and pull the hot-swap hard disk 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 57 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 1-800-426-7378 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.

**Note:** After you replace the battery, you must reconfigure your 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 safety information beginning on page 109 and "Installation guidelines" on page 33.
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 39 for instructions).
4. Open the blade server cover (see "Opening the blade server cover" on page 40 for instructions) and lift it off the blade server.

5. Locate the battery on the I/O board.
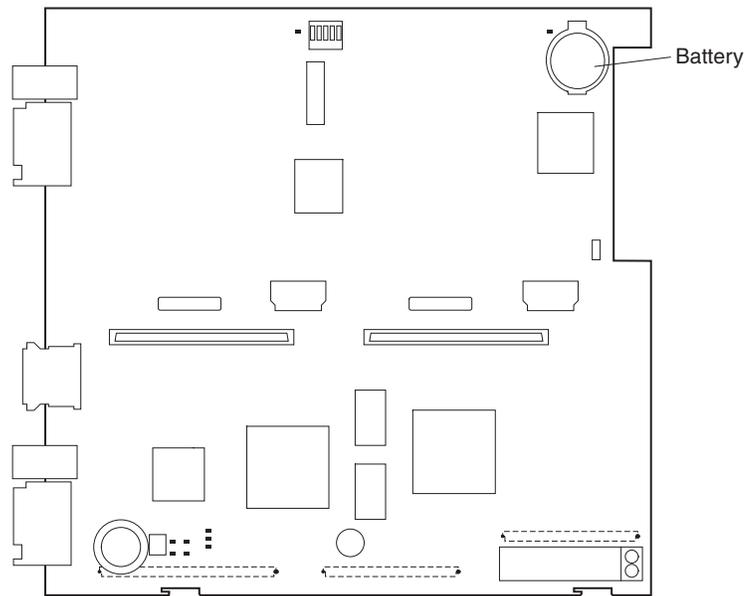


Battery

6. Remove the battery:

   a. Use your fingers to pinch the battery retainer; then, rotate the battery up and out from its socket.

   b. Use your fingernail to slide the battery out from under the battery clip.
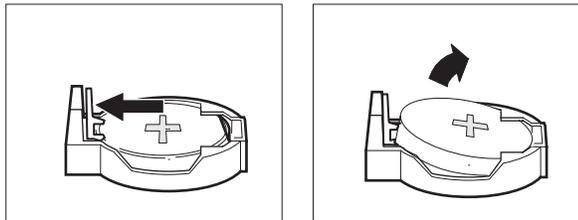


7. Insert the new battery:

   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 until the battery retainer secures it in place.
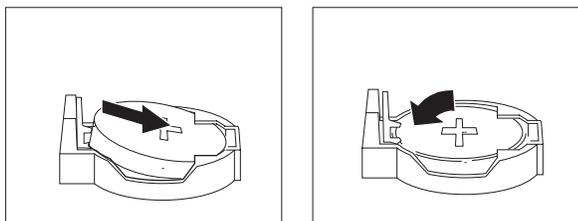


8. Close the blade server cover (see "Closing the blade server cover" on page 63).

   **Statement 21:**

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

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 11 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 (see "Installing the blade server bezel assembly").

   **Attention:** To help ensure proper cooling and system reliability, the air baffle must be correctly positioned and fully seated.

2. Close the blade server cover, unless you installed the SCSI storage expansion unit option (see "Closing the blade server cover" on page 63).

   **Statement 21:**

   

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

3. Reinstall the blade server into the BladeCenter unit (see "Installing the blade server in the BladeCenter unit" on page 65).

4. Turn on the blade server (see "Turning on the blade server" on page 6).

**Note:** Reinstall the bezel assembly on the BladeCenter T unit after you have finished turning on the blades. However, if you installed an option such as a PCI I/O Expansion Unit with PCI adapters that require cables, you will not be able to install the bezel assembly, which contains an air filter for the BladeCenter T unit. If you cannot install the bezel assembly, a filter must be provided on the rack. See the IBM @server *BladeCenter T Planning and Installation Guide* for information about installing an air filter on the rack (you can obtain the planning guide from http://www.ibm.com/pc/support/).

5. For certain options, run the blade server Configuration/Setup Utility program (see "Updating your blade server configuration" on page 67).

**Note:** If you have just connected the power cords of your BladeCenter unit to electrical outlets, 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

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

1. Review the safety information beginning on page 109 and "Installation guidelines" on page 33.
2. Connect the control-panel cable to the control-panel connector on the processor board.

Control-panel
connector

Control-panel
cable
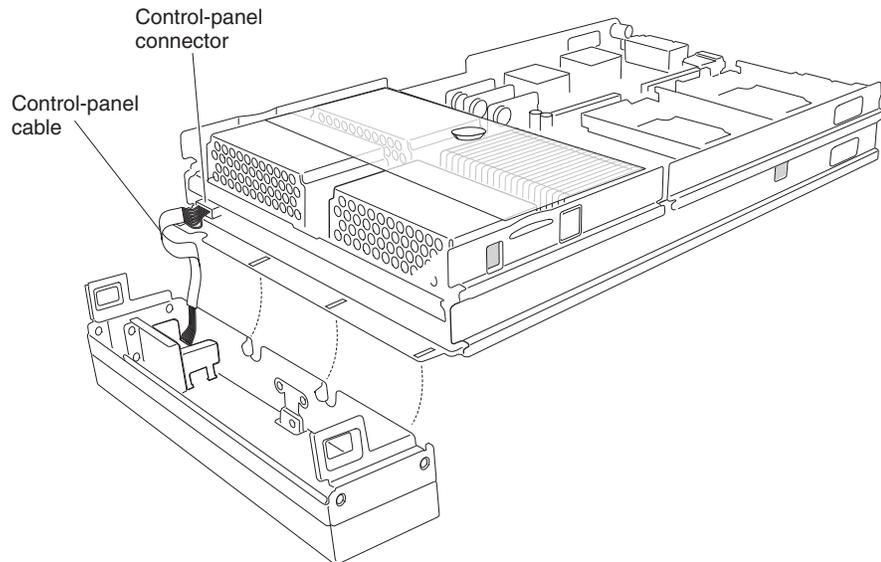
3. Insert the tabs on the bottom of the bezel up into the matching holes on the server chassis; then, rotate the top of the bezel toward the server until the tabs at the top of the bezel snap into place.
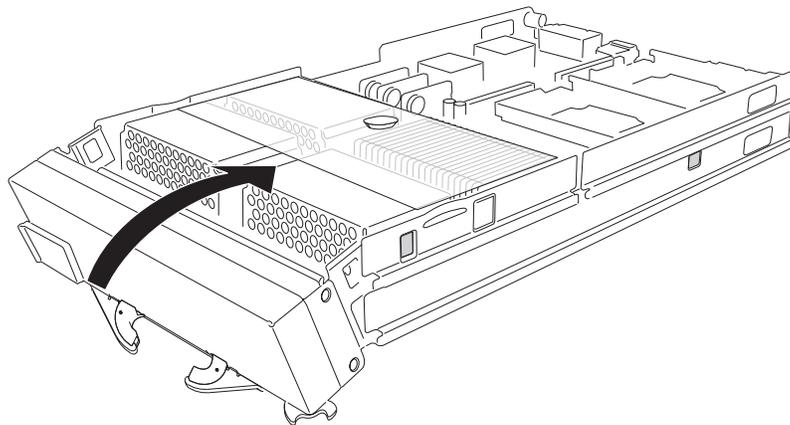
## Closing the blade server cover

**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.
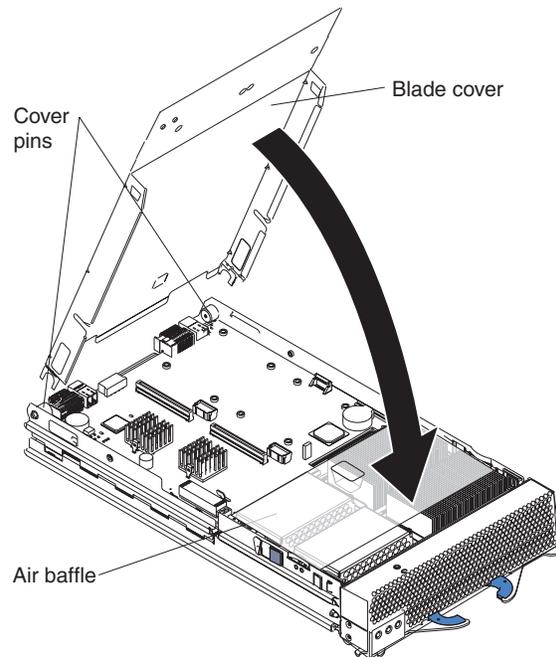


Complete the following steps to close the blade server cover:

1. Review the safety information beginning on page 109 and "Installation guidelines" on page 33.
2. If you removed the blade bezel assembly, replace it now. See "Installing the blade server bezel assembly" on page 62 for instructions.
3. 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.

   **Attention:** To help ensure proper cooling and system reliability the air baffle must be correctly positioned and fully seated.
4. Make sure that the air baffle covering microprocessor 1 and microprocessor 4 is positioned and pushed down so that both heat sink captive mounting screws are through the holes in the air baffle.
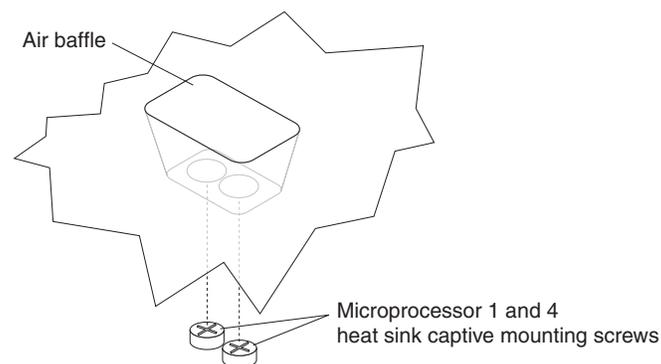


5. Lower the cover so that the slots at the rear slide down onto the pins at the rear of the blade server, as shown in the illustration.
6. Pivot the cover to the closed position as shown in the illustration, until it clicks into place.

# Installing the blade server in the BladeCenter unit

**Note:** The illustrations used in this procedure depict the installation process on a BladeCenter HS40 blade server in a BladeCenter Type 8677 unit. These illustrations might differ slightly from your hardware. However, this installation process is the same regardless of the BladeCenter unit.



Blade server

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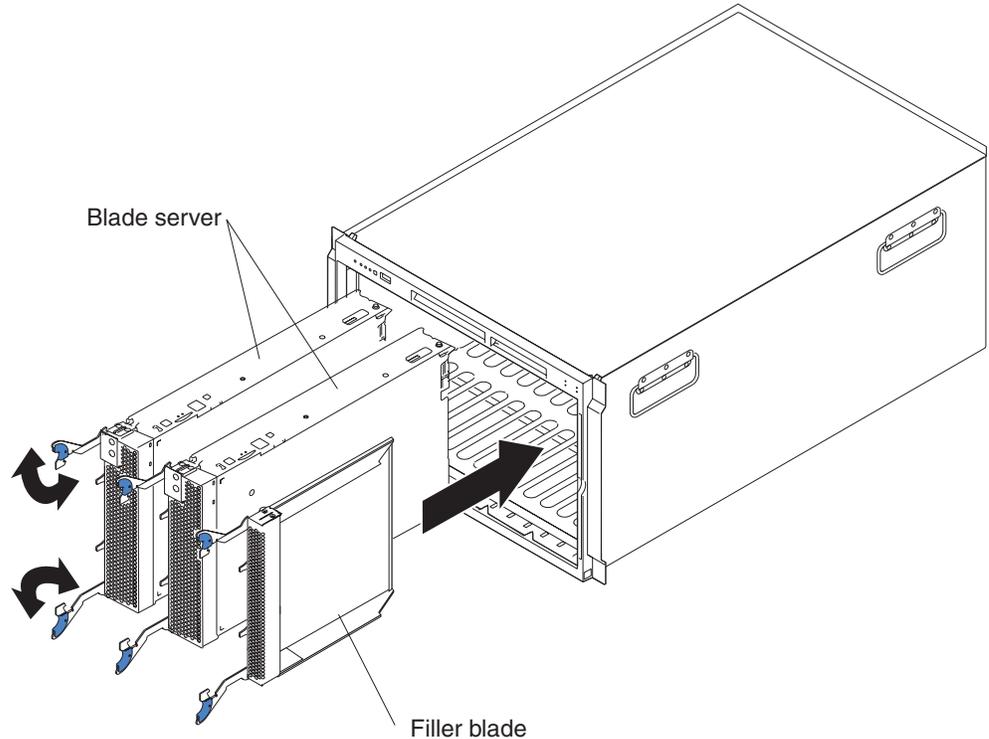
Complete the following steps to install a blade server in the BladeCenter unit.

**Statement 21:**



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

**Attention:**    If you reinstall a blade that you removed, you must install it in the same bays from which you removed it. Some blade server configuration information and update options are established according to bay number. Reinstalling a blade server into different bays than those from which it was removed could have unintended consequences, and you might need to reconfigure the blade server.

1. Review the safety information beginning on page 109 and "Installation guidelines" on page 33 through "Handling static-sensitive devices" on page 33.
2. If you have not done so already, install any required options, such as microprocessors or memory, in the blade server.
3. Select the bays for the blade server.

   **Notes:**

   a. The HS40 blade server requires two adjacent bays.

b. If the blade server has a SCSI storage expansion unit installed on it, the blade server and expansion option require three adjacent bays.

c. When any blade server or option is in blade bays 7 through 14, power modules must be installed in power bays 1 and 2, *and* power modules must be installed in power bays 3 and 4.

**Attention:** To help ensure proper cooling, performance, and system reliability, make sure that each of the blade bays on the front of the BladeCenter unit has a blade server, expansion unit, or filler blade installed. Do not operate the BladeCenter unit for more than 1 minute or the BladeCenter T unit for more than 20 minutes without either a blade server, expansion unit, or filler blade installed in each blade bay.

4. Make sure that the release levers on the blade server are in the open position (perpendicular to the blade).

5. Slide the blade server into the bay until it stops. The spring-loaded doors further back in the bay 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 6 for instructions.

8. Make sure that the power-on LED on the blade control panel is lit continuously, indicating that the blade server is receiving power and is turned on.

9. Write identifying information on one of the user labels that comes with the blade server; then, place the label on the BladeCenter unit bezel just below the blade server, as shown in the following illustration.



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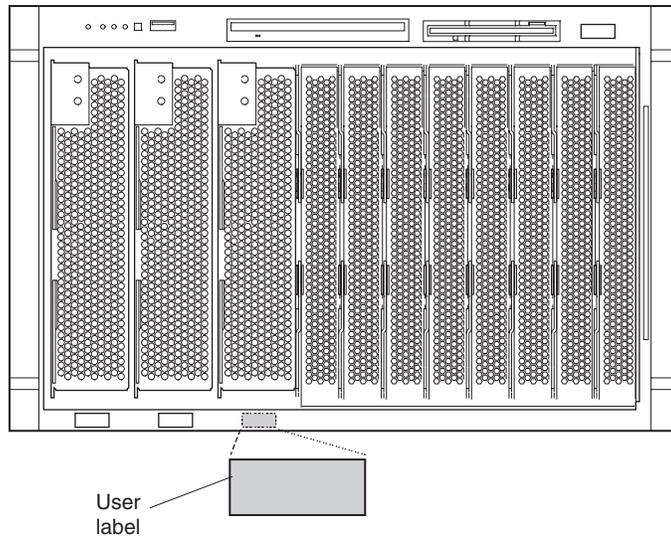
**Important:** Do not place the label on the blade server or block the ventilation holes on the blade server in any way.

The following illustration shows the placement of the label, just to the side of the blade server, on the BladeCenter T unit.



User label
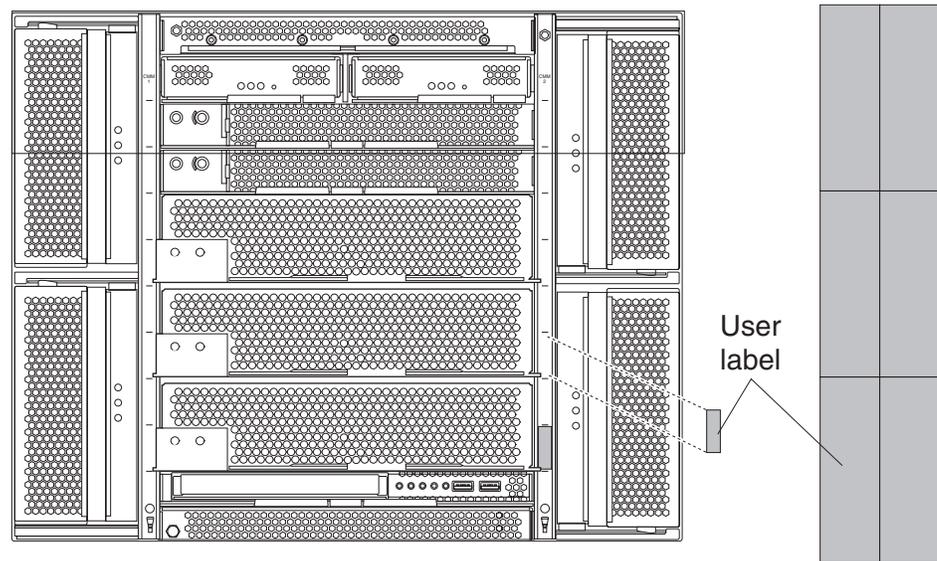
10. If you have other blades to install, do so now.

**Note:** Reinstall the bezel assembly on the BladeCenter T unit after you have finished turning on the blades. However, if you installed an option such as a PCI I/O Expansion Unit with PCI adapters that require cables, you will not be able to install the bezel assembly, which contains an air filter for the BladeCenter T unit. If you cannot install the bezel assembly, a filter must be provided on the rack. See the IBM @server *BladeCenter T Planning and Installation Guide* for information about installing an air filter on the rack (you can obtain the planning guide from http://www.ibm.com/pc/support/).

If this is the initial installation for a blade server in the BladeCenter unit, you must configure the blade server with the blade server Configuration/Setup Utility and install the blade server operating system. See "Updating your blade server configuration" and the IBM @server *BladeCenter HS40 Type 8839 Installation and User's Guide* for details.

## Updating your blade server configuration

When you start your blade server for the first time after you add or remove an internal option or external SCSI device (if the storage expansion unit has been installed), you might receive a message that the configuration has changed. The blade server Configuration/Setup Utility program starts automatically so that you can save the new configuration settings. For more information, see "Using the Configuration/Setup Utility program" on page 11.

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

If your blade server comes with more than one microprocessor or if your blade server comes with one microprocessor and you have installed additional microprocessors, your blade server might be able to operate as an SMP server. You

might need to upgrade the operating system to support SMP. For more information, see IBM @server *BladeCenter HS40 Type 8839 Installation and User's Guide* and your operating-system documentation.

## Input/output connectors and devices

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

The blade server has two selection buttons on the control panel: the CD/diskette/USB select button and the keyboard/mouse/video select button. See "Controls and LEDs" on page 8 for information about these buttons and their functions.

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

# Chapter 5. Service replaceable units

This chapter describes the removal of server components.

**Important:** The field replaceable unit (FRU) procedures are intended for trained servicers who are familiar with IBM products. See the parts listing in Chapter 7, "Parts listing, Type 8839," on page 105 to determine whether a component being replaced is a customer replaceable unit (CRU) or a FRU.

## Microprocessor removal

**Note:**

- Read "Installation guidelines" on page 33.
- Read the safety notices beginning on page 109.
- Read "Handling electrostatic discharge-sensitive devices" on page 112.

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 39).
2. Carefully lay the blade server on a flat, nonconductive surface.
3. Open the blade server cover (see "Opening the blade server cover" on page 40 for instructions).
4. Remove the bezel assembly (see "Removing the blade server bezel assembly" on page 42 for instructions).
5. Identify the microprocessor to be removed.

   **Note:** If you are replacing a failed microprocessor, make sure that you have selected the correct microprocessor for replacement (see "Light path diagnostics" on page 86).
6. Remove the air baffle.

7. Remove the heat sink:
   a. Loosen the captive screw, and lift the retention bar.
   b. Gently pull the heat sink off the microprocessor.
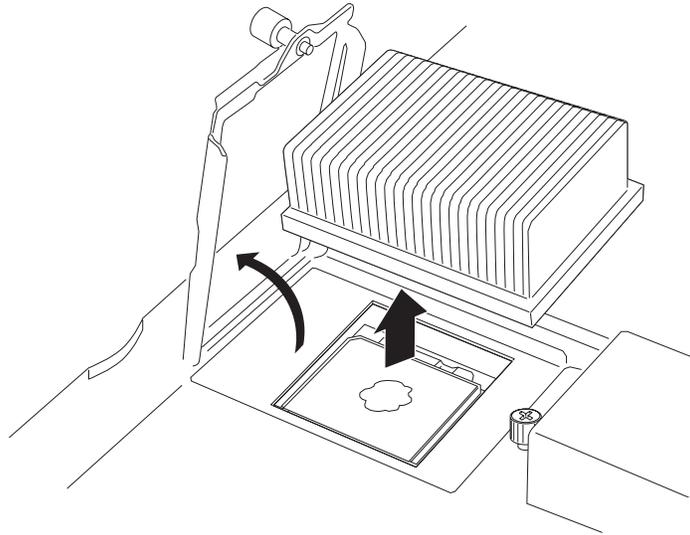


8. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops or clicks in the fully open position (approximately 135° angle), as shown.

   **Attention:** You must make sure that the locking lever on the microprocessor socket is in the fully open position before you remove the microprocessor from the socket. Failure to do so might result in permanent damage to the microprocessor, microprocessor socket, and system board.
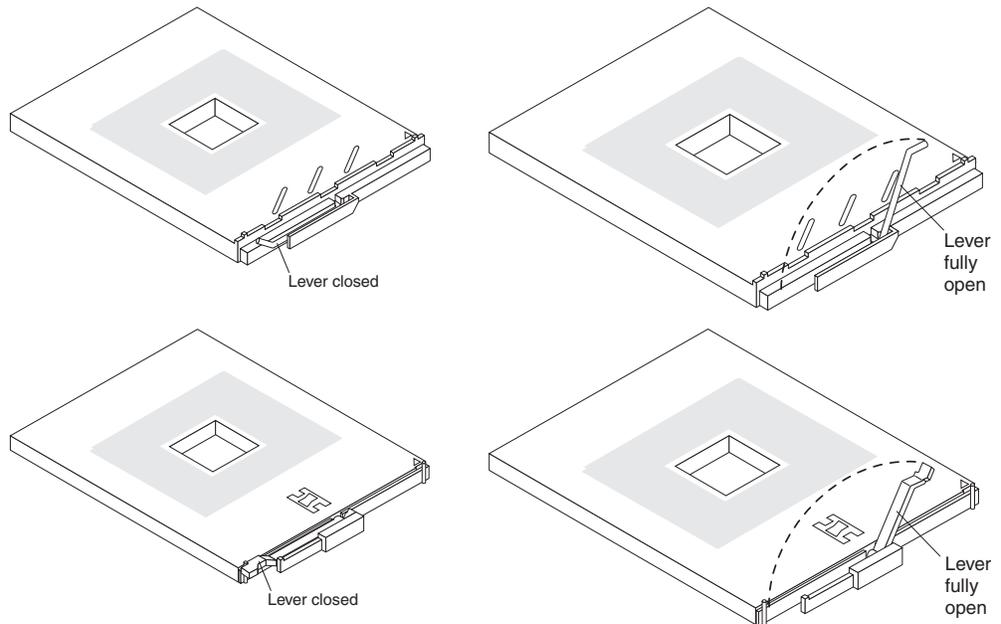
9. Lift the microprocessor out of the socket.
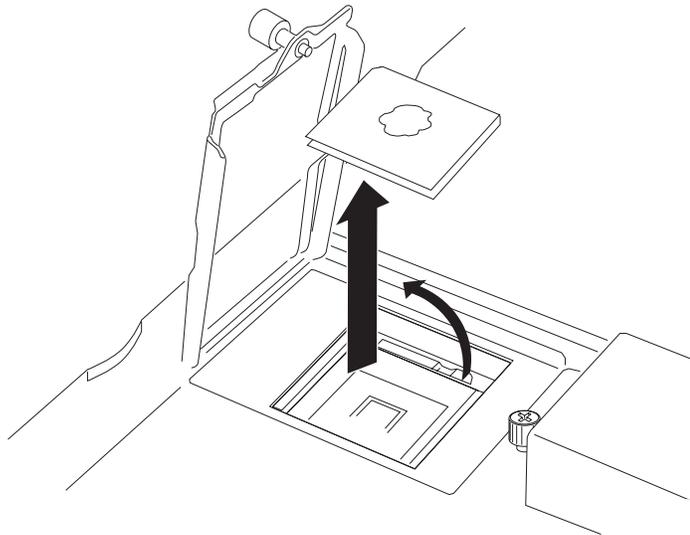
To install a microprocessor, see "Installing an additional microprocessor" on page 46 for instructions.

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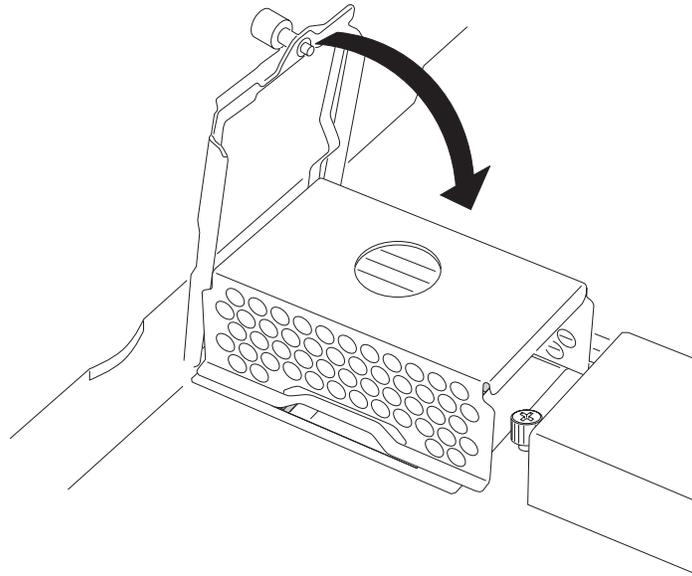
# Thermal grease

This section contains information about removing and replacing the thermal grease between the heat sink and the microprocessor. The thermal grease must be replaced whenever 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 33.
- Read the safety notices beginning on page 109.
- Read "Handling electrostatic discharge-sensitive devices" on page 112.

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 0.01 mL each on the top of the microprocessor.
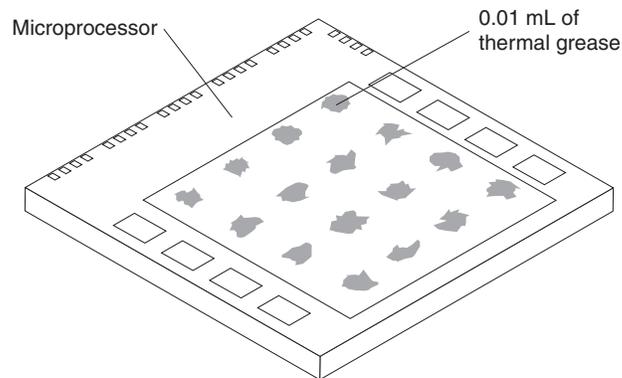


   **Note:** 0.01 mL is one tick mark on the syringe. If the grease is properly applied, approximately half (0.22 mL) of the grease will remain in the syringe.

6. Install the heat sink onto the microprocessor as described in "Installing an additional microprocessor" on page 46.

# Processor board

When replacing the processor 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 33.
- Read the safety notices beginning on page 109.

- Read "Handling electrostatic discharge-sensitive devices" on page 112.

Complete the following steps to remove the processor board:

1. Shut down the operating system, and turn off the blade server (see "Turning off the blade server" on page 7).
2. Remove the blade server from the BladeCenter unit (see "Removing the blade server from the BladeCenter unit" on page 39).
3. Remove the blade server bezel assembly (see "Removing the blade server bezel assembly" on page 42).
4. Remove the blade server cover (see "Opening the blade server cover" on page 40) or SCSI storage expansion unit (see "Installing a SCSI storage expansion unit" on page 51).
5. Pivot the I/O board tray to the upward position.
6. Remove all components (see the appropriate installation instructions and reverse the steps), and place them on a static-protective surface for reinstallation.
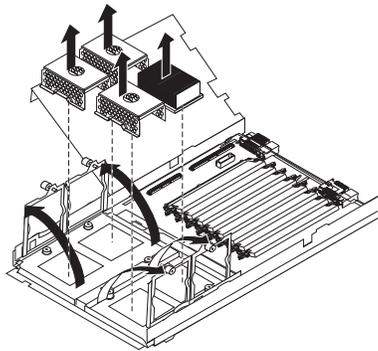
**Notes:**

a. A microprocessor assembly comes with a new heat sink.
b. A processor board does not come with a heat sink. When replacing the processor board and reinstalling an existing microprocessor, be sure to re-install the heat sink (see "Thermal grease" on page 72).

7. Remove the six screws that secure the heat-sink retention bracket to the processor board and the blade server chassis, and put the screws and the module in a safe place.
8. Remove the heat-sink retention bracket from the blade server.
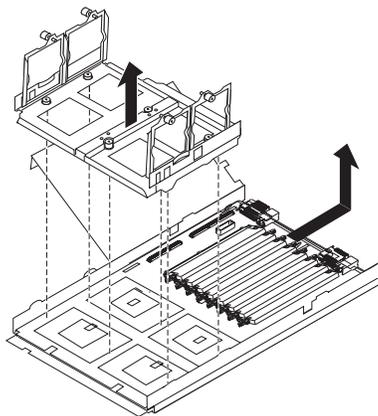
Note the alignment of the heat-sink retention bracket (the arrow on the bracket aligns with the arrow on the processor board). You will need to align the bracket the same way when reinstalling it.

9. Remove the processor board carefully from the blade server chassis.
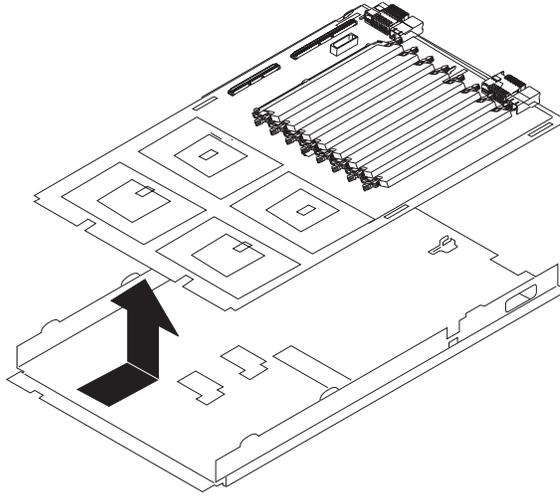
Reverse these steps to install the replacement processor board.

**Note:** Two self-adhesive labels come with the processor board. Apply one on top of the existing Ethernet MAC address label on the bottom of the blade chassis. The other label remains with the owner.

# I/O board

When replacing the I/O 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 33.
- Read the safety notices beginning on page 109.
- Read "Handling electrostatic discharge-sensitive devices" on page 112.

Complete the following steps to remove the I/O board:

1. Shut down the operating system, and turn off the blade server (see "Turning off the blade server" on page 7).
2. Remove the blade server from the BladeCenter unit (see "Removing the blade server from the BladeCenter unit" on page 39).
3. Remove the blade server bezel assembly (see "Removing the blade server bezel assembly" on page 42).
4. Remove the blade server cover (see "Opening the blade server cover" on page 40) or SCSI storage expansion unit (see "Installing a SCSI storage expansion unit" on page 51).
5. Pivot the I/O board tray to the upward position, and remove the cable connecting the I/O board to the processor board.
6. Remove all components (see the appropriate installation instructions and reverse the steps), and place them on a static-protective surface for reinstallation.

7. Remove the other seven screws that secure the I/O board to the blade chassis, and put the screws in a safe place.
8. Pull the I/O board carefully out of the blade chassis.
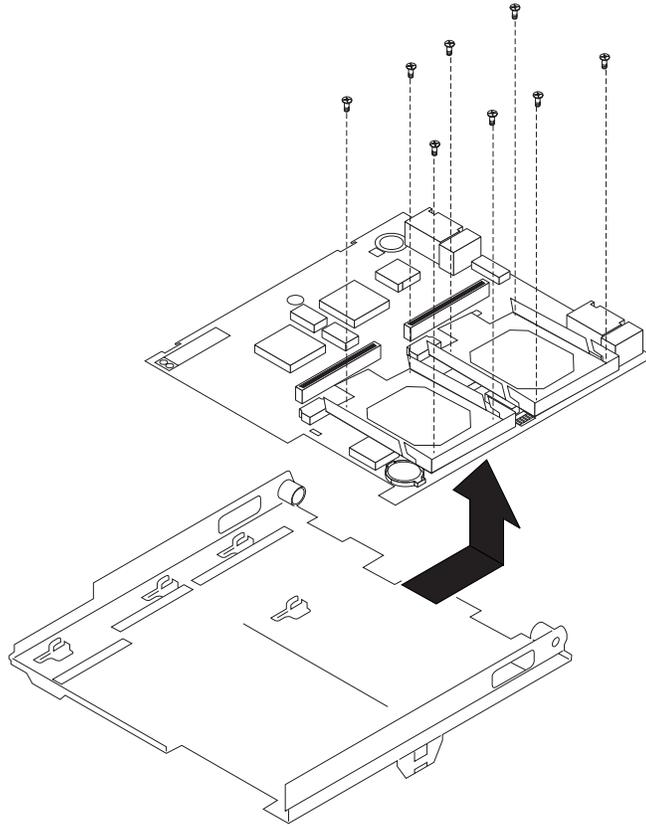
Reverse these steps to install the replacement I/O board.

# Chapter 6. Symptom-to-FRU index

Use this index to aid in locating failing or failed components in the HS40 Type 8839 blade server.

**Notes:**

1. Check the configuration before you replace a FRU. Configuration problems can cause false errors and symptoms.
2. For IBM devices not supported by this index, refer to the manual for that device.
3. Always start with "Checkout procedure" on page 21.

The symptom-to-FRU index lists symptoms, errors, and the possible causes of common failures. 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 column of the tables in this index lists error codes or messages, and the right 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 column, then restart the server to see if the problem has been corrected before taking further action.

**Note:** Reseat a suspected component or reconnect a cable before replacing the component.

POST error codes and messages are displayed on the screen and in the management-module error log.

## Beep codes

Beep symptoms are short tones or a series of short tones separated by pauses that indicate system-error conditions. Both the system BIOS and the baseboard management controller (BMC) emit beep codes (see the following two sections).

## BIOS-generated beep codes

The following table lists the POST error beep codes. Typically, prior to system video initialization, the BIOS uses these beep codes to inform users of error conditions.

| **Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Number of beeps/symptom** | **FRU/action** |
| **1**<br>(Memory refresh timer error) | 1. **DIMM**<br>2. Processor board |
| **6**<br>(Keyboard controller BAT test error) | 1. **I/O board**<br>2. Processor board |
| **7**<br>(General exception error.) | 1. **I/O board**<br>2. Processor board |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Number of beeps/symptom** | **FRU/action** |
| **5 short, 1 long**<br>(No memory found in system) | 1. **Install or reseat memory, then perform a blade server reset.**<br>2. DIMMs.<br>3. Processor board. |
| **6 short, 1 long**<br>(Memory is not DDR type) | 1. **Replace with supported DIMMs.**<br>2. DIMMs.<br>3. Processor board. |
| **7 short, 1 long**<br>(SMBUS error. Memory enumerations cannot proceed.) | 1. **Processor board**<br>2. I/O board |

## Baseboard management controller (BMC) beep codes

The following table lists the BMC error beep codes.

| Beep code/symptom | FRU/action |
|---|---|
| **1-5-1-1** (Microprocessor failure) | 1. **Microprocessor**<br>2. Processor board |
| **1-5-2-2** (No microprocessors) | 1. **Microprocessor**<br>2. Processor board |
| **1-5-2-3** (VID mismatch, population rules violation, microprocessor mismatch) | 1. **Make sure all microprocessors are supported by the BIOS and of the same family, model, stepping, speed, and cache size.**<br>2. Microprocessor. |
| **1-5-4-2** (Power fault: dc power unexpectedly lost) | 1. **Reseat blade server and power cycle the blade server.**<br>2. Reseat dc power cable.<br>3. Processor board.<br>4. I/O board. |
| **1-5-4-4** (Power control fault) | 1. **Reseat blade server and power cycle the blade server.**<br>2. Flex cable.<br>3. Auxiliary power cable.<br>4. Processor board.<br>5. I/O board. |

## No-beep symptoms

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **No-beep symptom** | **FRU/action** |
| **No beep and no video** (System error LED is OFF) | See **"Undetermined problems" on page 101.** |
| **No beep and no video** (System Attention LED is ON) | See **"Diagnosing problems using the light path diagnostics feature" on page 27.** |

# POST error codes

The following table lists error codes that might be sent to the management module for error logging as BMC pass-through error entries for the management module system-error log (SEL).

**Note:** The syntax of error logging between the management module and the SEL might be different. Local SEL error codes might differ from the SEL entries logged by the management module for identical event types.

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

| **Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Error code/symptom** | **FRU/action** |
| **0000**<br>(Timer error) | 1. **Run diagnostics.**<br>2. Battery.<br>3. I/O board. |
| **0005**<br>(CMOS checksum bad loading defaults) | **Information only; no action required.** |
| **0012**<br>(CMOS date/time not set) | **Run the Configuration/Setup Utility program, and set the date and time.** |
| **0040**<br>(Refresh timer test failed) | 1. **I/O board**<br>2. Processor board |
| **0044**<br>(DMA controller error) | **I/O board** |
| **0045**<br>(DMA-1 error) | **I/O board** |
| **0046**<br>(DMA-2 error) | **I/O board** |
| **004C**<br>(Keyboard/interface error) | **I/O board** |
| **004D**<br>(Primary master hard disk error) | 1. **Reset primary hard disk.**<br>2. Run diagnostics.<br>3. Primary hard disk.<br>4. I/O board. |
| **004F**<br>(Secondary master hard disk error) | 1. **Reset secondary hard disk.**<br>2. Run diagnostics.<br>3. Secondary hard disk.<br>4. I/O board. |
| **0055**<br>(Primary master drive - ATAPI incompatible) | **Primary master hard disk drive** |
| **0057**<br>(Secondary master drive - ATAPI incompatible) | **Secondary master hard disk drive** |
| **005D**<br>(ATA SMART failure error (dynamic string)) | **ATA drive** |

| Error code/symptom | FRU/action |
|---|---|
| **196** <br> (Processor cache mismatch detected) | 1. **Microprocessor** <br> 2. Processor board |
| **198** <br> (Processor speed mismatch detected) | 1. **Microprocessor** <br> 2. Processor board |
| **289** <br> (Non-matching or missing DIMMs, user has not installed DIMMs correctly, or DIMM disabled by POST or user) | 1. **Run the Configuration/Setup Utility program.** <br> 2. Disabled DIMM. <br> 3. System board |
| **8120** <br> (Microprocessor 1 thermal trip error) | 1. **Check cooling.** <br> 2. Replace blowers if needed. <br> 3. Run the Configuration/Setup Utility program, and enable the processor retest. <br> 4. Microprocessor 1. |
| **8121** <br> (Microprocessor 2 thermal trip error) | 1. **Check cooling.** <br> 2. Replace blowers if needed. <br> 3. Run the Configuration/Setup Utility program, and enable the processor retest. <br> 4. Microprocessor 2. |
| **8122** <br> (Microprocessor 3 thermal trip error) | 1. **Check cooling.** <br> 2. Replace blowers if needed. <br> 3. Run the Configuration/Setup Utility program, and enable the processor retest. <br> 4. Microprocessor 3. |
| **8123** <br> (Microprocessor 4 thermal trip error) | 1. **Check cooling.** <br> 2. Replace blowers if needed. <br> 3. Run the Configuration/Setup Utility program, and enable the processor retest. <br> 4. Microprocessor 4. |
| **8130** <br> (Microprocessor 1 disabled) | 1. **Run the Configuration/Setup Utility program, and enable the processor retest.** <br> 2. Microprocessor 1. |
| **8131** <br> (Microprocessor 2 disabled) | 1. **Run the Configuration/Setup Utility program, and enable the processor retest.** <br> 2. Microprocessor 2. |
| **8133** <br> (Microprocessor 3 disabled) | 1. **Run the Configuration/Setup Utility program, and enable the processor retest.** <br> 2. Microprocessor 3. |
| **8134** <br> (Microprocessor 4 disabled) | 1. **Run the Configuration/Setup Utility program, and enable the processor retest.** <br> 2. Microprocessor 4. |
| **8140** <br> (Microprocessor 1 failed FRB-3 timer) | 1. **Run the Configuration/Setup Utility program, and enable the processor retest.** <br> 2. Microprocessor 1. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Error code/symptom** | **FRU/action** |
| **8141**<br>(Microprocessor 2 failed FRB-3 timer) | 1. **Run the Configuration/Setup Utility program, and enable the processor retest.**<br>2. Microprocessor 2. |
| **8142**<br>(Microprocessor 3 failed FRB-3 timer) | 1. **Run the Configuration/Setup Utility program, and enable the processor retest.**<br>2. Microprocessor 3. |
| **8143**<br>(Microprocessor 4 failed FRB-3 timer) | 1. **Run the Configuration/Setup Utility program, and enable the processor retest.**<br>2. Microprocessor 4. |
| **8160**<br>(Microprocessor missing microcode) | 1. **Update BIOS code.**<br>2. Check latest BIOS release notes for supported microprocessors.<br>3. Replace microprocessor with supported microprocessor.<br>4. Update BIOS to current level. |
| **8180**<br>(BIOS does not support current stepping for microprocessor 1) | 1. **Replace microprocessor.**<br>2. Make sure that all microprocessors are the same stepping, speed, family, and cache size.<br>3. Update BIOS to current level. |
| **8192**<br>(L2 Cache size mismatch) | 1. **Microproocessor.**<br>2. Make sure all processors are the same stepping, speed, family, and cache size. |
| **8193**<br>(CPUID, Processor Stepping are different) | 1. **Make sure all processors are the same stepping, speed, family, and cache size.**<br>2. Microprocessor. |
| **8194**<br>(CPUID, Processor Family are different) | 1. **Make sure all processors are the same stepping, speed, family, and cache size.**<br>2. Microprocessor. |
| **8196**<br>(Processor Models are different) | 1. **Make sure all processors are the same stepping, speed, family, and cache size.**<br>2. Microprocessor. |
| **8197**<br>(CPU Speed mismatch) | 1. **Make sure all processors are the same stepping, speed, family, and cache size.**<br>2. Microprocessor. |
| **8300**<br>(Baseboard Management Controller failed to function) | 1. **Update the BMC and SDRs with the most current versions that are compatible with your system configuration.**<br>2. I/O board. |
| **8301**<br>(Front Panel Controller failed to function) | 1. **Microprocessor 1**<br>2. Microprocessor 2<br>3. Microprocessor 3<br>4. Microprocessor 4<br>5. Processor board |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Error code/symptom** | **FRU/action** |
| **84F2**<br>(Server management interface failed) | 1. **Update the BMC and SDRs with the most current versions that are compatible with your system configuration.**<br>2. I/O board. |
| **84F3**<br>(BMC in update mode) | 1. **The BMC recovery jumper is in the active position and the BMC can be updated.**<br>2. After updating the BMC, move the jumper to the inactive position. |
| **84F4**<br>(Sensor Data Record empty) | 1. **Update the BMC and SDRs with the most current versions that are compatible with your system configuration.**<br>2. I/O board.<br>3. Processor board. |
| **84FF**<br>(System Event Log full) | **Clear the System Event Log.** |
| **00150900**<br>(SERR/PERR detected on PCI bus.) | 1. **PCI-X adapter**<br>2. I/O board |
| **00151730**<br>(IMB parity/CRC error) | 1. **DIMM**<br>2. Processor board |

The following errors appear on the screen during POST and in the management-module error log.

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Error code/symptom** | **FRU/action** |
| Microprocessor 1 internal error (IERR) | 1. **Run the Configuration/Setup Utility program, and enable the microprocessor retest.**<br>2. Microprocessor 1.<br>3. Processor board. |
| Microprocessor 2 internal error (IERR) | 1. **Run the Configuration/Setup Utility program, and enable the microprocessor retest.**<br>2. Microprocessor 2.<br>3. Processor board. |
| Microprocessor 3 internal error (IERR) | 1. **Run the Configuration/Setup Utility program, and enable the microprocessor retest.**<br>2. Microprocessor 3.<br>3. Processor board. |
| Microprocessor 4 internal error (IERR) | 1. **Run the Configuration/Setup Utility program, and enable the microprocessor retest.**<br>2. Microprocessor 4.<br>3. Processor board. |

# Diagnostic error codes

**Note:** In the following error codes, if *XXX* is 000, 195, or 197, *do not* replace a FRU.

**000**    The blade server passed the test.

**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 Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician.

| Error code/symptom | FRU/action |
|---|---|
| **001-XXX-000** (Failed core tests) | **Processor board** |
| **001-XXX-001** (Failed core tests) | **Processor board** |
| **001-250-000** (Failed processor board ECC) | **Processor board** |
| **001-250-001** (Failed processor board ECC) | **Processor board** |
| **005-XXX-000** (Failed video test) | **Processor board** |
| **030-XXX-000** (Failed internal SCSI interface test) | 1. **SCSI storage expansion unit**<br>2. System board |
| **035-XXX-099** | 1. **No adapters were found.**<br>2. If adapter is installed re-check connection. |
| **075-XXX-000** (Failed power supply test) | **Power supply** |
| **089-XXX-001** (Failed microprocessor test) | 1. **Microprocessor 1**<br>2. System board |
| **089-XXX-002** (Failed optional microprocessor test) | 1. **Optional microprocessor 2**<br>2. System board |
| **089-XXX-003** (Failed microprocessor test) | 1. **Microprocessor 3**<br>2. System board |
| **089-XXX-004** (Failed optional microprocessor test) | 1. **Optional microprocessor 4**<br>2. System board |
| **165-060-000** (Service Processor: ASM may be busy) | 1. **Rerun the diagnostic test.**<br>2. Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel.<br>3. Power down the blade server, and reseat it in the chassis.<br>4. System board. |

**Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician.

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**Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician.

| Error code/symptom | FRU/action |
|---|---|
| **165-198-000** (Service Processor: Aborted) | 1. **Rerun the diagnostic test**<br>2. Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel.<br>3. Power down the blade server, and reseat it in the chassis.<br>4. System board. |
| **165-201-000** (Service Processor: Failed) | 1. **Power down blade server and reseat it in chassis.**<br>2. System board. |
| **165-330-000** (Service Processor: Failed) | **Update to the latest ROM diagnostic level and retry** |
| **165-342-000** (Service Processor: Failed) | 1. **Ensure latest firmware levels for ASM and BIOS are installed.**<br>2. Power down the blade server, and reseat it in the chassis.<br>3. System board. |
| **166-198-000 System Management: Aborted**<br>(Unable to communicate with ASM. It may be busy. Run the test again.) | 1. **Run the diagnostic test again.**<br>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.<br>3. Power down the blade server, and reseat it in the chassis.<br>4. System board. |
| **166-201-001 System Management: Failed**<br>(I2C bus error(s) See SERVPROC and DIAGS entries in event log.) | 1. **DIMMs**<br>2. System board |
| **166-201-002 System Management: Failed**<br>(I2C bus error(s) See SERVPROC and DIAGS entries in event log.) | 1. **Reseat I2C cable between the operator information card and the system board.**<br>2. Operator information card.<br>3. System board. |
| **166-201-003 System Management: Failed**<br>(I2C bus error(s) See SERVPROC and DIAGS entries in event log.) | 1. **I/O adapter**<br>2. System board |
| **166-201-004 System Management: Failed**<br>(I2C bus error(s) See SERVPROC and DIAGS entries in event log.) | 1. **SCSI storage expansion unit**<br>2. System board |
| **166-201-005 System Management: Failed**<br>(I2C bus error(s) See SERVPROC and DIAGS entries in event log.) | 1. **DIMMs**<br>2. Microprocessors<br>3. System board |
| **166-342-000 System Management: Failed**<br>(ASM adapter BIST indicate failed tests.) | 1. **Ensure the latest firmware levels for Remote Supervisor Adapter and BIOS are installed.**<br>2. Power down the blade server, and reseat it in the chassis.<br>3. Remote Supervisor Adapter. |
| **166-400-000 System Management: Failed**<br>(ISMP self test result failed tests: *x* where *x* = Flash, RAM, or ROM.) | 1. **Reflash or update firmware for ISMP.**<br>2. System board. |
| **167-300-XXX ISMP: Failed**<br>(ISMP indicates failure in self test.) | 1. **Remove and reinstall the blade server in the BladeCenter unit.**<br>2. Reflash or update firmware for ISMP.<br>3. I/O board. |

| | |
|---|---|
| **Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
| **Error code/symptom** | **FRU/action** |
| **167-400-001 ISMP: Failed** (ISMP failed to communicate with I/O board.) | **I/O board** |
| **167-400-002 ISMP: Failed** (ISMP failed to communicate with processor board.) | 1. **Processor board** <br> 2. I/O board |
| **167-400-003 ISMP: Failed** (ISMP failed to communicate with processors.) | 1. **Processor board** <br> 2. I/O board <br> 3. Microprocessor |
| **167-400-004 ISMP: Failed** (ISMP failed to communicate with DIMMs.) | 1. **Processor board** <br> 2. I/O board <br> 3. DIMMs |
| **180-XXX-001** (Failed front LED panel test.) | 1. **Front panel** <br> 2. I/O board |
| **180-XXX-000** (Diagnostics LED failure) | **Run diagnostics panel LED test for the failing LED.** |
| **180-XXX-001** (Failed front LED panel test) | 1. **Front bezel with customer interface card** <br> 2. System board |
| **180-XXX-002** (Failed diagnostics LED panel test) | **System board** |
| **180-XXX-003** (Failed system board LED test) | **System board** |
| **180-XXX-005** (Failed SCSI backplane LED test) | 1. **SCSI storage expansion unit** <br> 2. System board |
| **201-XXX-0nn** (Failed memory test.) | 1. **Replace DIMM nn, where *nn* is the DIMM number.** <br> 2. System board. |
| **201-XXX-Y99** (Multiple DIMM failure, see error text) | 1. **Isolate the failing DIMM.** <br>   a. Replace a DIMM in bank with a known good DIMM. <br>   b. Rerun memory diagnostic for the failing bank. <br>   c. If test fails, mark replaced DIMM as good DIMM. <br>   d. If test passes, mark replaced DIMM as bad DIMM. <br>   e. If DIMM tested is bad, replace the bad DIMM. <br>   f. If DIMM tested is good, do not replace it. <br> 2. Repeat steps 1a through 1f with other DIMMs in the failing bank until the error is corrected. <br> 3. If error is not corrected, replace system board. |
| **202-XXX-001** (Failed system cache test) | 1. **Microprocessor 1** <br> 2. System board |
| **202-XXX-002** (Failed system cache test) | 1. **Microprocessor 2** <br> 2. System board |
| **202-XXX-003** (Failed system cache test) | 1. **Microprocessor 3** <br> 2. System board |

**Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician.

| Error code/symptom | FRU/action |
|---|---|
| **202-XXX-004** <br> (Failed system cache test) | 1. **Microprocessor 4** <br> 2. System board |
| **217-198-XXX** <br> (Could not establish drive parameters) | **SCSI storage expansion unit** |
| **217-XXX-000** <br> (Failed hard disk drive test) <br> **Note:** If RAID is configured, the hard disk drive number refers to the RAID logical array. | **Hard disk drive 1** |
| **217-XXX-001** <br> (Failed hard disk test) <br> **Note:** If RAID is configured, the hard disk number refers to the RAID logical array. | **Hard disk drive 2** |
| **405-XXX-000** <br> (Failed Ethernet test on controller on the system board) | 1. **Verify that Ethernet is not disabled in BIOS.** <br> 2. System board. |

# Light path diagnostics

| Lit blade-error 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 error** | A memory error occurred. | 1. **Reseat the DIMM indicated by the lit DIMM failure LED.** <br> 2. Replace the DIMM. <br><br> **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 board fault** | The integrated VRM on the blade server processor board has failed. | 1. **Replace the blade server cover, reinsert the blade server in the system chassis, and then restart the blade server.** (See "Removing the blade server from the BladeCenter unit" on page 39 for instructions). <br> 2. Replace the processor board. |
| **I/O board fault** | The integrated VRM on the blade server I/O board has failed. | 1. **Replace the blade server cover, reinsert the blade server in the system chassis, and then restart the blade server.** (See "Removing the blade server from the BladeCenter unit" on page 39 for instructions). <br> 2. Replace the I/O board. |

| Lit blade-error LED | Cause | Action |
|---|---|---|
| **Board temperature error** | The system temperature has exceeded a threshold level. | 1. **Check to see if a blower on the BladeCenter unit has failed. If it has, replace the blower.**<br>2. Make sure the room temperature is not too high. (See "Features and specifications" on page 4 for temperature information.)<br>3. Check the management module for ThermTrip errors and replace microprocessors as needed. |
| **Processor x error** | The microprocessor has failed. | 1. **Make sure that the microprocessor indicated by the lit LED is installed correctly.** (See "Installing an additional microprocessor" on page 46 for installation instructions).<br>2. Replace the microprocessor. |
| **Processor mismatch** | The processors do not match. | **Make sure that all microprocessors have the same cache size and type and the same clock speed. Internal and external clock frequencies must be identical; also see "Error symptoms."** |
| **BMC fault** | The BMC self-test has detected a failure | 1. **Reset and initialize the blade server and I/O board.**<br>2. Replace the I/O board. |
| **NMI error** | A non-maskable interrupt has occurred. | 1. **Replace the blade server cover, reinsert the blade server in the BladeCenter unit, and then restart the blade server.**<br>2. Check the system error log for information about the error.<br>3. Replace the processor board and the I/O board. See "Processor board" on page 72 and "I/O board" on page 74 for instructions. |

# 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 26 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, reseat the component and replace it if necessary. The most likely cause of the symptom is listed first.

| **Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 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.** | 1. **Make sure that:**<br>  • All cables and jumpers are installed correctly.<br>  • The correct device driver is installed for the CD-ROM drive.<br>2. Run CD-ROM drive diagnostics.<br>3. CD-ROM drive. |
| **CD is not working properly.** | 1. **Clean the CD.**<br>2. Run CD-ROM drive diagnostics.<br>3. CD-ROM drive. |
| **CD-ROM drive tray is not working.** (The server must be turned on.) | 1. **Insert the end of a straightened paper clip into the manual tray-release opening.**<br>2. Run CD-ROM drive diagnostics.<br>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.) | **Establish a link between /dev/sr0 and /dev/cdrom as follows:**<br>1. Enter the following command:<br>   `rm /dev/cdrom; ln -s /dev/sr0 /dev/cdrom`<br>2. Insert the following line in the /etc/fstab file:<br>   `/dev/cdrom /media/cdrom auto ro,noauto,user,exec 0 0` |
| **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).) | **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. 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:<br>1. Double-click the Unplug or Eject Hardware icon in the Windows taskbar at the bottom right of the screen.<br>2. Select USB Floppy and click Stop.<br>3. Select USB Mass Storage Device and click Stop.<br>4. Click Close.<br><br>You can now safely switch ownership of the media tray to another blade server. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 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.** | 1. **If there is a diskette in the drive, make sure that:**<br>• The diskette is inserted correctly in the drive.<br>• The diskette is good and not damaged. (Try another diskette if you have one.)<br>  – The drive light comes on (one-second flash) when the diskette is inserted.<br>• The diskette contains the necessary files to start the computer.<br>• The diskette drive is enabled in the Configuration/Setup utility program.<br>• The software program is working properly.<br>• The cable is installed correctly (in the proper orientation).<br>2. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.).<br>3. Cable.<br>4. Run diskette drive diagnostics.<br>5. Diskette drive.<br>6. Media tray card. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 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.** | 1. **Make sure that the enclosure is installed correctly.**<br>2. For more information, see your SCSI storage expansion unit documentation. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 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** | **Broken CRU/FRU** |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 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).** | 1. **Remove the first drive not recognized and try the hard disk drive diagnostic test again.**<br>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.** | 1. **Remove the hard disk drive being tested when the computer stopped responding and try the diagnostic test again.**<br>2. If the hard disk drive diagnostic test runs successfully, replace the drive you removed with a new one. |

| **Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 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.** | **Make sure that:**<br>• When the server is turned on, air is flowing from the rear of the server at the blower grill. If there is no airflow, the blower is not working. This causes the server to overheat and shut down.<br>• Ensure that the SCSI bus and devices are configured correctly. |

| **Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 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.** | 1. **Make sure that:**<br>   • The keyboard cable is securely connected to the BladeCenter management module, and the keyboard and mouse cables are not reversed.<br>   • Both the computer and the monitor are turned on.<br>2. Keyboard.<br>3. Management module on the BladeCenter unit; see the IBM *BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *BladeCenter Documentation* CD. |
| **The mouse or pointing device does not work.** | 1. **Make sure that:**<br>   • The keyboard/mouse/video select button LED on the front of the blade server is lit, indicating that the blade server is connected to the shared BladeCenter monitor.<br>   • The mouse or pointing-device cable is securely connected to the BladeCenter management module, and that the keyboard and mouse cables are not reversed.<br>   • The mouse works correctly with other blade servers.<br>   • The mouse device drivers are installed correctly.<br>   • Both the computer and the monitor are turned on.<br>   • 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.<br>2. Mouse or pointing device.<br>3. Management module on the BladeCenter unit; see the IBM *BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *BladeCenter Documentation* CD. |
| **Mouse function lost during Red Hat installation.** | **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.**<br><br>Do not switch KVM owners until the installation process begins to install the packages (after the 'About to Install' window). |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 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.** | 1. **Make sure that:**<br>  • The memory modules are seated properly.<br>  • You have installed the correct type of memory.<br>  • If you changed the memory, you updated the memory configuration with the Configuration/Setup Utility program.<br>  • 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.<br>2. Check POST error log for error message 289:<br>  • If the DIMM was disabled by a system-management interrupt (SMI), replace the DIMM.<br>  • If the DIMM was disabled by the user or by POST:<br>    a. Start the Configuration/Setup Utility program.<br>    b. Enable the DIMM.<br>    c. Save the configuration and restart the computer.<br>3. DIMM.<br>4. System board. |
| **Some memory is disabled in memory diagnostics.** | **Start the Configuration/Setup Utility program** (see "Starting the Configuration/Setup Utility program" on page 11), and disable hot spare memory; then, run the diagnostics test again. |


| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 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.) | 1. **Make sure that the startup microprocessor is seated properly.**<br>2. Startup microprocessor. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Monitor problems** | |
| **Symptom** | **FRU/action** |
| **Testing the monitor.** | **See the information that comes with the monitor** for adjusting and testing instructions. (Some IBM monitors have their own self-tests.) |
| **The screen is blank.** | 1. **Make sure that:**<br>• The keyboard/mouse/video select button LED on the front of the blade server is lit, indicating that the blade server is connected to the shared BladeCenter monitor.<br>• The system power cord is plugged into the BladeCenter power module and a working electrical outlet.<br>• The monitor cables are connected properly.<br>• The monitor is turned on and the Brightness and Contrast controls are adjusted correctly.<br>• If the computers are C2T chained together, verify that:<br>  – The C2T chain cables are securely connected to the computers.<br>  – The C2T breakout cable is connected properly.<br>  – A computer that is turned on is selected.<br><br>**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).<br><br>2. If you have verified these items and the screen remains blank, replace:<br>  a. Monitor<br>  b. Management module on the BladeCenter (see the IBM *BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide*). |
| **Only the cursor appears.** | **Make sure 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 101. |
| **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.** | **Make sure 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.<br><br>If you still cannot find the problem, try using the monitor with another blade server. If the problem persists, see the IBM *BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *BladeCenter Documentation* CD. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 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.** | 1. **If the monitor self-tests show the monitor is working properly, consider the location of the monitor.** Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. (Moving a color monitor while it is turned on might cause screen discoloration.) Then move the device and the monitor at least 305 mm (12 in.) apart. Turn on the monitor.<br><br>**Notes:**<br>  a. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.).<br>  b. Non-IBM monitor cables might cause unpredictable problems.<br>  c. An enhanced monitor cable with additional shielding is available for the 9521 and 9527 monitors. For information about the enhanced monitor cable, contact your IBM reseller or IBM marketing representative.<br><br>2. Monitor.<br>3. System board. |
| **Wrong characters appear on the screen.** | 1. **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.**<br>2. Monitor.<br>3. System board. |
| **No video.** | 1. **Make sure the correct machine is selected, if applicable.**<br>2. Make sure all cables are locked down. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 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.** | 1. **Make sure that:**<br>  • The option is designed for the server (see the ServerProven list on the World Wide Web at http://www.ibm.com/pc/us/compat/).<br>  • You followed the installation instructions that came with the option.<br>  • The option is installed correctly.<br>  • You have not loosened any other installed options or cables and that all option hardware and cable connections are secure.<br>  • If the failing option is a SCSI storage expansion unit:<br>    – The cables for the SCSI expansion unit are connected correctly.<br>    – If the SCSI storage expansion unit has been removed, verify that the socket is terminated correctly.<br>    – The external SCSI expansion unit is turned on. You must turn on the external SCSI expansion unit before turning on the server.<br>  • You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration.<br><br>2. If the option comes with its own test instructions, use those instructions to test the option.<br>3. Replace the option you just installed. |

| **Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 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.** | 1. **Reseat connector.**<br>2. Front bezel with customer card.<br>3. System board. |
| **The blade server does not turn on.** | 1. **Make sure that:**<br>  a. The power LED on the front of the BladeCenter unit is on.<br>  b. The LEDs on all the BladeCenter power modules are on.<br>  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.<br>  d. The power-on LED on the blade server control panel is blinking slowly.<br>    • 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<br>    • 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.<br>  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.<br>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.<br>3. Try another blade server in the blade bay; if it works, replace the faulty blade server.<br>4. See "Undetermined problems" on page 101. |
| **The blade server does not turn on and the following conditions are present:**<br><br>1. The amber system error LED on the Blade Center unit system LED panel is lit;<br>2. The amber blade error LED on the blade server LED panel is lit; and<br>3. The system error log contains the message ″CPUs mismatched″. | **The microprocessor with the lowest feature set must be used as the startup microprocessor (microprocessor 1; see "Processor board components" on page 35).** Move the microprocessor in location U66 to location U70, and move the microprocessor in location U70 to location U66. |
| **The blade server turns off for no apparent reason** | 1. **Make sure 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.<br>2. If microprocessor LED is illuminated, replace the microprocessor. |
| **The blade server does not turn off.** | 1. **Determine whether you are using an ACPI or non-ACPI operating system.** If you are using a non-ACPI operating system:<br>  a. Press Ctrl+Alt+Delete.<br>  b. Turn off the system by holding the power-control button for 4 seconds.<br>  c. If computer fails during BIOS POST and power-control button does not work, remove the blade server from the bay and reseat it.<br>2. If the problem remains or if you are using an ACPI-aware operating system, suspect the system board. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components are replaceable by the customer and which components must be replaced by an IBM field service technician. | |
| --- | --- |
| **ServerGuide problems** | |
| **Symptom** | **FRU/action** |
| Setup and Installation CD will not start. | • **Make sure that the server supports the ServerGuide program and has a startable (bootable) CD-ROM (or DVD-ROM) drive.**<br>• If the startup (boot) sequence settings have been altered, make sure that the CD-ROM drive is first in the startup sequence.<br>• If more than one CD-ROM drive is installed, make sure that only one drive is set as the primary drive. Start the CD from the primary drive. |
| SCSI RAID program cannot view all installed drives the operating system cannot be installed. | • **Make sure that there are no duplicate SCSI IDs or IRQ assignments.**<br>• Make sure that the hard disk drive is connected properly. |
| The operating-system Installation program continuously loops. | **Make more space available on the hard disk.** |
| ServerGuide will not start the operating-system CD. | **Make sure that the NOS CD you have is supported by the ServerGuide program.** See the CD label for a list of supported NOS versions. |
| The operating system cannot be installed; the option is not available. | **Make sure that the operating system is supported on the server.** If the operating system is supported, either there is no logical drive defined (SCSI RAID systems), or the ServerGuide System Partition is not present. Run the ServerGuide program, and make sure that setup is complete. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
| --- | --- |
| **Software problem** | |
| **Symptom** | **FRU/action** |
| **Suspected software problem**. | 1. **To determine if problems are caused by the software, verify that:**<br>  • The computer has the minimum memory needed to use the software. For memory requirements, see the information that comes with the software.<br>  **Note:** If you have just installed an adapter or memory, you might have a memory address conflict.<br>  • The software is designed to operate on the computer.<br>  • Other software works on the computer.<br>  • The software that you are using works on another system.<br><br>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.<br><br>2. If you have verified these items and the problem remains, contact your place of purchase. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 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.** | Make sure that:<br>• The correct USB device driver is installed.<br>• The operating system supports USB devices. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 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.** | **Make sure that:**<br>• The switch modules for the network interface being used are installed in the correct BladeCenter bays and are configured and operating correctly. See the IBM *BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *BladeCenter Documentation* CD for details.<br>• The settings in the switch module are appropriate for the blade server (settings in the switch module are blade-specific).<br><br>If you installed an I/O expansion option, verify that:<br>• The option is designed for the blade server.<br>• You followed the installation instructions that came with the option.<br>• The option is installed correctly.<br>• You have not loosened any other installed options or cables.<br>• You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration.<br><br>If the problem remains, see "Undetermined problems" on page 101. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 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 101 and the IBM *BladeCenter Type 8677 Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *BladeCenter Documentation* CD. |

# Error messages and error codes

The system BIOS displays error messages on the video screen during POST if errors are detected. POST error codes are logged in the event log.

The blade server has local system event log logging capability. The local system event log is stored in and updated by the baseboard management controller (BMC). For information about accessing the system event log, see "Viewing the test log" on page 27. System event log entries logged by the BMC and system event log entries logged by the management module might be different for the same event type.

# Service processor error messages

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

When viewed from the system-error log, service processor error messages will appear as text. To determine a possible error condition for the service processor, the system-error log (see "System errors" on page 100) 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:<br>• A failing SCSI device (adapter, drive)<br>• An improper SCSI configuration<br>• Duplicate SCSI IDs in the same SCSI chain | **Make sure that the SCSI devices are configured correctly.** |

# Temperature error messages

**Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician.

| Message | Action |
|---|---|
| **System over temperature for CPU *x*.** | 1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 33.<br>2. Replace microprocessor *x*. |
| **Blade Storage Expansion option over recommended temperature.** | 1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 33.<br>2. Replace the SCSI hard disk drives.<br>3. Replace the Blade Storage Expansion option. |
| **CPU *x* over temperature.** | 1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 33.<br>2. Replace microprocessor *x*. |

# Power error messages

**Note:** See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician.

| Message | Action |
|---|---|
| **BSE +12V over recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade storage expansion option.<br>3. Replace blade storage expansion option. |
| **BSE +12V under recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade storage expansion option.<br>3. Replace blade storage expansion option. |
| **BSE +5V over recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade storage expansion option.<br>3. Replace blade storage expansion option. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Message** | **Action** |
| **BSE +5V under recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*). <br> 2. Reseat blade storage expansion option. <br> 3. Replace blade storage expansion option. |
| **BSE +18V over recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*). <br> 2. Reseat blade storage expansion option. <br> 3. Replace blade storage expansion option. |
| **BSE +18V under recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*). <br> 2. Reseat blade storage expansion option. <br> 3. Replace blade storage expansion option. |
| **BSE +3.3V over recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*). <br> 2. Reseat blade storage expansion option. <br> 3. Replace blade storage expansion option. |
| **BSE +3.3V under recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*). <br> 2. Reseat blade storage expansion option. <br> 3. Replace blade storage expansion option. |
| **BSE +2.5V over recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*). <br> 2. Reseat blade storage expansion option. <br> 3. Replace blade storage expansion option. |
| **BSE +2.5V under recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*). <br> 2. Reseat blade storage expansion option. <br> 3. Replace blade storage expansion option. |
| **BSE +1.8V over recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*). <br> 2. Reseat blade storage expansion option. <br> 3. Replace blade storage expansion option. |
| **BSE +1.8V under recommended voltage** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*). <br> 2. Reseat blade storage expansion option. <br> 3. Replace blade storage expansion option. |
| **System Power Good fault** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*). <br> 2. Reseat blade server. <br> 3. Replace blade server. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Message** | **Action** |
| **VRM Power Good fault** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **System over recommended voltage for +12v.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **System over recommended voltage for +1.25v.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **System over recommended voltage for +1.5v.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **System over recommended voltage for +2.5v.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **System over recommended voltage for +3.3v.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **System over recommended 5V fault.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **VRM voltage over recommended tolerance.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **System under recommended voltage for +12v.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **System under recommended voltage for +1.25v.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Message** | **Action** |
| **System under recommended voltage for +1.5v.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **System under recommended voltage for +2.5v.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **System under recommended voltage for +3.3v.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |
| **System under recommended 5V fault.** | 1. **Check BladeCenter power** (see IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*).<br>2. Reseat blade server.<br>3. Replace blade server. |

## System shutdown

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

## System errors

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Message** | **Action** |
| **Internal Error CPU x fault** | 1. **Reseat:**<br>  a. I/O Expansion Option<br>  b. Blade Storage Expansion option.<br>  c. IDE hard drive.<br>2. Replace:<br>  a. Failing PCI adapter<br>  b. Microprocessor *x*.<br>  c. I/O Expansion Option.<br>  d. Blade Storage Expansion option.<br>  e. IDE hard drive.<br>  f. System board. |

# Temperature-related system shutdown

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Message** | **Action** |
| **System shutoff due to CPU x over temperature** | 1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 33.<br>2. Replace microprocessor *x*. |
| **System shutoff due to Blade Storage Expansion option temperature** | 1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 33.<br>2. Replace Blade Storage Expansion option. |
| **CPU x shut off due to over temperature** | 1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 33.<br>2. Replace microprocessor *x*. |
| **Critical Blower Failure, blade server powering down** | **See IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*.** |
| **Power Modules are over temperature, blade server powering down** | **See IBM BladeCenter Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*.** |

# Hard disk drive checkout

| Note: See Chapter 7, "Parts listing, Type 8839," on page 105 to determine which components should be replaced by a field service technician. | |
|---|---|
| **Message** | **Action** |
| **Hard drive x removal detected**<br>(level-critical; hard drive x has been removed) | **Information only, take action as appropriate.** |

# Undetermined problems

> **Note:** When troubleshooting a problem in the blade server, you must determine 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 Type 8677 *Hardware Maintenance Manual and Troubleshooting Guide*.

Use the information in this section if the diagnostic tests did not diagnose 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 30).

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 turn on 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)

   The following components are required, at a minimum, for the blade server to operate:
   - System board
   - One microprocessor
   - Memory (with a minimum of two 256 MB DIMMs)
   - 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 is solved when you remove an I/O adapter from the blade server and replacing that I/O adapter does not correct the problem, suspect the system board.
2. If you suspect a networking problem and the blade server passes all the system tests, suspect a network cabling problem external to the blade server.

# Problem determination tips

Because of the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.
- Machine type and model
- Microprocessor or hard disk upgrades
- Failure symptom:
  - Does the server fail the diagnostics tests?
  - What, when, where, single, or multiple servers?
  - Is the failure repeatable?
  - Has this configuration ever worked?

- If it has been working, what changes were made 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 code level
- Operating system software
  - Type and version level

**Note:** To eliminate confusion, blade servers are considered identical only if they:

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

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

# Chapter 7. Parts listing, Type 8839

This parts listing supports the HS40 Type 8839 blade server models 21X, 31X, 41X,51X, 61X, 71X, and 6TX.
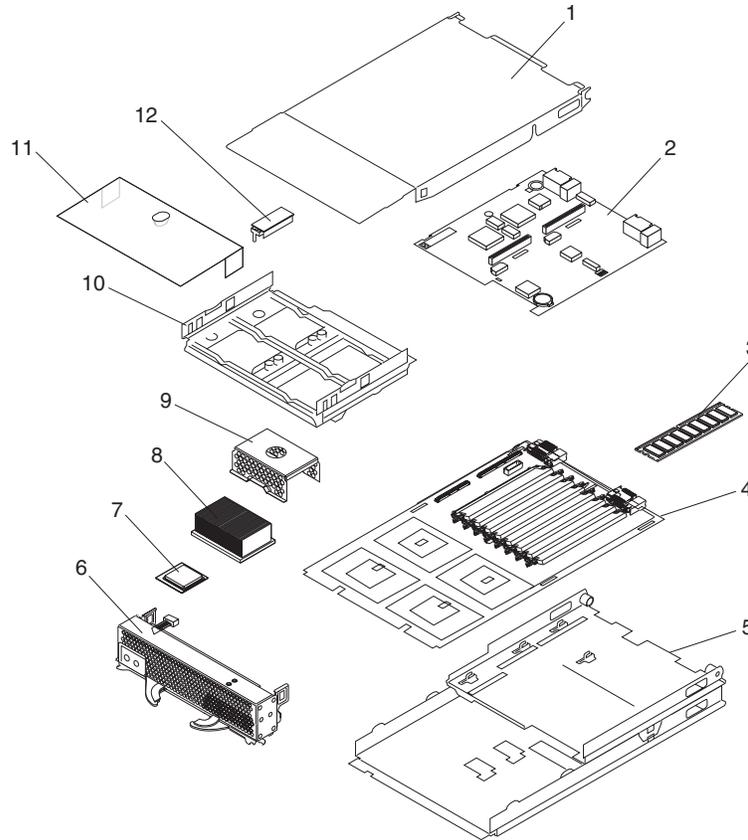


**Note:** Field replaceable units (FRUs) should be serviced only by qualified field service technicians. Customer replaceable units can be replaced by the customer.

| Index | System, Type 8839 (model 21X, 31X) | FRU No. | CRU/FRU |
|---|---|---|---|
| 1 | Top cover (all models) | 02R9149 | CRU |
| 2 | I/O board (all models) | 13N1607 | FRU |
| 3 | Memory module, 256 MB PC2100 ECC (21X, 51X, 61X, 71X, 6TX) | 09N4306 | CRU |
| 3 | Memory module, 512 MB PC2100 ECC (21X, 51X, 61X, 71X, 6TX) | 09N4307 | CRU |
| 3 | Memory module, 1GB PC2100 ECC (31X, 41X) | 09N4308 | CRU |
| 3 | Memory module, 2GB PC2100 ECC (all models) | 09N4309 | FRU |
| 4 | Processor board (all models) | 13N1605 | FRU |
| 5 | Mechanical base (all models) | 25K9807 | FRU |
| 6 | Front bezel (21X, 31X, 41X, 51X, 61X, 71X) | 25K9810 | CRU |
| 6 | Front bezel (6TX) | 25K9810 | CRU |
| 7 | Microprocessor, 2.2 GHz/400 MHz (51X) | 26K5854 | CRU |
| 7 | Microprocessor, 2.7 GHz/400 MHz (61X, 6TX) | 26K5855 | CRU |
| 7 | Microprocessor, 3.0 GHz/400 MHz (71X) | 26K5856 | CRU |
| 7 | Microprocessor, 2.0 GHz/400 MHz (21X) | 49P3167 | CRU |
| 7 | Microprocessor, 2.5 GHz/400 MHz (31X) | 49P3168 | CRU |
| 7 | Microprocessor, 2.8 GHz/400 MHz (41X) | 49P3169 | CRU |
| 8 | Heat sink (all models) | 90P0974 | CRU |

| Index | System, Type 8839 (model 21X, 31X) | FRU No. | CRU/FRU |
|---|---|---|---|
| 9 | Heat-sink filler (all models) | 90P4041 | CRU |
| 10 | Heat-sink retention module (all models) | 49P2658 | FRU |
| 11 | Air baffle (all models) | 90P4038 | CRU |
| 12 | IMB bus terminator card (all) | 59P6614 | CRU |
| | Adapter (all models) | 73P6001 | CRU |
| | Alcohol kit (all models) | 59P4739 | FRU |
| | Grease, thermal (all models) | 59P4740 | CRU |
| | Base, Blade (all models) | 02R9160 | FRU |
| | Battery, 3.0 volt (all models) | 16G8095 | CRU |
| | Blade cover (all models) | 90P4796 | CRU |
| | Cable kit (all models) | 90P4044 | CRU |

- Flex cables (3)
- DC power cable, 225MM (1)

| | | | |
|---|---|---|---|
| | Fibre channel adapter tray (optional) | 49P2514 | CRU |
| | Fibre channel card (optional) | 59P6624 | CRU |
| | Gigabit Ethernet daughter card | 13N2306 | CRU |
| | System service label | 25K9830 | CRU |
| | Warning label (all models) | 90P4799 | FRU |
| | Miscellaneous parts kit (all models) | 02R9003 | FRU |

- 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. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM *xSeries Documentation* CD or in the IntelliStation *Hardware Maintenance Manual* at the IBM Support Web site.
- Go to the IBM Support Web site at http://www.ibm.com/pc/support/ to check for technical information, hints, tips, and new device drivers or to submit a request for information.

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

## Using the documentation

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

# Getting help and information from the World Wide Web

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

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

# Software service and support

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

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

# Hardware service and support

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

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

# Appendix B. Safety information

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

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

## General safety

Follow these rules to ensure general safety:

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

# Electrical safety

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

Observe the following rules when working on electrical equipment.

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

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

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

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

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

## Safety inspection guide

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

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

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

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

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

b. The power cord should be the appropriate type as specified in the parts listings.

c. Insulation must not be frayed or worn.

4. Remove the cover.

5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.

6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.

7. Check for worn, frayed, or pinched cables.

8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

## Handling electrostatic discharge-sensitive devices

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

**Notes:**

1. Use product-specific ESD procedures when they exceed the requirements noted here.

2. Make sure that the ESD-protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

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

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

  – Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.

  – Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.

  – Use the round ground-prong of the AC plug on AC-operated computers.

## Grounding requirements

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

# Safety notices (multi-lingual translations)

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

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

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

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

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

**Statement 1**

**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 procedure**s.
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

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

**Statement 2**

⚠️

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

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

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

**Statement 3**

⚠️

**CAUTION:**
**When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:**
* **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
* **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**
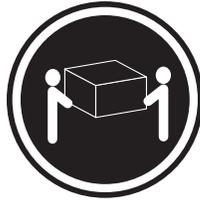
⚠️

**DANGER**

> **Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:**
>
> **Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.**

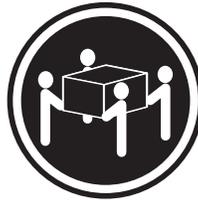**Statement 4**



≥18 kg (39.7 lb)        ≥32 kg (70.5 lb)        ≥55 kg (121.2 lb)

**CAUTION:**
**Use safe practices when lifting.**

**Statement 5**



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



**Statement 10**

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



**Statement 20**



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

**Statement 21**

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

**Importante:**

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

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

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

**Instrução 1**



**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: |
|---|---|
| 1. DESLIGUE Tudo. <br> 2. Primeiramente, conecte todos os cabos aos dispositivos. <br> 3. Conecte os cabos de sinal aos conectores. <br> 4. Conecte os cabos de alimentação às tomadas. <br> 5. LIGUE os dispositivos. | 1. DESLIGUE Tudo. <br> 2. Primeiramente, remova os cabos de alimentação das tomadas. <br> 3. Remova os cabos de sinal dos conectores. <br> 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 móídulo com uma bateria de lítio, substitua-o apenas pelo mesmo tipo de mídulo, 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 ítica, 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.
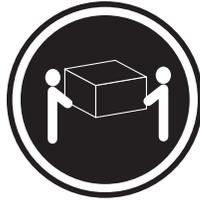


**PERIGO**

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 íticos, e evite exposição direta ao raio.
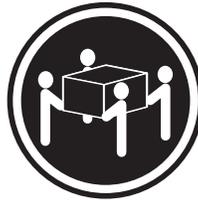
**Instrução 4**

≥18 kg (39.7 lb)     ≥32 kg (70.5 lb)     ≥55 kg (121.2 lb)
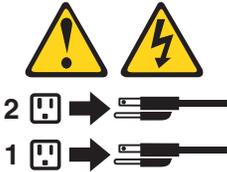
**CUIDADO:**

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.

**2**

**1**

**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 láminas 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。
>
> 将应与本产品连接的所有设备连接至正确布线的插座上。
>
> 尽量只使用单手拆接信号电缆。
>
> 有水、火及结构损坏迹象时，请勿打开任何设备。
>
> 除非在安装配置过程中有明确指示，否则，打开设备机盖前
> 应先断开与电源线、远程通信系统、网络和调制解调器的所
> 有连接。
>
> 安装、移动或打开本产品及其附带设备的机盖时，应按下表
> 所述连接和断开电缆。

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

声明 2



**警告:**

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

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

请勿对电池进行下列操作：
扔入或浸入水电　　　。
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拨下热插拨风扇电缆。

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，請勿開啟該設備的電源。
−在安裝及架構之時，若非非常熟悉，在開啟裝置蓋子之前，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，或開啟其蓋子時，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. 開啟裝置的電源。 | |

聲明 2



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

請勿將電池：
− 丟入或浸入水中
− 加熱超過 100 ℃ (212 ℉)
− 修理或拆開

請遵照當地法令規章處理廢棄電池。

聲明 3



注意：
安裝雷射產品 (如 CD-ROM、DVD 光碟機、光纖裝置或發射器) 時，請注意下列事項：
− 請勿移開蓋子。移開雷射產品的蓋子，您可能會暴露於危險的雷射輻射之下。裝置中沒有需要維修的組件。
− 不依此處所指示的控制、調整或處理步驟，您可能會暴露於危險的輻射之下。



危險

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

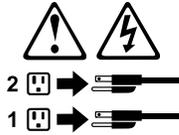開啟時會產生雷射輻射。請勿凝視光束，不要使用光學儀器直接觀察，且應避免直接暴露在光束下。

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會有危險之虞。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 |
|---|---|
| 1. Mettez les unités hors tension. <br> 2. Commencez par brancher tous les cordons sur les unités. <br> 3. Branchez les câbles d'interface sur des connecteurs. <br> 4. Branchez les cordons d'alimentation sur des prises. <br> 5. Mettez les unités sous tension. | 1. Mettez les unités hors tension. <br> 2. Débranchez les cordons d'alimentation des prises. <br> 3. Débranchez les câbles d'interface des connecteurs. <br> 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.**
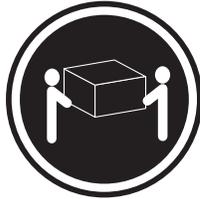
⚠️

**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.**
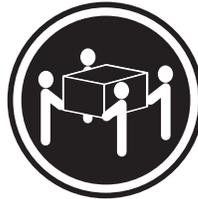
**Notice n° 4**



≥18 kg (39.7 lb)          ≥32 kg (70.5 lb)          ≥55 kg (121.2 lb)

**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 á 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 anschlie*β*en: | Kabel lösen: |
|---|---|
| 1. Alle Geräte ausschalten und Netzstecker ziehen. <br> 2. Zuerst alle Kabel an Einheiten anschließen. <br> 3. Signalkabel an Anschlußbuchsen anschließen. <br> 4. Netzstecker an Steckdose anschließen. <br> 5. Gerät einschalten. | 1. Alle Geräte ausschalten. <br> 2. Zuerst Netzstecker von Steckdose lösen. <br> 3. Signalkabel von Anschlußbuchsen lösen. <br> 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.
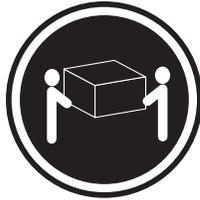


**VORSICHT**

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.
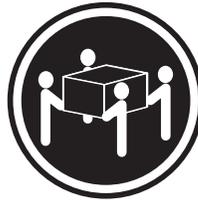
**Hinweis 4**



≥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: |
|---|---|
| 1. SPEGNERE tutti i dispositivi. | 1. SPEGNERE tutti i dispositivi. |
| 2. Collegare prima tutti i cavi alle unità. | 2. Rimuovere prima i cavi di alimentazione dalle prese elettriche. |
| 3. Collegare i cavi di segnale ai connettori. | 3. Rimuovere i cavi di segnale dai connettori. |
| 4. Collegare i cavi di alimentazione alle prese elettriche. | 4. Rimuovere tutti i cavi dalle unità. |
| 5. ACCENDERE le 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:

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

**Avviso 5**



**ATTENZIONE:**

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



**Avviso 10**

**ATTENZIONE:**

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



**Avviso 20**



**ATTENZIONE:**

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

**Avviso 21**



**ATTENZIONE:**

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

重要：

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で始まってる場合は、その注意の翻訳は、
記述１　の下にあります。

手順を実施する前に、すべての注意；

・記述　１

# ⚠ 危険

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

感電を防止するため ：

－電源コードは正しく接地および配線が行われている
　電源に接続してください。

－本製品が接続されるすべての装置もまた正しく配線
　された電源に接続されている必要があります。

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

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

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

・記述 2

## ⚠ 注意

本製品には、システム・ボード上にリチウム電池が使用され
ています。電池の交換方法や取り扱いを誤ると、発熱、
発火、破裂のおそれがあります。
電池の交換には、IBM部品番号33F8354の電池またはメーカー
推奨の同等の電池を使用してください。
交換用電池の購入については、お買い求めの販売店または
弊社の営業担当までお問い合わせください。
電池は幼児の手の届かない所に置いてください。
万一、幼児が電池を飲み込んだときは、直ちに医師に相談
してください。
以下の行為は絶対にしないでください。
－水にぬらすこと
－100度C 以上の過熱や焼却
－分解や充電
－ショート
電池を廃棄する場合、および保存する場合にはテープなど
で絶縁してください。他の金属や電池と混ざると発火、
破裂の原因となります。電池は地方自治体の条例、または
規則に従って廃棄してください。ごみ廃棄場で処分される
ごみの中に捨てないでください。

・記述 3

## ⚠ 注意

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

 – ここに記載されている制御方法、調整方法、または性能を超えて使用
   すると、危険な放射線を浴びる可能性があります。

 – ドライブのカバーを開けると、危険な放射線を浴びる可能性があります。
   ドライブの内部に修理のために交換可能な部品はありません。カバーを
   開けないでください。

## ⚠ 危険

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

CD-ROMドライブのカバーを開けるとレーザーが放射されます。
光線をみつめたり、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。

⚠ ⚡

2 ⊞ ➡ ▭▭
1 ⊞ ➡ ▭▭
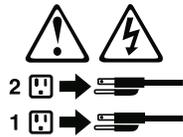
・記述 10

## ⚠ 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。

⚠(prohibited)

・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。
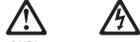ブレードを差し込む前に、ブレードのカバーは必ず取り付けておいてください。

**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 철수, 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.

- 가능한한 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.

다음을 주의하십시오.

- 던지거나 물에 담그지 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 클래서 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 있는 지 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 precauciín de esta IBM documentation empiezan con un número. Dicho número se emplea para establecer una referencia cruzada de una declaraciín de precauciín o peligro en inglés con las versiones traducidas que de dichas declaraciones pueden encontrarse en esta secciín.

Por ejemplo, si una declaraciín de peligro empieza con el número 1, las traducciones de esta declaraciín de precauciín aparecen en esta secciín bajo Declaraciín 1.

Lea atentamente todas las declaraciones de precauciín y peligro antes de llevar a cabo cualquier operaciín.

**Declaración 1**

**PELIGRO**

La corriente eléctrica de los cables telefínicos, de alimentaciín y de comunicaciones es perjudicial.

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

| Para la conexin | Para la desconexiín |
|---|---|
| 1. APÁGUELO todo.<br>2. En primer lugar, conecte los cables a los dispositivos.<br>3. Conecte los cables de señal a los conectores.<br>4. Conecte cada cable de alimentaciín a la toma de alimentaciín.<br>5. ENCIENDA el dispositivo. | 1. APÁGUELO todo.<br>2. En primer lugar, retire cada cable de alimentaciín de la toma de alimentaciín.<br>3. Retire los cables de señal de los conectores.<br>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 mídulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de mídulo, 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 legislaciín local.

**Declaración 3**



**PRECAUCIÓN:**

Cuando instale productos láser (como, por ejemplo, CD-ROM, unidades DVD, dispositivos de fibra íptica o transmisores), tenga en cuenta las advertencias siguientes:
- No retire las cubiertas. Si retira las cubiertas del producto láser, puede quedar expuesto a radiaciín láser perjudicial. Dentro del dispositivo no existe ninguna pieza que requiera mantenimiento.
- El uso de controles o ajustes o la realizaciín de procedimientos que no sean los que se han especificado aquí pueden dar como resultado una exposiciín perjudicial a las radiaciones.
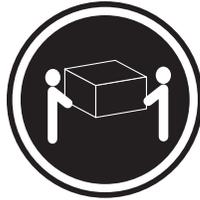


**PELIGRO**

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 radiaciín láser. No mire fijamente el rayo ni lleve a cabo ningún examen directamente con instrumentos ípticos; evite la exposiciín directa al rayo.

**Declaración 4**



≥18 kg        ≥32 kg        ≥55 kg

**PRECAUCIÓN:**

Tome medidas de seguridad al levantar el producto.

**Declaración 5**



**PRECAUCIÓN:**

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



**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 låminas 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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# Important notes

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

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

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

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

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

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## Product recycling and disposal

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

## Battery return program

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

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

In the Netherlands, the following applies.

# Electronic emission notices

## Federal Communications Commission (FCC) statement

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

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

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

## Industry Canada Class A emission compliance statement

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

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

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

## Australia and New Zealand Class A statement

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

## United Kingdom telecommunications safety requirement

**Notice to Customers**

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

## European Union EMC Directive conformance statement

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

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

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

## Taiwanese Class A warning statement

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

## Chinese Class A warning statement

声　　明
此为 A 级产品。在生活环境中，
该产品可能会造成无线电干扰。
在这种情况下，可能需要用户对其
干扰采取切实可行的措施。

## Japanese Voluntary Control Council for Interference (VCCI) statement

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

# Power cords

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

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

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

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

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

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

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

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

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