BladeCenter HS21 Type 1915 and 7995

IBM

Problem Determination and Service Guide

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IBM

Problem Determination and Service Guide

Note: Before using this information and the product it supports, read the general information in Appendix B, "Notices," on page 113, and the *Warranty and Support Information* document on the IBM *Documentation* CD.

Contents

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по
технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

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

Läs säkerhetsinformationen innan du installerar den här produkten.

Guidelines for trained service technicians

This section contains information for trained service technicians.

Inspecting for unsafe conditions

Use the information in this section to help you identify potential unsafe conditions in an IBM product on which you are working. Each IBM product, as it was designed and manufactured, has required safety items to protect users and service technicians from injury. The information in this section addresses only those items. Use good judgment to identify potential unsafe conditions that might be caused by non-IBM alterations or attachment of non-IBM features or options that are not addressed in this section. If you identify an unsafe condition, you must determine how serious the hazard is and whether you must correct the problem before you work on the product.

Consider the following conditions and the safety hazards that 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 a bulging capacitor.
- Mechanical hazards, such as loose or missing hardware.

To inspect the product for potential unsafe conditions, complete the following steps:
1. Make sure that the power is off and the power cord is disconnected.
2. Make sure that the exterior cover is not damaged, loose, or broken, and observe any sharp edges.
3. Check the power cord:
   - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
   - Make sure that the power cord is the correct type, as specified in the documentation for your BladeCenter unit type.
   - Make sure that the insulation is not 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 server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Make sure that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Guidelines for servicing electrical equipment

Observe the following guidelines when servicing electrical equipment:
- Check the area for electrical hazards such as moist floors, non-grounded power extension cords, and missing safety grounds.
- Use only approved tools and test equipment. Some hand tools have handles that are covered with a soft material that does not provide insulation from live electrical current.
- Regularly inspect and maintain your electrical hand tools for safe operational condition. Do not use worn or broken tools or testers.

- Do not touch the reflective surface of a dental mirror to a live electrical circuit. The surface is conductive and can cause personal injury or equipment damage if it touches a live electrical circuit.
- Some rubber floor mats contain small conductive fibers to decrease electrostatic discharge. Do not use this type of mat to protect yourself from electrical shock.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Locate the emergency power-off (EPO) switch, disconnecting switch, or electrical outlet so that you can turn off the power quickly in the event of an electrical accident.
- Disconnect all power before you perform a mechanical inspection, work near power supplies, or remove or install main units.
- Before you work on the equipment, disconnect the power cord. If you cannot disconnect the power cord, have the customer power-off the wall box that supplies power to the equipment and lock the wall box in the off position.
- Never assume that power has been disconnected from a circuit. Check it to make sure that it has been disconnected.
- If you have to work on equipment that has exposed electrical circuits, observe the following precautions:
  - Make sure that another person who is familiar with the power-off controls is near you and is available to turn off the power if necessary.
  - When you are working with powered-on electrical equipment, use only one hand. Keep the other hand in your pocket or behind your back to avoid creating a complete circuit that could cause an electrical shock.
  - When using a tester, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on a suitable rubber mat to insulate you from grounds such as metal floor strips and equipment frames.
- Use extreme care when measuring high voltages.
- To ensure proper grounding of components such as power supplies, pumps, blowers, fans, and motor generators, do not service these components outside of their normal operating locations.
- If an electrical accident occurs, use caution, turn off the power, and send another person to get medical aid.

Safety statements

Important:

Each caution and danger statement in this documentation begins with a number. This number is used to cross reference an English-language caution or danger statement with translated versions of the caution or danger statement in the *Safety Information* document.

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

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

Statement 1:

DANGER

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

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

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

Statement 2:

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

Do not:

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

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

Statement 3:

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

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

DANGER

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

Statement 4:

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

CAUTION:
Use safe practices when lifting.

Statement 5:

CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.
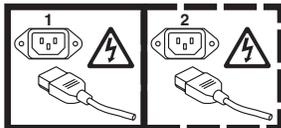
Statement 8:

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

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

Statement 10:

CAUTION:
Do not place any object on top of rack-mounted devices.

Statement 21:

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

Chapter 1. Introduction

This *Problem Determination and Service Guide* contains information to help you solve problems that might occur in your IBM® BladeCenter® HS21 Type 1915 and 7995 blade servers. It describes the diagnostic tools that come with the blade server, error codes and suggested actions, and instructions for replacing failing components.

Replaceable components are of four types:

- **Consumable part:** Purchase and replacement of consumable parts (components, such as batteries and printer cartridges, that have depletable life) is your responsibility. If IBM acquires or installs a consumable part at your request, you will be charged for the service.
- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

Related documentation

In addition to this document, the following documentation also comes with the server:

- *Installation and User's Guide*

  This document is in Portable Document Format (PDF) on the IBM *Documentation* CD. It contains general information about the server, including how to install supported options and how to configure the server.

- *Safety Information*

  This document is in PDF on the IBM *Documentation* CD. It contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* document.

- *Warranty and Support Information*

  This document is in PDF on the IBM *Documentation* CD. It contains information about the terms of the warranty and about service and assistance.

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

The blade server might have features that are not described in the documentation that comes with the server. The documentation might be updated occasionally to include information about those features, or technical updates might be available to provide additional information that is not included in the blade server documentation. The most recent versions of all BladeCenter documentation are at http://www.ibm.com/systems/support/. In addition to the documentation in this library, be sure to review the *IBM BladeCenter Planning and Installation Guide* for

your BladeCenter unit type for information to help you prepare for system installation and configuration. This document is available at http://www.ibm.com/systems/bladecenter/.

Notices and statements in this document

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

The following notices and statements are used in this document:

- **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 potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Features and specifications

The following table provides a summary of the features and specifications of the blade server.

Notes:

1. Power, cooling, removable-media drives, external ports, and advanced system management are provided by the BladeCenter unit.
2. The operating system in the blade server must provide USB support for the blade server to recognize and use the removable-media drives and front-panel USB ports. The BladeCenter unit uses USB for internal communications with these devices.

Microprocessor: Supports up to two Intel Xeon microprocessors
Note: Use the Configuration/Setup Utility program to determine the type and speed of the microprocessors in your blade server.
 	
Memory:
• Dual-channel DIMMs: 8 DIMM slots
• Type: fully-buffered double-data rate (FB-DDR2), PC2-5300, ECC SDRAM registered x4 (Chipkill) DIMMs
• Supports 512 MB, 1 GB, 2 GB, and 4 GB DIMMs (as of the date of this publication) with up to 32 GB of total memory in the system board
 	
Drives: Support for up to one internal small-form-factor Serial Attached SCSI (SAS) drive
 	
Predictive Failure Analysis (PFA) alerts:
• Microprocessor
• Memory
• Hard disk drive
 	
Electrical input: 12 V dc
	Integrated functions:
	• Dual Gigabit Ethernet controllers
	• Expansion card interface
	• Local service processor: Baseboard management controller (BMC) with Intelligent Platform Management Interface (IPMI) firmware
	• ATI RN50 ES1000 video controller
	• LSI 1064E Serial Attached SCSI (SAS) controller
	• Light path diagnostics
	• RS-485 interface for communication with the management module
	• Automatic server restart (ASR)
	• Serial over LAN (SOL)
	• Redundant buses for communication with keyboard, mouse, and removable media drives
	• Concurrent keyboard/video/mouse (cKVM) support when optional cKVM feature card is installed.
	
	Environment (non-NEBS):
	• Air temperature:
	  – Blade server on: 10° to 35° C (50° to 95° F). Altitude: 0 to 914 m (0 to 3000 ft)
	  – Blade server on: 10° to 32° C (50° to 90° F). Altitude: 914 to 2133 m (3000 to 7000 ft)
	  – Blade server off: -40° to 60° C (-40° to 140° F)
	• Humidity:
	  – Blade server on: 8% to 80%
	  – Blade server off: 5% to 80%
		Environment (NEBS):
		• Air temperature:
		  – Blade server on: 5° to 40°C (41° to 104°F). Altitude: -60 to 1800 m (-197 to 5905 ft)
		  – Blade server on (short term): -5° to 55°C (23° to 131°F). Altitude: -60 to 1800 m (-197 to 5905 ft)
		  – Blade server on: 5° to 30°C (41° to 86°F). Altitude: 1800 to 4000 m (5905 to 13123 ft)
		  – Blade server on (short term): -5° to 45°C (23° to 113°F). Altitude: 1800 to 4000 m (5905 to 13123 ft)
		  – Blade server off: -40° to 60°C (-40° to 140°F)
		• Humidity:
		  – Blade server on: 8% to 85%
		  – 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 year, but no more than 15 occurrences during that 1-year period.)
		
		Size:
		• Height: 24.5 cm (9.7 inches)
		• Depth: 44.6 cm (17.6 inches)
		• Width: 2.9 cm (1.14 inches)
		• Maximum weight: 5.4 kg (12 lb.)

Blade server controls and LEDs

This section describes the controls and LEDs on the blade server.

Note: The control panel door is shown in the closed (normal) position in the following illustration. To access the power-control button, you must open the control panel door.
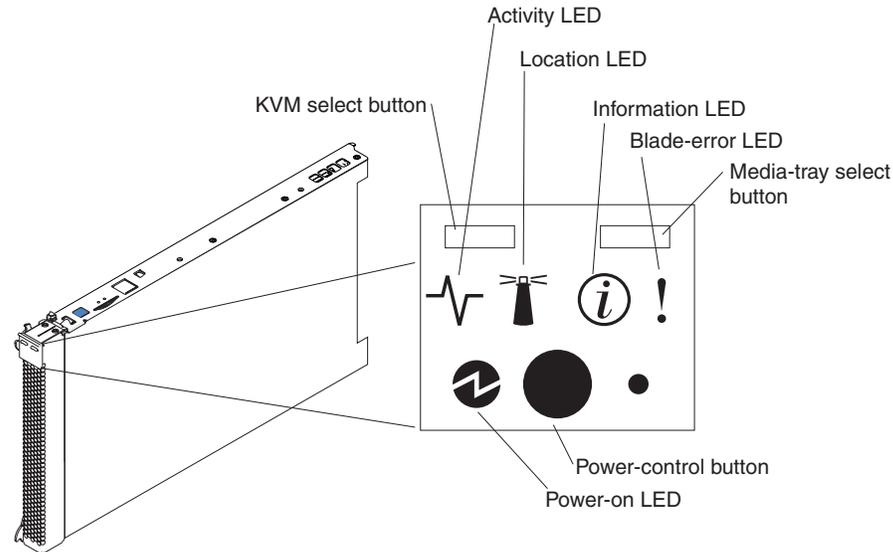
Keyboard/video/mouse (KVM) select button: Press this button to associate the shared BladeCenter unit keyboard port, video port, and mouse port with the blade server. The LED on this button flashes while the request is being processed, and then is lit when the ownership of the keyboard, video, and mouse has been transferred to the blade server. It can take approximately 20 seconds to switch the keyboard, video, and mouse control to the blade server.

Using a keyboard that is directly attached to the management-module, you can press keyboard keys in the following sequence to switch KVM control between blade servers instead of using the KVM select button:

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 there is no response when you press the KVM select button, you can use the management-module Web interface to determine whether local control has been disabled on the blade server.

Notes:
1. The operating system in the blade server must provide USB support for the blade server to recognize and use the keyboard and mouse, even if the keyboard and mouse have PS/2-style connectors.
2. If you install a supported Microsoft Windows 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 that you switch the keyboard, video, and mouse to the blade server. All subsequent switching takes place in the normal KVM switching time frame (up to 20 seconds).

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

Location LED: When this blue LED is lit, it has been turned on by the system administrator to aid in visually locating the blade server. The location LED on the BladeCenter unit is lit also. The location LED can be turned off through the management-module Web interface or through IBM Director Console.

Information LED: When this amber LED is lit, it indicates that information about a system error for the blade server has been placed in the management-module event log. The information LED can be turned off through the management-module Web interface or through 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.

Media-tray select button: Press this button to associate the shared BladeCenter unit media tray (removable-media drives and front-panel USB ports) with the blade server. The LED on the button flashes while the request is being processed, and then is lit when the ownership of the media tray has been transferred to the blade server. It can take approximately 20 seconds for the operating system in the blade server to recognize the media tray.

If there is no response when you press the media-tray select button, you can use the management-module Web interface to determine whether local control has been disabled on the blade server.

Note: The operating system in the blade server must provide USB support for the blade server to recognize and use the removable-media drives and front-panel USB ports.

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

Note: The power-control button has effect only if local power control is enabled for the blade server. Local power control is enabled and disabled through the 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 (BMC) firmware is being flashed
  - The management module is not giving the BMC power-on permissions
  - The management module is in the process of trying to identify the slot
- Flashing slowly: The blade server has power permissions but is not turned on.
- Lit continuously: The blade server has power permissions and is turned on.

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:

- You can press the power-control button on the front of the blade server (behind the control panel door, see "Blade server controls and LEDs" on page 5) to start the blade server.

  Notes:
  1. Wait until the power-on LED on the blade server flashes slowly before pressing the power-control button. While the service processor in the management module is initializing, the power-on LED does not flash, and the power-control button on the blade server does not respond.
  2. While the blade server is starting, the power-on LED on the front of the blade server is lit. See "Blade server controls and LEDs" on page 5 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 management module to do so.
- You can turn on the blade server remotely by using the management module.
- If the blade server is connected to power (the power-on LED is flashing slowly), the operating system supports the Wake on LAN feature, and the Wake on LAN feature has not been disabled through the management module, the Wake on LAN feature can turn on the blade server.

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

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

- You can press the power-control button on the blade server (behind the control panel door, see "Blade server controls and LEDs" on page 5). This starts an orderly shutdown of the operating system, if this feature is supported by the operating system.

  Note: After you turn 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.
  - If the system is not operating correctly, the management module will automatically turn off the blade server.
  - Through the management-module Web interface, you can also configure the management module to turn off the blade server. For additional information, see the *IBM BladeCenter Management Module User's Guide*.

System board layouts

The following illustrations show the connectors, LEDs, switches, and jumpers on the system board. The illustrations in this document might differ slightly from your hardware.

System board connectors

The following illustration shows the connectors and LEDs for the system-board.
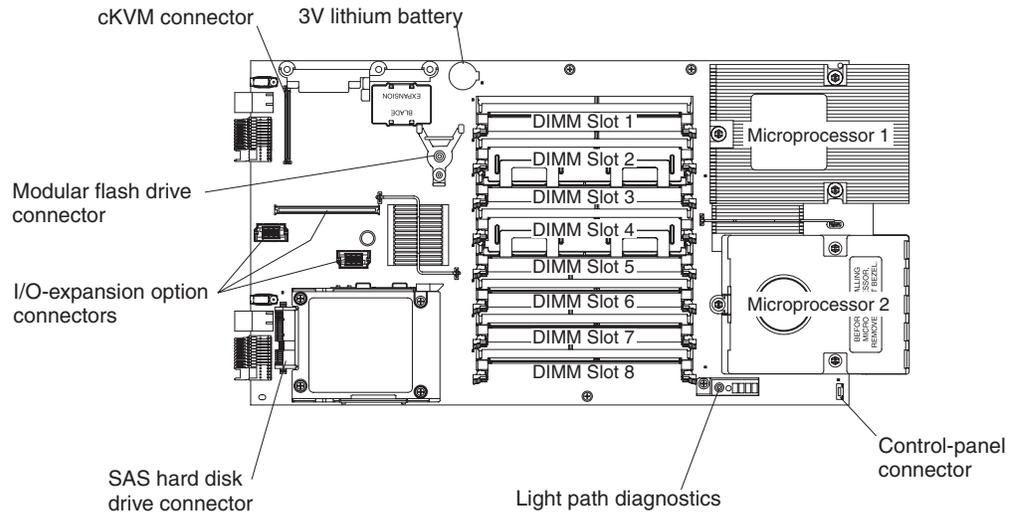
System board switches

The following illustration shows the location of the switch block (SW3), the light path diagnostics switch (SW4), and the reset switch (SW5) on the system board.
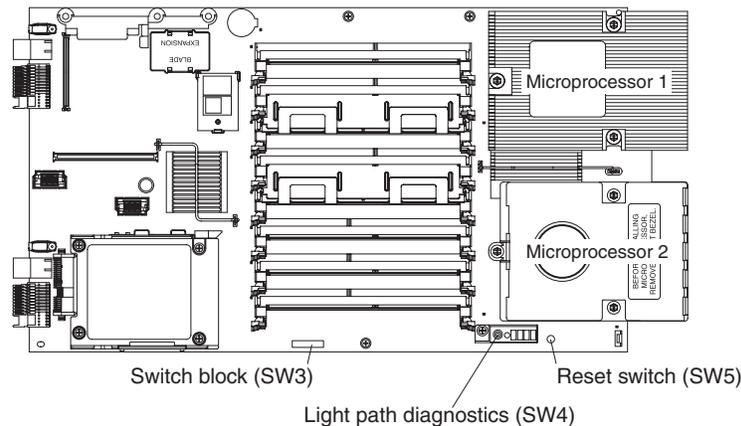
The following table defines the function of each switch in the switch block (SW3).

Switch number	Description

SW3	Switch block 3 has eight switches:
	• 1 - BIOS backup page
	  – Off: the BIOS starts from the primary BIOS page.
	  – On: the BIOS starts from the backup BIOS page.
	• 2 - Force power on switch
	  – Off: Require BMC permission to power up. (default)
	  – On: Bypass BMC permission to power up.
	• 3 - Wake On LAN disable
	  – Off: Enabled (default)
	  – On: Disabled
	• 4 - Reserved
	• 5 - Reserved
	• 6 - Real-Time Clock (RTC) reset
	  – Off: Normal (default)
	  – On: Reset RTC
	• 7 - Reserved
	• 8 - Bypass power-on password during next server start
	  – Off: Disabled (default)
	  – On: Enabled

SW5	Press this switch to reset the blade server.

System board LEDs

The following illustration shows the LEDs on the system board. You must remove the blade server from the BladeCenter unit, open the cover or remove any optional expansion units, and press the light path diagnostics switch to light any error LEDs that were turned on during processing. Diagnosing problems using the light path LEDs is described in"Light path diagnostics" on page 91.
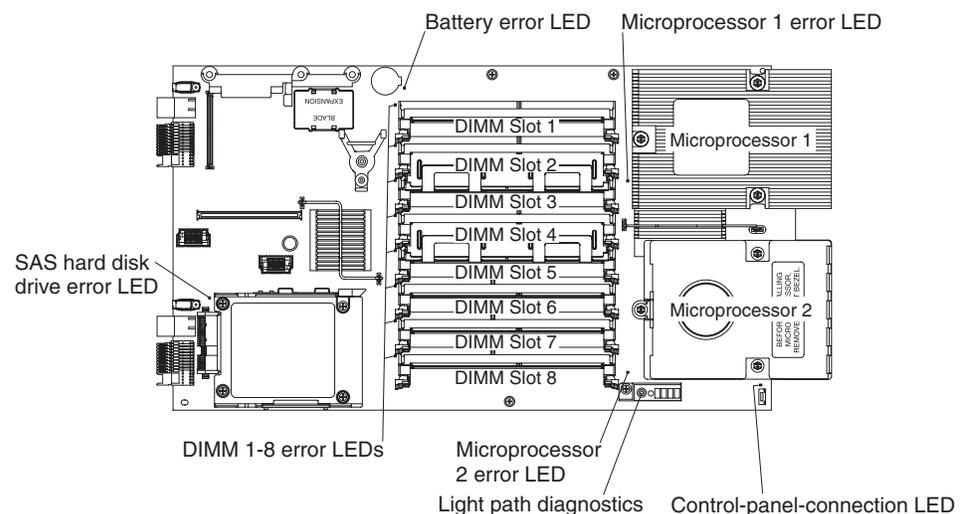
The following illustration shows the light path diagnostics panel on the system board.

NMI —————— NMI error LED

MIS —————— Microprocessor mismatch error LED

S BRD —————— System-board error LED

TEMP —————— Over temperature error LED

LP 1 —————— Light path diagnostics LED

◯ —————— Light path diagnostics switch
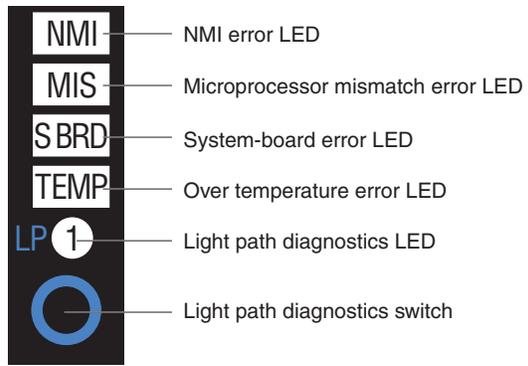
Chapter 2. Configuration information and instructions

This chapter provides information about updating the firmware and using the configuration utilities.

Firmware updates

IBM periodically makes BIOS, service processor (BMC), and diagnostic firmware updates available for the blade server. Go to http://www.ibm.com/systems/support/ to download the latest firmware for the blade server. Install any updates, using the instructions that are included with the downloaded file.

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

Using the Configuration/Setup Utility program

The Configuration/Setup Utility program is part of the BIOS. You can use it to:
* Change interrupt request (IRQ) settings
* Change the startup drive sequence
* Configure serial-port assignments
* Enable USB keyboard and mouse support
* Resolve configuration conflicts
* Set the date and time
* Set passwords and security settings

To start the Configuration/Setup Utility program, complete the following steps:
1. Turn on the server.
2. When the message `Press F1 for Configuration/Setup` appears, press F1. If an administrator password has been set, you must type the administrator password to access the full Configuration/Setup Utility menu.
3. Follow the instructions on the screen.

Configuring the Gigabit Ethernet controllers

Two Ethernet controllers are integrated on the blade server system board. Each controller provides a 1-Gbps full-duplex interface for connecting to one of the Ethernet-compatible 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 module in I/O-module bay 1 or bay 2. See "Blade server Ethernet controller enumeration" on page 12 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 the BladeCenter HS21 Type 1915 and 7995 blade servers might have different Ethernet controller routing. See the documentation that comes with the other blade servers for information.

You do not have 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 the Ethernet controllers, see the *Broadcom NetXtreme Gigabit Ethernet Software* CD that comes with the blade server. To find updated information about configuring the controllers, see http://www.ibm.com/systems/support/.

The Ethernet controllers support failover, which provides automatic redundancy for the Ethernet controllers. Without failover, you can have only 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. Either 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, the secondary controller takes over. When the primary link is restored, the Ethernet traffic switches back to the primary Ethernet controller. See your operating system device driver documentation for information about configuring for failover.

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

Blade server Ethernet controller enumeration

The enumeration of the Ethernet controllers in a blade server is operating-system dependent. Through the operating-system settings, you can verify the Ethernet controller designations that a blade server uses.

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 (**I/O Module Tasks → Management → Advanced Management** in the management-module Web 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 that the switch module is connected to. 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 expansion card in a blade server, communication from the expansion card is routed to I/O-module bays 3 and 4, if these bays are supported by your BladeCenter unit. You can verify which controller on the card is routed to which I/O-module bay by performing the same test and using a controller on the expansion card and a compatible switch module or pass-thru module in I/O-module bay 3 or 4.

Configuring a SAS RAID

Note: Configuring a SAS redundant array of independent disks (RAID) array applies only to a blade server in which two or more SAS hard disk drives are installed.

If an optional BladeCenter Storage Expansion Unit 3 is installed, you can use it to control the SAS hard disk drive installed in the blade server. You can enable this feature using the Configuration/Setup Utility program (see the *Installation and User's Guide* for information and instructions).

Important: You must create the RAID array *before* you install the operating system on the blade server.

You can use the LSI Logic Configuration Utility program to configure the SAS hard disk drives and SAS controller. To start the LSI Logic Configuration Utility, complete the following steps:

1. Turn on the blade server (make sure that the blade server is the owner of the keyboard, video, and mouse) and watch the monitor screen.
2. When the message

   ```
   Press Ctrl-C to start LSI Logic Configuration Utility
   ```

   appears, press Ctrl-C. If an administrator password has been set, you must type the administrator password to access the full LSI Logic Configuration Utility menu.
3. Follow the instructions on the screen to modify the SAS hard disk drive and SAS controller settings.

Chapter 3. Parts listing, Type 1915 and 7995

The following replaceable components are available for the IBM BladeCenter HS21 Type 1915 and 7995 blade servers, models L1x, L2x, L3x, L4x, L5x, L6x, NTx, H1x, C1x, C2x, and J1x.

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

Replaceable components are of four types:

- **Consumable part:** Purchase and replacement of consumable parts (components, such as batteries and printer cartridges, that have depletable life) is your responsibility. If IBM acquires or installs a consumable part at your request, you will be charged for the service.
- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

Index	Description	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
1	Cover	42D8680		
2	Memory, 512 MB FBD PC2-5300 (all models except E2x, E5x, EHx, GNx, HVx)	39M5781		
2	Memory, 1 GB FBD PC2-5300 (option)	39M5784		
2	Memory, 1 GB DDR2-667 (option)	46C7421		
2	Memory, 2 GB FBD PC2-5300 (models E2x, E5x, EHx, GNx HVx)	39M5790		
2	Memory, 2 GB DDR2-667 (option)	46C7422		
2	Memory, 4 GB FBD PC2-5300 (option)	41Y2845		
2	Memory, 4 GB PC2–5300 (option)	44E4402		
2	Memory, 4 GB DDR2-667 (option)	46C7423		
3	Card, 4 GB flash memory (model HVx)	46C5079		
3	Card, 4 GB flash memory (option)	46C5079		
3	Card, 8 GB flash memory (option)	43W3932		
4	Heat sink, microprocessor (all models except E2x, E5x, EHx, G1x, G3x, G4x, G5x, G6x, G7x, GLx, GNx, HVx, R2x, RLx)			42C0584
4	Heat sink, microprocessor (models EHx, G1x, G3x, G4x, G5x, G6x, G7x, GLx GNx, HVx, R2x, RLx)			43W4014
5	DIMM baffle	40K5974		
6	Microprocessor 1.60 GHz, 65W (model L1x)			42C0573
6	Microprocessor 1.86 GHz, 65W (model L2x)			42C0574
6	Microprocessor 2.00 GHz, 65W (model L3x)			42C0575
6	Microprocessor 2.00 GHz, 80W (model G1x)			43W4000
6	Microprocessor 2.33 GHz, 65W (model L4x)			42C0576
6	Microprocessor 2.66 GHz, 65W (models E5x, L5x)			42C0577
6	Microprocessor 2.13 GHz, 35W (model NTx)			42C0579
6	Microprocessor 2.13 GHz, 40W (model GNx)			46C5095
6	Microprocessor 2.33 GHz, 40W (model H1x)			42C0580
6	Microprocessor 2.33 GHz, 80W (models C2x, E2x)			42C0581
6	Microprocessor 2.50 GHz, 80W (model G3x)			43W4002
6	Microprocessor 2.50 GHz, 50W (model GLx)			46C5054
6	Microprocessor 2.66 GHz, 80W (model G4x)			43W4003
6	Microprocessor 2.83 GHz, 80W (model G5x)			43W4004
6	Microprocessor 1.60 GHz, 50W (model J1x)			42C0582
6	Microprocessor 1.86 GHz, 80W (model C1x)			42C0583
6	Microprocessor 1.86 GHz, 50W (model J2x)			43W3923
6	Microprocessor 2.00 GHz, 50W (model J3x)			43W3950
6	Microprocessor 2.66 GHz, 50W (option)			46C5115
6	Microprocessor 2.00 GHz, 80W (model A2x)			43X1013
6	Microprocessor 1.60/ GHz, 80W (model A1x)			43X1012
6	Microprocessor 3.00 GHz, 40W (model RLx)			46C5055

Index	Description	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
6	Microprocessor 3.00 GHz, 80W (model L6x)			42C0578
6	Microprocessor 3.00 GHz, 80W (models EHx, G6x, HVx)			43W4005
6	Microprocessor 3.16 GHz, 120W (model G7x)			43W4006
6	Microprocessor 3.33 GHz, 80W (model R2x)			43W4034
7	Front bezel	42C0594		
8	Filler, microprocessor heat sink (all models E2x E5x EHx, HVx)	40K5977		
9	System board assembly (all models except EHx, EVx, G1x, G2x, G3x, G4x, G5x, G6x, G7x, GLx, GNx, HVx, R1x, R2x, RLx)			43W4021
9	System board assembly (models EHx, EHx, G1x, G2x, G3x, G4x, G5x, G6x, G7x, GLx, GNx, HVx, R1x, R2x, RLx)			46C5099
10	Hard disk drive, 36.4 GB 10K SAS (option)	26K5778		
10	Hard disk drive, 73.4 GB 10K SAS (option)	26K5779		
10	Hard disk drive, 146.8 GB SAS (option)	42D0422		
10	Hard disk drive, 73 GB 15K SAS (option)	43X0847		
	15.8 GB 2.5 inch solid state drive (option)		43W7617	
	15.8 GB 2.5 inch solid state drive (option)		43W7621	
	Alcohol Wipe (models G, U)	41Y8746		
	Alcohol Wipe (model G)	41Y8747		
	Alcohol Wipe (models E, J, VI)	41Y8748		
	Alcohol Wipe (model A)	41Y8749		
	Alcohol Wipe (models G, M)	41Y8750		
	Alcohol Wipe (models K, R)	41Y8751		
	Alcohol Wipe (all models)	41Y8752		
	Alcohol Wipe (model G)	41Y8753		
	Alcohol Wipe (model A)	41Y8754		
	Alcohol Wipe (models C, D, N)	41Y8757		
	Alcohol Wipe (model B)	41Y8758		
	Alcohol Wipe (model Q, I)	41Y8759		
	Alcohol Wipe (model A)	41Y8760		
	Blade storage expansion unit (option)	40K1739		
	Boot flash tray			42C0593
	Dual 15.8 GB 2.5 inch solid state drive (option)		43W7609	
	Dual interposer card, dual SATA to SAS (option)		39M4583	
	Dual carrier (option)		40K6883	
	Ethernet 4 port 1 GB expansion card (option)	44W4488		
	Expansion card, small-form-factor IBM Gigabit Ethernet (option)	39M4630		
	Expansion card, Infiniband 4x high-speed card (option)	32R1763		
	Expansion card, cKVM card (option)	13N0842		
	Expansion card, Myrinet (option)	32R1845		

Index	Description	CRU No. (Tier 1)	CRU No. (Tier 2)	FRU No.
	Kit, miscellaneous parts, contains: • Connector, protective cover (2) • Pin, alignment (2) • Screw, 3.5x5 (20) • Screw, M3x6 (6) • Socket, alignment (2) • Support, pin (4) • Support, stud (2) • Tray, SFF bracket (2) • Tray, CFF bracket (2)	32R2451		
	Kit, miscellaneous parts, contains: • Bracket, retention (1) • Pin, alignment (2) • Socket, alignment (2) • Support, pin (4) • Support, battery (1) • Screw, 3.5x5 (20) • Screw, M3x6 (6) • Support, stud (2) • Tray assembly, blade storage expansion unit (1) • Tray, CFF bracket (2) • Tray, SFF bracket (2) • Tray, front card (1)	41Y5301		
	Label, blade storage expansion unit (option)	41Y5300		
	Label, FRU list (all models except EHx, G1x, G3x, G4x, G5x, G6x, G7x, GLx, GNx, HVx, R2x, RLx)	44X2240		
	Label, FRU list (models EHx, G1x, G3x, G4x, G5x, G6x, G7x, GLx, GNx, HVx, R2x, RLx)	43W4020		
	Label, system service	43W4019		
	Meteor SAS connectivity card (option)	43W3975		
	PCI I/O expansion unit 3e (option)	43W4390		
	Tray, SAS hard disk drive with lever release	31R2239		

Consumable parts are not covered by the IBM Statement of Limited Warranty. The following consumable parts are available for purchase from the retail store.

Table 1. Consumable parts

Description	Part number
Battery, 3.0 volt	33F8354

Recovery CDs

Recovery CD	CRU No.
Microsoft Windows Server Standard Edition 2003 R2 w/SP2 32Bit 1-4 CPUs - English - EN	44W4046

Recovery CD	CRU No.
Microsoft Windows Server Standard Edition 2003 R2 w/SP2 32Bit 1-4 CPUs - French - FR	44W4047
Microsoft Windows Server Standard Edition 2003 R2 w/SP2 32Bit 1-4 CPUs - Italian - IT	44W4048
Microsoft Windows Server Standard Edition 2003 R2 w/SP2 32Bit 1-4 CPUs - German - GE	44W4049
Microsoft Windows Server Standard Edition 2003 R2 w/SP2 32Bit 1-4 CPUs - Spanish - SP	44W4050
Microsoft Windows Server Standard Edition 2003 R2 w/SP2 32Bit 1-4 CPUs - Traditional Chinese - CT	44W4051
Microsoft Windows Server Standard Edition 2003 R2 w/SP2 32Bit 1-4 CPUs - Japanese - JP	44W4052
Microsoft Windows Server Standard Edition 2003 R2 w/SP2 32Bit 1-4 CPUs - Simplified Chinese - CS	44W4053
Microsoft Windows Server Standard Edition 2003 R2 w/SP2 32Bit 1-4 CPUs - Korean - KR	44W4054
Microsoft Windows Server Standard Edition 2003 R2 w/SP2 64Bit 1-4 CPUs - English - EN	44W4055
Microsoft Windows Server Standard Edition 2003 R2 w/SP2 64Bit 1-4 CPUs - Japanese - JP	44W4056
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-2 CPUs - English - EN	44W4057
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-2 CPUs - French - FR	44W4058
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-2 CPUs - German - GE	44W4059
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-2 CPUs - Spanish - SP	44W4060
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-2 CPUs - Simplified Chinese - CS	44W4061
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-2 CPUs - Traditional Chinese - C	44W4062
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-2 CPUs - Japanese - JP	44W4063
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-2 CPUs - Korean - KR	44W4064
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-2 CPUs - Italian - IT	44W4078
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-8 CPUs - English - EN	44W4065
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-8 CPUs - French - FR	44W4066
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-8 CPUs - Italian - IT	44W4067
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-8 CPUs - German - GE	44W4068
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-8 CPUs - Spanish - SP	44W4069
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-8 CPUs - Simplified Chinese - CS	44W4070
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-8 CPUs - Traditional Chinese - CT	44W4071
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-8 CPUs - Japanese - JP	44W4072
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 32Bit 1-8 CPUs - Korean - KR	44W4073

Recovery CD	CRU No.
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 64Bit 1-2 CPUs - English - EN	44W4074
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 64Bit 1-2 CPUs - Japanese - JP	44W4075
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 64Bit 1-8 CPUs - English - EN	44W4076
Microsoft Windows Server Enterprise Edition 2003 R2 w/SP2 64Bit 1-8 CPUs - Japanese - JP	44W4077
VMware ESX Server 3i Recovery Tools CDs	46D0762
VMware ESX Server 3i Recovery Tools Update 2 CDs	46M9236
VMware ESX Server 3i version 3.5 Update 3	46M9237
VMware ESX Server 3i version 3.5 Update 4	46M9238
Datacenter WinServer 2008 32/64 Bit - Multilingual	49Y0222
Datacenter WinServer 2008 32/64 Bit - Simplified Chinese - CS	49Y0223
Datacenter WinServer 2008 32/64 Bit - Traditional Chinese	49Y0224
Windows Server 2008 Standard Edition 32/64 Bit (1-4 Processor) Multilingual	49Y0892
Windows Server 2008 Standard Edition 32/64 Bit (1-4 Processor) Simplified Chinese - CS	49Y0893
Windows Server 2008 Standard Edition 32/64 Bit (1-4 Processor) Traditional Chinese - CT	49Y0894
Windows Server 2008 Enterprise Edition 32/64 Bit (1-8 Processor) Multilingual	49Y0895
Windows Server 2008 SP2 Enterprise 32/64 Bit (1-8 Processor) Simplified Chinese - CS	49Y0896
Windows Server 2008 Enterprise Edition 32/64 Bit (1-8 Processor) Traditional Chinese - CT	49Y0897
WMware ESXi 4	49Y8747
Windows HPC Server 2008 (1-4 Processors) English - EN	68Y9455
Windows HPC Server 2008 (1-4 Processors) Japanese- JP	68Y9456
Windows HPC Server 2008 (1-4 Processors) Simplified Chinese - CS	68Y9457
Windows 2003 Enterprise 32 Embedded Software Package	68Y9467

Chapter 4. Removing and replacing blade server components

Replaceable components are of four types:

- **Consumable part:** Purchase and replacement of consumable parts (components, such as batteries and printer cartridges, that have depletable life) is your responsibility. If IBM acquires or installs a consumable part at your request, you will be charged for the service.
- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine whether a component is a Tier 1 CRU, Tier 2 CRU, or FRU.

For information about the terms of the warranty and getting service and assistance, see the *Warranty and Support Information* document.

Installation guidelines

Before you remove or replace a component, read the following information:

- Read the safety information that begins on page vii and the guidelines in "Handling static-sensitive devices" on page 22. This information will help you work safely.
- When you install your new blade server, take the opportunity to download and apply the most recent firmware updates. This step will help to ensure that any known issues are addressed and that your blade server is ready to function at maximum levels of performance.

  To download firmware updates for your blade server, complete the following steps.

  Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

  1. Go to http://www.ibm.com/systems/support/.
  2. Under **Product support**, click **BladeCenter**.
  3. Under **Popular links**, click **Software and device drivers**.
  4. Click **BladeCenter HS21 XM (7995)** to display the matrix of downloadable files for the blade server.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- Back up all important data before you make changes to disk drives.
- Before you remove a 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 blade 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 the blade server, see http://www.ibm.com/servers/eserver/serverproven/compat/us/.

System reliability guidelines

To help ensure proper cooling and system reliability, make sure that the following requirements are met:

- Each microprocessor socket always contains either a microprocessor heat-sink filler or a microprocessor and heat sink. If the blade server has only one microprocessor, it must be installed in microprocessor socket 1.
- You do not operate the BladeCenter unit without a blade server, expansion unit, or filler blade installed in each blade bay to ensure proper cooling. See the documentation for your BladeCenter unit for additional information.
- The blade server battery must be operational. If the battery becomes defective, replace it immediately.

Handling static-sensitive devices

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

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

- When you work on a BladeCenter unit that has an electrostatic discharge (ESD) connector, use a wrist strap when you handle modules, optional devices, or blade servers. To work correctly, 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 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 circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in the 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 the package and install it directly into the blade server without setting down the device. If it is necessary to set down the device, put it back into the static-protective package. Do not place the device on the blade server cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Returning a device or component

If you are instructed to return a device or component, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Removing the blade server from a BladeCenter unit

Attention:

- To maintain proper system cooling, do not operate the BladeCenter unit without a blade server, expansion unit, or blade filler installed in each blade bay.
- Note the bay number. Reinstalling a blade server into a different bay than the one from which it was removed could have unintended consequences. Some configuration information and update options are established according to bay number; if you reinstall the blade server into a different bay, you might have to reconfigure the blade server.

To remove the blade server from a BladeCenter unit, complete the following steps. The appearance of your BladeCenter unit might be different, see the documentation for your BladeCenter unit for additional information.

Release handles
(open)
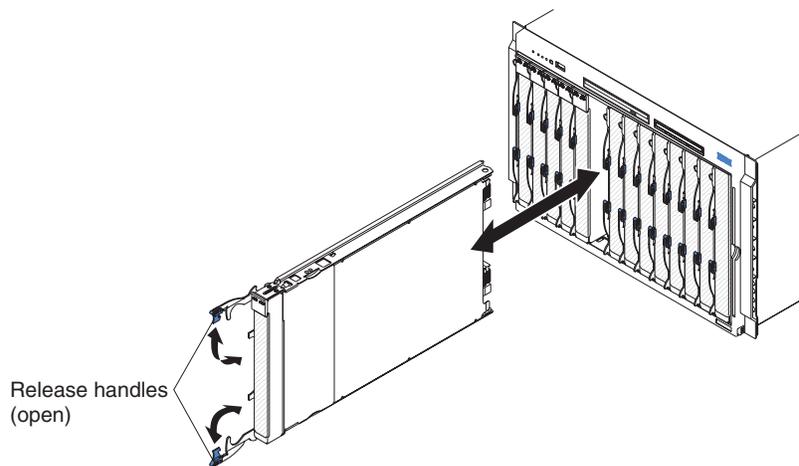
1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.
2. (BladeCenter T unit only) Remove the bezel assembly on the BladeCenter T unit. For detailed instructions for removing the bezel assembly, see the *Installation and User's Guide* that comes with the BladeCenter T unit.
3. 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 "Turning off the blade server" on page 7 for more information).

   Attention: Wait at least 30 seconds, until the hard disk drives stop spinning, before proceeding to the next step.
4. Pull the two release handles to the open position as shown in the illustration. The blade server moves out of the bay approximately 0.6 cm (0.25 inch).
5. Pull the blade server out of the bay.
6. Place either a blade filler or another blade server in the bay within 1 minute.

Installing the blade server in a BladeCenter unit

To install a blade server in a BladeCenter unit, complete the following steps. The appearance of your BladeCenter unit might be different, see the documentation for your BladeCenter unit for additional information.

Release handles (open)
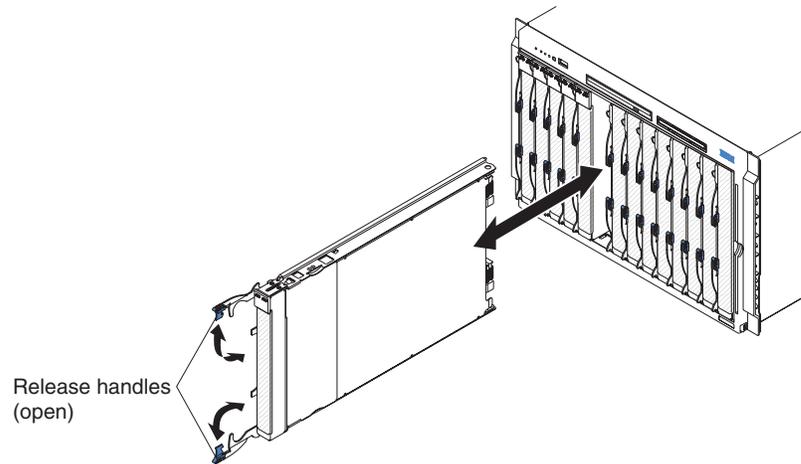
Statement 21:

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.

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.

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

3. If you installed a blade filler or another blade server in the bay from which you removed the blade server, remove it from the bay.

   Attention: You must install the blade server in the same blade bay from which you removed it. Some blade server configuration information and update options are established according to bay number. Reinstalling a blade server into a different blade bay from the one from which it was removed could have unintended consequences, and you might have to reconfigure the blade server.

4. Slide the blade server into the blade bay from which you removed it until it stops.

5. Push the release handles on the front of the blade server closed.

6. Turn on the blade server (see "Turning on the blade server" on page 7 for instructions).

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

8. (Optional) Write identifying information on one of the labels that come with the blade servers and place the label on the BladeCenter unit bezel. See the documentation for your BladeCenter unit for information about the label placement.

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

9. (BladeCenter T unit only) Reinstall the bezel assembly on the BladeCenter T unit. For detailed instructions for reinstalling the bezel assembly, see the *Installation and User's Guide* that comes with the BladeCenter T unit.

If you have changed the configuration of the blade server or if you are installing a different blade server from the one that you removed, you must configure the blade server through the Configuration/Setup Utility, and you might have to install the blade server operating system. Detailed information about these tasks is available in the *Installation and User's Guide*.

Removing and replacing Tier 1 CRUs

Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

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

Removing the blade server cover

To remove the blade server cover, complete the following steps.
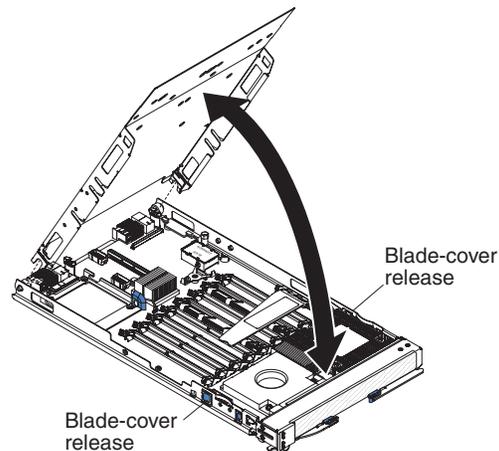
Blade-cover release

Blade-cover release

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24 for instructions).
3. Carefully lay the blade server down on a flat, static-protective surface, with the cover side up.
4. Press the blade-cover release on each side of the blade server or expansion unit and lift the cover open, as shown in the illustration.
5. Lift the cover from the blade server and store it for future use.

Installing the blade server cover

To install the blade server cover, complete the following steps.

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.

Blade-cover release

Blade-cover release
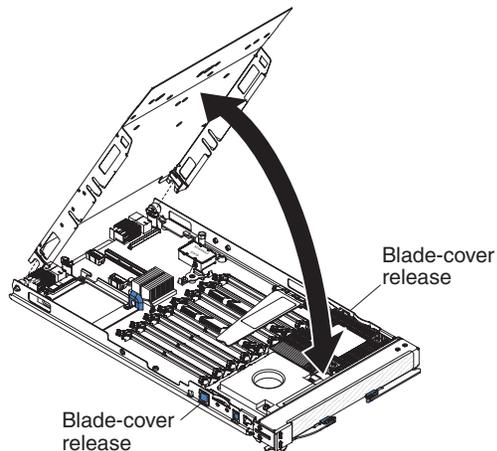
Attention: You cannot insert the blade server into the BladeCenter unit until the cover is installed and closed. Do not attempt to override this protection.

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.

2. Lower the cover so that the slots at the rear slide down onto the pins at the rear of the blade server. 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.

3. Pivot the cover to the closed position until it clicks into place.

4. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25 for instructions).

Removing an expansion unit

To remove the expansion unit, complete the following steps.

Expansion unit

Blade-cover
release

Blade-cover
release
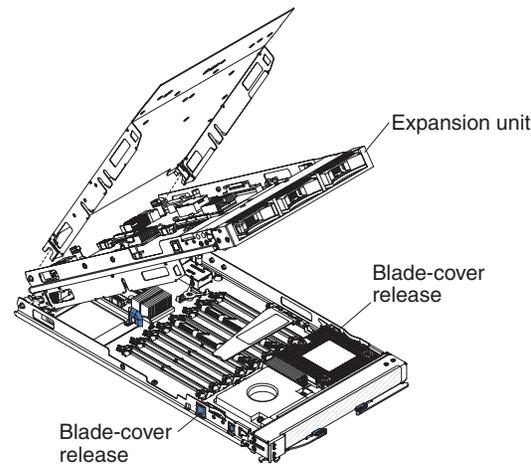
1. Read the safety information beginning on page vii and "Installation guidelines" on page 21.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24 for instructions).
3. Carefully lay the blade server down on a flat, static-protective surface, with the cover side up.
4. Remove the blade server cover, if one is installed (see "Removing the blade server cover" on page 27 for instructions).
5. Remove the expansion unit:

    a. Press the blade-cover release on each side of the blade server.

    b. Use the extraction device on the expansion unit, if one is present, to disengage the expansion unit from the system board. These extraction devices can be of several types, including thumb screws or levers.

    c. Rotate the expansion unit open; then, lift the expansion unit from the blade server.

Installing an expansion unit

Attention: If a high-speed expansion card is installed in the blade server system board, you cannot install an expansion unit.

To install an expansion unit, complete the following steps.

Expansion unit

Blade-cover release

Blade-cover release
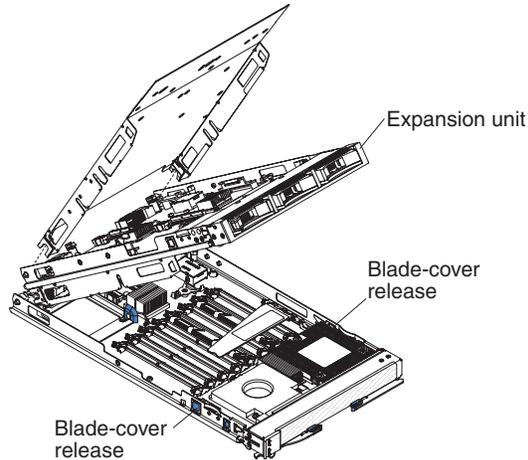
1. Touch the static-protective package that contains the expansion unit to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion unit from the package.
2. Orient the expansion unit above the blade server.
3. Lower the expansion unit so that the slots at the rear slide down onto the cover pins at the rear of the blade server.
4. Close the expansion unit:
   - If the expansion unit has an extraction device, pivot the expansion unit closed; then, use the extraction device to fully seat the expansion unit on the system board. These extraction devices can be of several types, including thumb screws or levers.
   - If the expansion unit has no extraction device, pivot the expansion unit closed; then, press the expansion unit firmly into place until the blade-cover releases click.

   The connectors on the expansion unit automatically align with and connect to the connectors on the system board.

   Note: Some expansion units have their own cover and do not require installation of a separate cover.
5. Install the blade-server cover, if required (see "Installing the blade server cover" on page 28).
6. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25 for instructions).

Removing the bezel assembly

To remove the bezel assembly, complete the following steps.
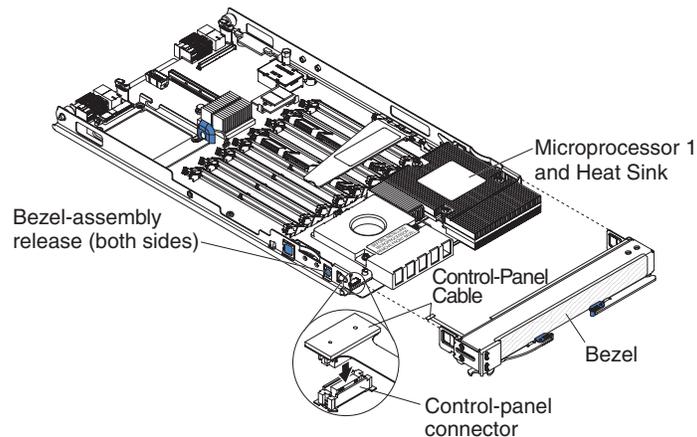
Microprocessor 1
and Heat Sink

Bezel-assembly
release (both sides)

Control-Panel
Cable
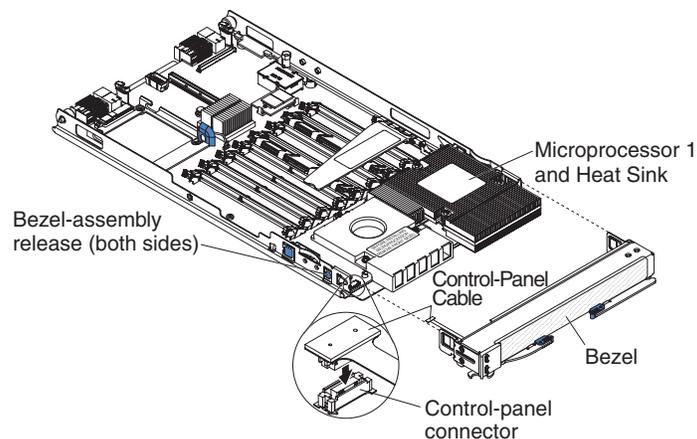
Bezel

Control-panel
connector

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24 for instructions).
3. Open the blade server cover (see "Removing the blade server cover" on page 27 for instructions).
4. Press the bezel-assembly release on each side of the blade server and pull the bezel assembly away from the blade server approximately 1.2 cm (0.5 inch).
5. Disconnect the control panel cable from the control panel connector.
6. Pull the bezel assembly away from the blade server.
7. Store the bezel assembly in a safe place.

Installing the bezel assembly

To install the bezel assembly, complete the following steps.

Microprocessor 1
and Heat Sink

Bezel-assembly
release (both sides)

Control-Panel
Cable

Bezel

Control-panel
connector

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.
2. Connect the control-panel cable to the control-panel connector on the system board.
3. Carefully slide the bezel assembly onto the blade server until it clicks into place.
4. Install the cover onto the blade server.
5. Install the blade server into the BladeCenter unit.

Removing a SAS hard disk drive

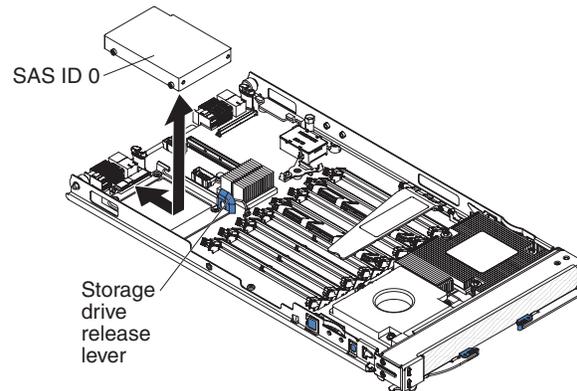To remove a SAS hard disk drive, complete the following steps.

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24).
3. Remove the blade server cover (see "Removing the blade server cover" on page 27 for instructions).
4. Locate the hard disk drive (SAS ID 0).
5. While pulling the blue release lever at the front of the hard disk drive tray, slide the drive forward to disengage it from the connector at the rear of the drive tray: then, lift the drive out of the drive tray.

   Attention: Do not press on the top of the drive. Pressing the top might damage the drive.
6. To remove the drive tray, remove the four screws that secure it to the system board and lift it out of the blade server.
7. If you are instructed to return the hard disk drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a SAS hard disk drive

To install a SAS hard disk drive, complete the following steps.
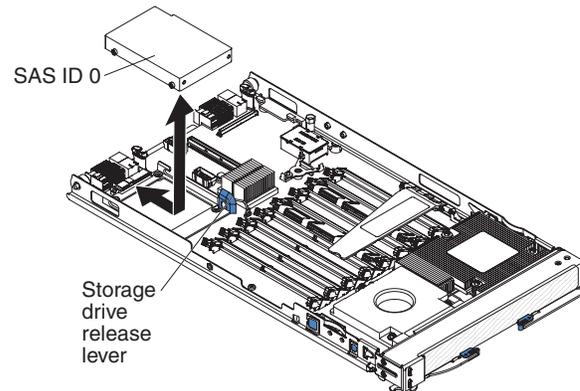
1. Identify the location (SAS ID 0) where the hard disk drive will be installed.
2. Touch the static-protective package that contains the hard disk drive to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the hard disk drive from the package.

   Attention: Do not press on the top of the drive. Pressing the top might damage the drive.
3. Place the drive into the hard disk drive tray and push it toward the rear of the drive, into the connector until the drive moves past the lever at the front of the tray.
4. Install the blade server cover (see "Installing the blade server cover" on page 28 for instructions).
5. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25 for instructions).

Removing a DIMM baffle

To remove a DIMM baffle, complete the following steps.

M3.5 screws (2)

DIMM baffle

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24).
3. Remove the blade server cover (see "Removing the blade server cover" on page 27).
4. Remove the two screws that secure the DIMM baffle to the system board.
5. Lift the DIMM baffle off of the system board.
6. If you are instructed to return the DIMM baffle, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.
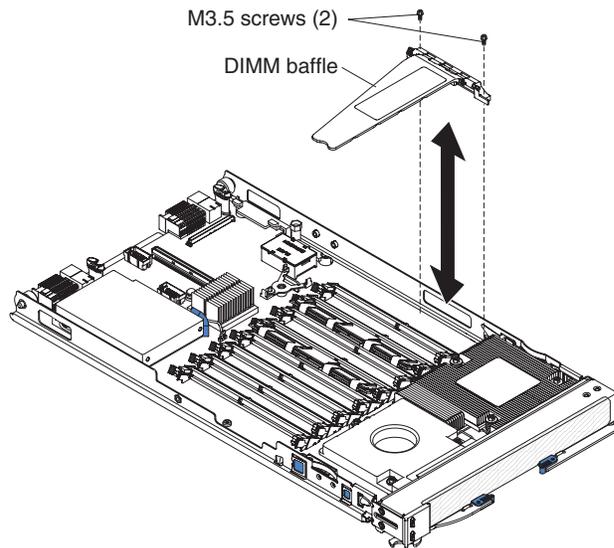
Installing a DIMM baffle

To install a DIMM baffle, complete the following steps.

1. Orient the DIMM baffle on the system board, above DIMM connector 1, by aligning the screw holes in the DIMM baffle with the holes in the system board.
2. Install the two screws that secure the DIMM baffle to the system board.
3. Install the blade server cover (see "Installing the blade server cover" on page 28).
4. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25).
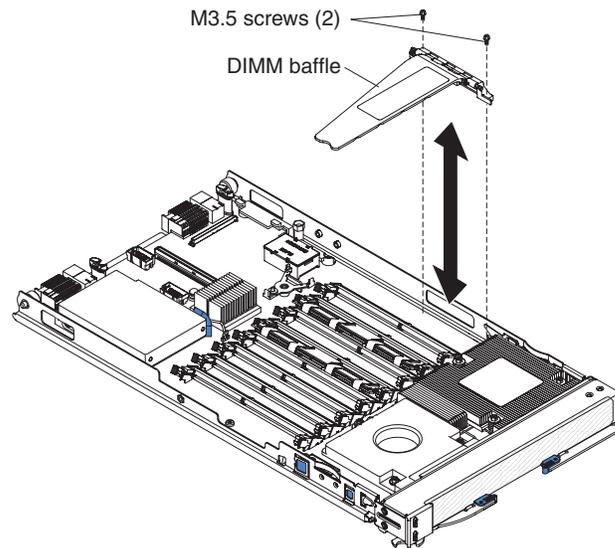
Removing a memory module

The following illustration shows the locations of the DIMM sockets on the system board.

DIMM 1 (J144)
DIMM 2 (J143)
DIMM 3 (J142)
DIMM 4 (J141)

Microprocessor 1

Microprocessor 2

DIMM 5 (J171)
DIMM 6 (J172)
DIMM 7 (J173)
DIMM 8 (J174)

To remove a DIMM, complete the following steps.

DIMM

Retaining clip
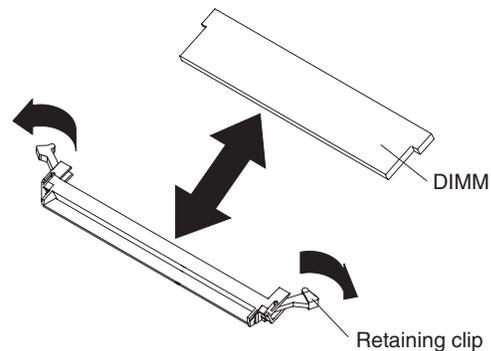
1. Read the safety information that begins vii and "Installation guidelines" on page 21

2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24).

3. Remove the blade server cover (see "Removing the blade server cover" on page 27).

4. Locate the DIMM connectors.

5. Lift the DIMM baffle to access the DIMM connectors.

DIMM baffle

.
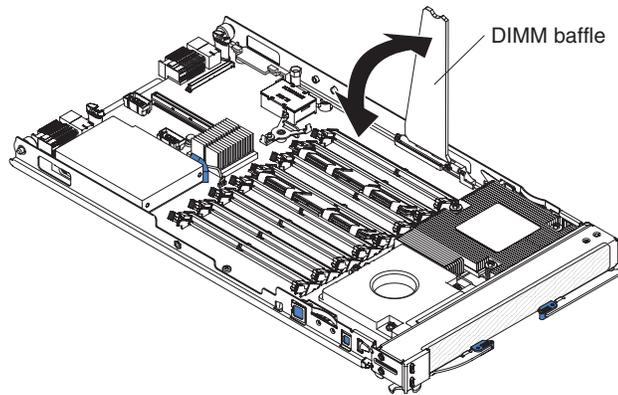
6. Determine which DIMM you want to remove from the blade server.

   Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.

7. Move the DIMM retaining clips on the side of the DIMM socket to the open position by pressing the retaining clips away from the center of the DIMM socket.

8. Using your fingers, pull the DIMM out of the DIMM socket.

9. Lower the DIMM baffle.

10. If you are instructed to return the DIMM, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.
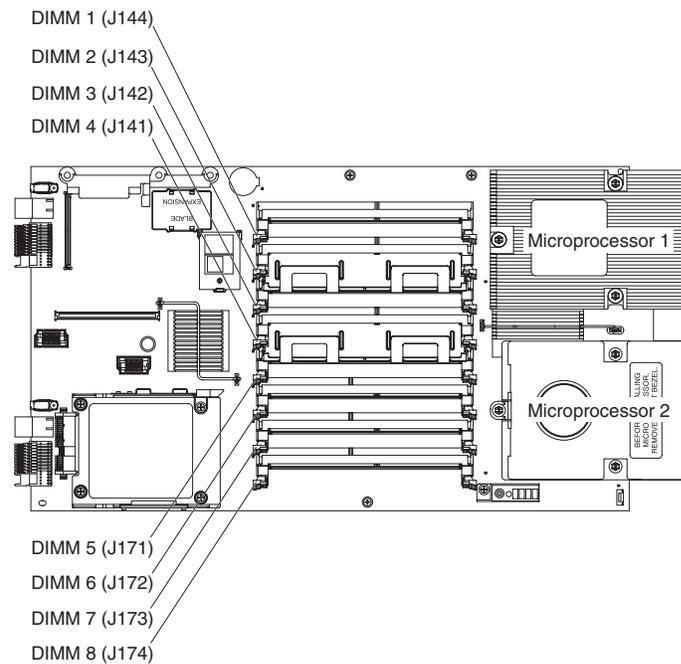
Installing a memory module

When you install memory, you must install a pair of matched DIMMs. Install the DIMMs in the following order:

Note: The third and fourth pair must be installed at the same time.

Pair	DIMM connectors
First	5 (J171) and 7 (J173)
Second	2 (J143) and 4 (J141)
Third	1 (J144) and 3 (J142)
Fourth	6 (J172) and 8 (J174)

To install a DIMM, complete the following steps.

DIMM

Retaining clip
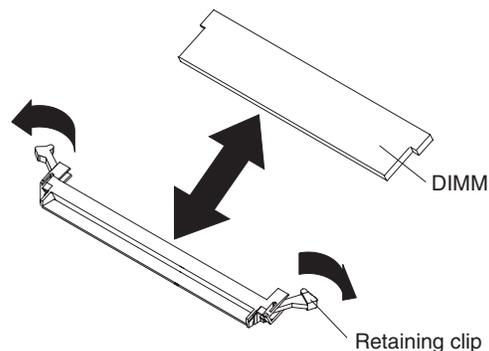
1. Read the documentation that comes with the DIMM.

2. Locate the DIMM connectors.

3. Lift the DIMM baffle to access the DIMM connectors.

4. Determine the connectors into which you will install the DIMMs.

5. Touch the static-protective package that contains the DIMM to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the DIMM from the package.

   Attention: To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.

6. Make sure that both of the connector retaining clips are in the fully open position.

7. Turn the DIMM so that the DIMM keys align correctly with the connector on the system board.

   Note: DIMMs installed in to DIMM connectors 1 through 4 align differently from DIMMs installed in to DIMM connectors 5 through 8.

8. Insert the DIMM by pressing the DIMM along the guides into the connector. Make sure that the retaining clips snap into the closed positions.

   Attention: 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. Lower the DIMM baffle.

10. Install the blade server cover (see "Installing the blade server cover" on page 28).

11. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25).

Removing a modular flash drive

The following illustration shows how to remove a modular flash drive from a blade server.
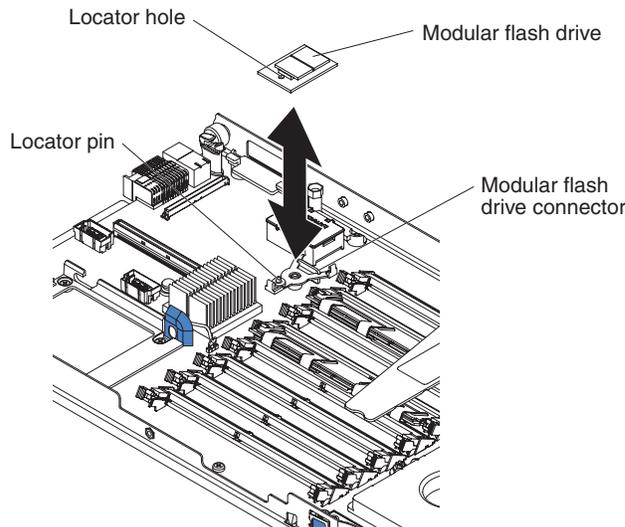
Locator hole — Modular flash drive

Locator pin — Modular flash drive connector

To remove a modular flash drive, complete the following steps:

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.

2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24).

3. Remove the blade server cover (see "Removing the blade server cover" on page 27 for instructions).

4. Locate the modular flash drive on the blade server.

5. Use your fingers to pull the modular flash drive up from the modular flash drive connector.

   Note: For modular flash drives with a pull tab, pull up on the pull tab to remove the modular flash drive from the modular flash drive connector.

6. If you are instructed to return the modular flash drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a modular flash drive

The following illustration shows how to install a modular flash drive in a blade server.

Locator hole   Modular flash drive

Locator pin   Modular flash drive connector
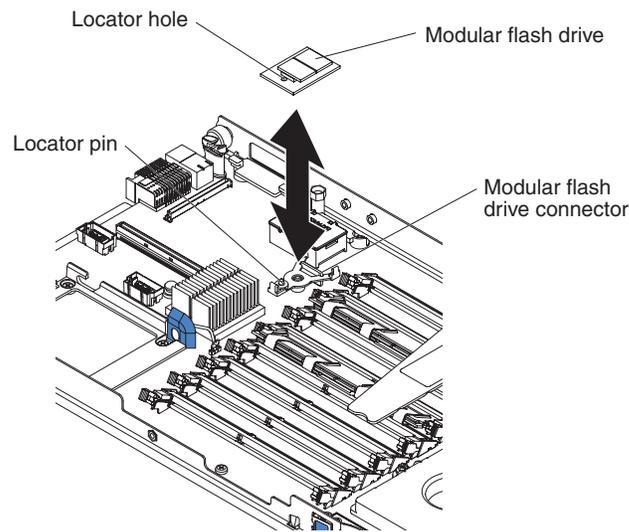
To install a modular flash drive, complete the following steps:

1. Read the documentation that comes with the modular flash drive.

2. Locate the modular flash drive connector pins (J175) on the blade server.

3. Touch the static-protective package that contains the modular flash drive to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the modular flash drive from the package.

4. Locate the modular flash drive connector on the blade server.

5. Use the locator hole on the modular flash drive and the locator pin on the modular flash drive connector to orient the modular flash drive.

6. Press down on edges of the modular flash drive to seat it in to the connector.

   Note: For device-driver and configuration information to complete the installation of the modular flash drive, see the documentation that comes with the modular flash drive.

7. Install the blade server cover (see "Installing the blade server cover" on page 28).

8. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25).

Removing a Concurrent KVM Feature Card

To remove a cKVM Feature Card, complete the following steps.
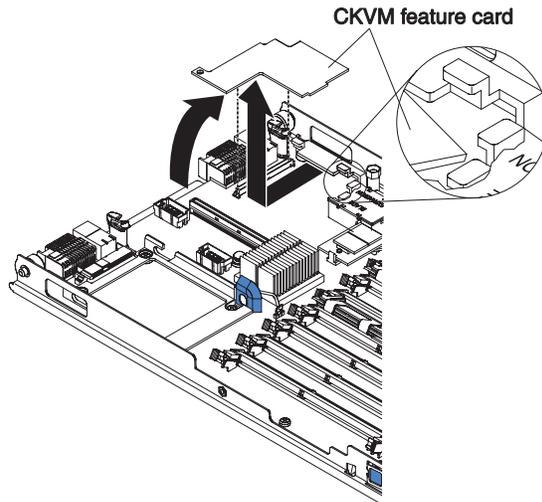
CKVM feature card

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24).
3. Remove the blade server cover (see "Removing the blade server cover" on page 27 for instructions).
4. If a small-form-factor expansion card or a high-speed expansion card is installed, remove it (see "Removing a small-form-factor expansion card" on page 42 or "Removing a high-speed expansion card" on page 46).
5. Gently pivot the narrow end of the card out of the cKVM card connectors; then, slide the notched end of the card out of the tabs on the expansion card bracket and lift the card out of the blade server.
6. If you are instructed to return the cKVM Feature Card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a Concurrent KVM Feature Card

To install a Concurrent KVM (cKVM) Feature Card, complete the following steps.
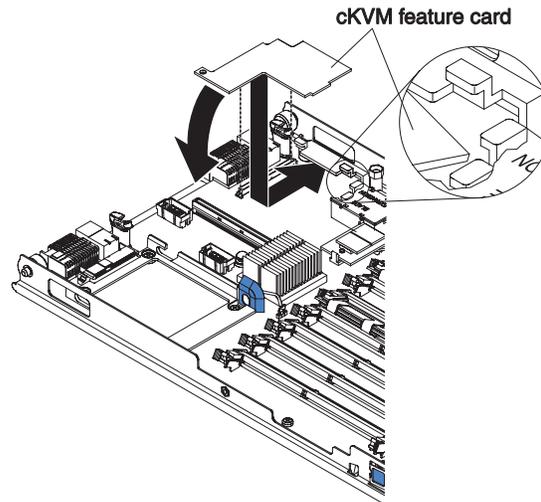
cKVM feature card

1. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the Concurrent KVM Feature Card from the package.

2. Locate the concurrent-KVM connector and orient the Concurrent KVM Feature Card.

3. Slide the right side of the card (the side of the card that is away from the concurrent-KVM connector) between the two tabs at the right side of the expansion card bracket; then, gently pivot the card into the connector.

   Note: For device-driver and configuration information to complete the installation of the Concurrent KVM Feature Card, see the documentation that comes with the card.

4. If you removed a small-form-factor expansion card or a high-speed expansion card, reinstall it (see "Installing a small-form-factor expansion card" on page 43 or "Installing a high-speed expansion card" on page 47).

5. Install the blade server cover (see "Installing the blade server cover" on page 28).

6. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25).

Removing a small-form-factor expansion card

To remove a small-form-factor expansion card, complete the following steps.

Small-form-factor

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24).
3. Remove the blade server cover (see "Removing the blade server cover" on page 27 for instructions).
4. Gently pivot the wide end of the card out of the expansion card connectors; then, slide the notched end of the card out of the raised hook on the expansion card bracket and lift the card out of the blade server.
5. If you are instructed to return the expansion card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a small-form-factor expansion card

To install a small-form-factor expansion card, complete the following steps.
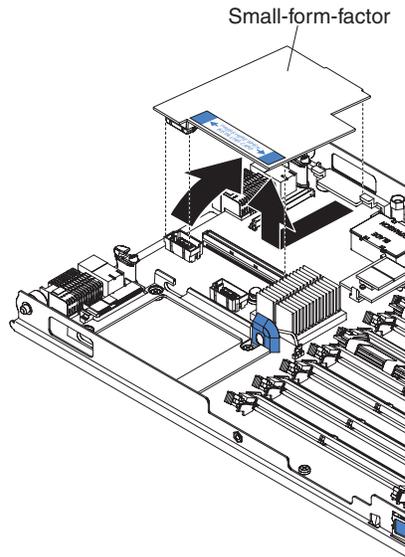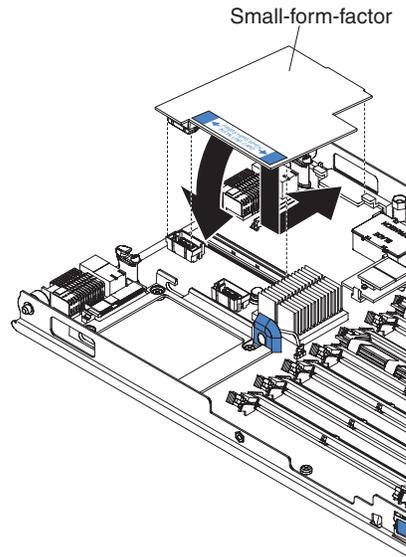
Small-form-factor

1. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion card from the package.
2. Orient the expansion card over the system board.
3. Slide the notch in the narrow end of the card into the raised hook on the expansion card bracket; then, gently pivot the card into the expansion card connector.

    Note: For device-driver and configuration information to complete the installation of the expansion card, see the documentation that comes with the expansion card.

4. Install the blade server cover (see "Installing the blade server cover" on page 28).
5. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25).

Removing a standard-form-factor expansion card

To remove a standard-form-factor expansion card, complete the following steps.

Standard-form-factor
expansion card

Expansion
Card
Bracket

Hard Disk
Drive Tray

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24).
3. Remove the blade server cover (see "Removing the blade server cover" on page 27 for instructions).
4. Gently pivot the wide end of the card out of the expansion card connectors; then, slide the notched end of the card out of the raised hook on the expansion card bracket and lift the card out of the blade server.
5. If you are instructed to return the expansion card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a standard-form-factor expansion card

To install a replacement standard-form-factor expansion card, complete the following steps.
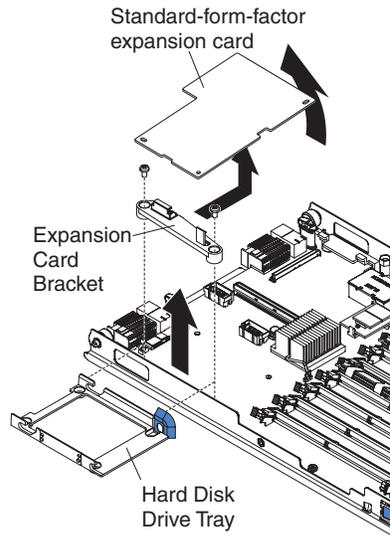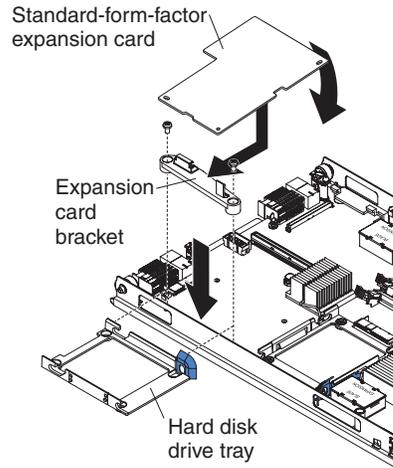

1. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion card from the package.
2. Orient the expansion card over the system board and slide the narrow end of the card into the raised hook on the expansion card bracket; then, gently pivot the wide end of the card into the expansion card connectors.

   Note: For device-driver and configuration information to complete the installation of the expansion card, see the documentation that comes with the expansion card.
3. Install the blade server cover (see "Installing the blade server cover" on page 28).
4. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25).

Removing a high-speed expansion card

To remove a high-speed expansion card, complete the following steps.
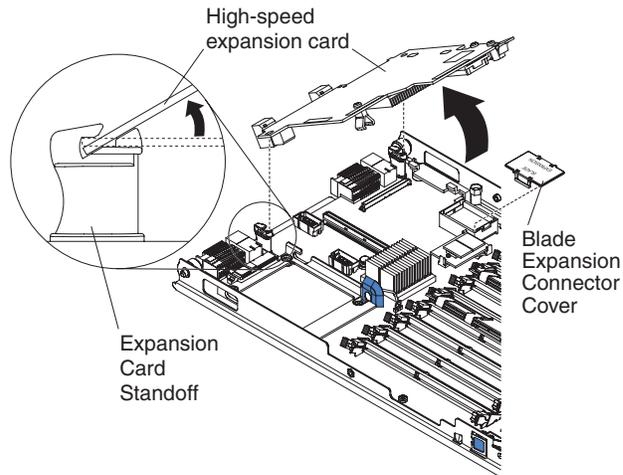
High-speed
expansion card

Blade
Expansion
Connector
Cover

Expansion
Card
Standoff

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.

2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24).

3. Remove the blade server cover (see "Removing the blade server cover" on page 27 for instructions).

4. Pivot the narrow end of the card away from the blade expansion connector; then, slide the slots at the back end of the card out of the expansion-card standoffs and lift the card out of the blade server.

5. If you are instructed to return the expansion card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a high-speed expansion card

To install a high-speed expansion card, complete the following steps.
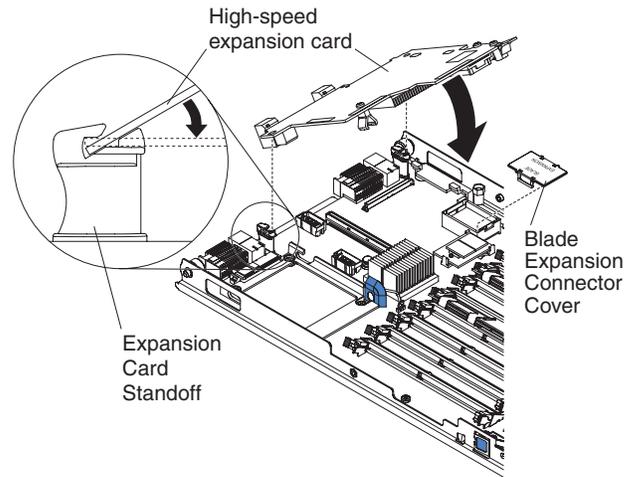
1. Locate the blade expansion connector. If the blade expansion connector cover is installed, use your fingers to remove it.
2. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion card from the package.
3. Orient the expansion card and slide the slots at the back end of the card onto the pins on the expansion card standoff; then, gently pivot the card into the blade expansion connector.
4. Firmly press on the indicated locations to seat the expansion card.

   Note: For device-driver and configuration information to complete the installation of the expansion card, see the documentation that comes with the expansion card.
5. Install the blade server cover (see "Installing the blade server cover" on page 28).
6. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25).

Removing the battery

To remove the battery, complete the following steps.
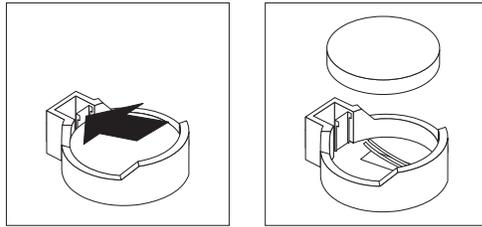
1. Read the safety information that begins on page vii and "Installation guidelines" on page 21
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24 for instructions).
3. Remove the blade server cover (see "Removing the blade server cover" on page 27 for instructions).
4. Locate the battery on the system board.
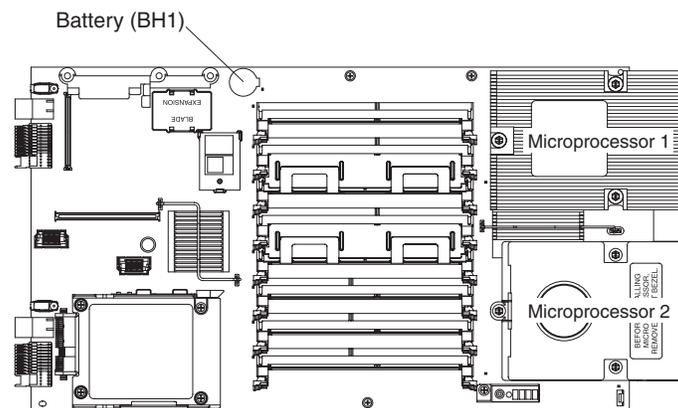
5. Use one finger to press the top of the battery clip away from the battery. The battery pops up when released.
6. Use your thumb and index finger to lift the battery from the socket.
7. Dispose of the battery as required by local ordinances or regulations.

Installing the battery

The following notes describe information that you must consider when you are replacing the battery in the blade server.

- When you are replacing the battery, you must replace it with a lithium battery of the same type from the same manufacturer.
- 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 marketing representative or authorized reseller.
- After you replace the battery, you must reconfigure the server and reset the system date and time.
- To avoid possible danger, read and follow the following safety statement.

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.

To install the battery, complete the following steps.
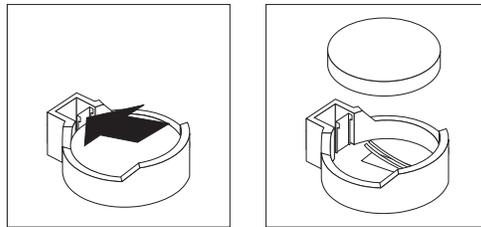
1. Follow any special handling and installation instructions that come with the battery.
2. Locate the battery connector.
3. Insert the battery:
   a. Tilt the battery so that you can insert it into the socket on the side opposite the battery clip.
   b. Press the battery down into the socket until it clicks into place. Make sure the battery clip holds the battery securely.
4. Install the blade server cover (see "Installing the blade server cover" on page 28).
5. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25).
6. Turn on the blade server and run the Configuration/Setup Utility program. Set configuration parameters as needed (see "Using the Configuration/Setup Utility program" on page 11 for information).

Removing and replacing FRUs

FRUs must be installed only by trained service technicians.

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

Removing a microprocessor and heat sink

Read the following important guidelines before removing a microprocessor that is not faulty (for example, when you are replacing the system board assembly).

If you are not replacing a defective heat sink or microprocessor, the thermal material on the heat sink and microprocessor will remain effective if you complete the following steps:

1. Carefully handle the heat sink and microprocessor when removing or installing these components. Do not touch the thermal material or otherwise allow it to become contaminated.

2. In a dual-microprocessor blade server, the microprocessor and the heat sink are a matched set. When replacing a system board, first transfer the heat sink and microprocessor from one socket to the new system board; then, transfer the other heat sink and microprocessor. (This will ensure that the thermal material remains evenly distributed between each heat sink and microprocessor.)

Notes:

- The heat-sink FRU is packaged with the thermal material applied to the underside. This thermal material is not available as a separate FRU. The heat sink must be replaced when new thermal material is required, such as when a defective microprocessor is replaced or if the thermal material is contaminated or has come in contact with another object other than its paired microprocessor.

- The microprocessor FRU for this system board includes a heat sink.

- A heat-sink FRU can be ordered separately if the thermal material becomes contaminated.

To remove a microprocessor, complete the following steps.
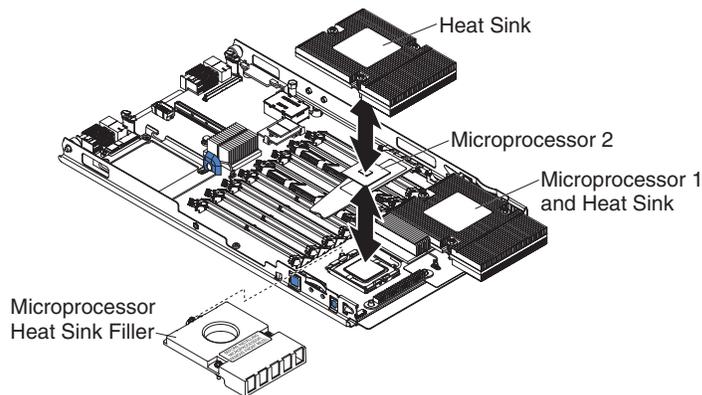
1. Read the safety information that begins on page vii, and "Installation guidelines" on page 21.

2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24 for instructions).

3. Remove the blade server cover (see "Removing the blade server cover" on page 27 for instructions).

4. Remove the bezel assembly (see "Removing the bezel assembly" on page 31 for instructions).

5. Identify the microprocessor that is 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 91).

6. Remove the heat sink.

   Attention: Do not touch the thermal material on the bottom of the heat sink. Touching the thermal material will contaminate it. If the thermal material on the microprocessor or heat sink becomes contaminated, you must replace the heat sink.

   a. Press firmly on the captive screws that retain the heat sink and loosen them with a screwdriver, alternating between screws until they are loose.

   b. Use your fingers to gently pull the heat sink from the processor.

   Attention: Do not use any tools or sharp objects to lift the release lever on the microprocessor socket. Doing so might result in permanent damage to the system board.
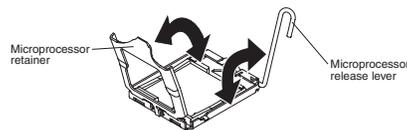
   Attention: Do not touch the pins in the microprocessor socket. Touching these pins might result in permanent damage to the system board.

7. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops in the fully open position (approximately a 90° angle). Lift the microprocessor retainer cover upward.

8. Use your fingers to pull the microprocessor out of the socket.
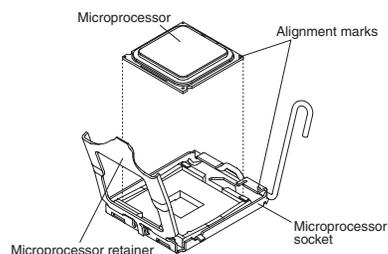
9. If you are instructed to return the microprocessor and heat sink, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a microprocessor and heat sink

To install a microprocessor and heat sink, complete the following steps.
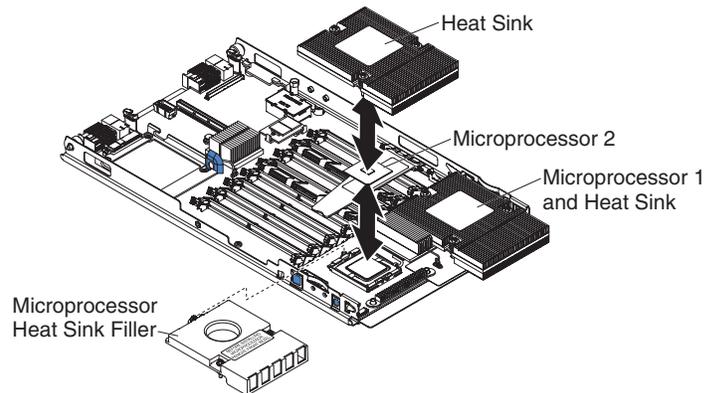
Attention: Do not touch the contacts in the microprocessor socket. Touching these contacts might result in permanent damage to the system board.

1. Install the microprocessor:

   Attention: Do not use any tools or sharp objects to lift the locking lever on the microprocessor socket. Doing so might result in permanent damage to the system board.
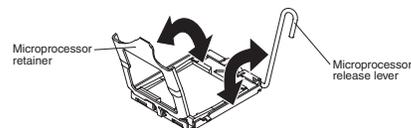
   a. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops in the fully open position (approximately a 90° angle), as shown.

   b. Rotate the microprocessor retainer on the microprocessor socket from its closed position until it stops in the fully open position (approximately a 90° angle), as shown.

   c. Touch the static-protective package that contains the microprocessor to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the microprocessor from the package.

   d. Remove the cover from the bottom of the microprocessor.
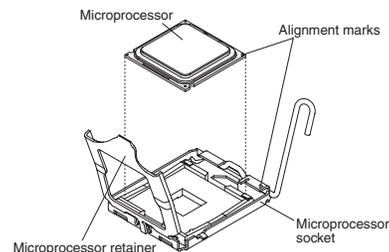
   e. Center the microprocessor over the microprocessor socket. Align the triangle on the corner of the microprocessor with the triangle on the corner of the socket and carefully place the microprocessor into the socket.

Attention:

- Do not press the microprocessor into the socket.
- Make sure that the microprocessor is oriented and aligned correctly in the socket before you try to close the microprocessor retainer.

    f. Carefully close the microprocessor retainer.

    g. Rotate the locking lever on the microprocessor socket to the closed and locked position. Make sure that the lever is secured in the locked position by the tab on the microprocessor socket.

2. Install a heat sink on the microprocessor.

   Attention:

   - Do not set down the heat sink after you remove the plastic cover.
   - Do not touch the thermal material on the bottom of the heat sink. Touching the thermal material will contaminate it. If the thermal material on the microprocessor or heat sink becomes contaminated, contact your service technician.

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

   b. Make sure that the thermal material is still on the bottom of the heat sink; then, align and place the heat sink on top of the microprocessor in the retention bracket, thermal material side down. Press firmly on the heat sink.

   c. Align the three screws on the heat sink with the holes on the heat-sink retention module.

   d. Press firmly on the captive screws and tighten them with a screwdriver, alternating between screws until they are tight. If possible, each screw should be rotated two full rotations at a time. Repeat until the screws are tight. Do not overtighten the screws by using excessive force. If you are using a torque wrench, tighten the screws to 8.5 to 13 Newton-meters (Nm) (6.3 to 9.6 inch-pounds).

3. Install the bezel assembly (see "Installing the bezel assembly" on page 31).

4. Install the blade server cover (see "Installing the blade server cover" on page 28).

5. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25).

Removing the system board assembly

When replacing the system board, you will replace the system board and blade base as one assembly. After replacement, you must either update the blade server with the latest firmware or restore the pre-existing firmware that the customer provides on a diskette or CD image.

Note: See "System board layouts" on page 8 for more information on the locations of the connectors, jumpers and LEDs on the system board.

To remove the system board assembly, complete the following steps:

1. Read the safety information that begins on page vii, and "Installation guidelines" on page 21.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 24 for instructions).
3. Remove the blade server cover (see "Removing the blade server cover" on page 27).
4. Remove the blade server bezel assembly (see "Removing the bezel assembly" on page 31).
5. Remove all of the installed components in the following list from the system board assembly; then, place them on a non-conductive surface or install them on the new system board assembly.
   - I/O-expansion card. See "Removing a small-form-factor expansion card" on page 42, "Removing a standard-form-factor expansion card" on page 44, and "Removing a high-speed expansion card" on page 46.
   - Modular Flash Drive. See "Removing a modular flash drive" on page 38.
   - Concurrent KVM feature card. See "Removing a Concurrent KVM Feature Card" on page 40.
   - Hard disk drive. See "Removing a SAS hard disk drive" on page 32.
   - Microprocessors and heat sinks. See "Removing a microprocessor and heat sink" on page 50.
   - DIMMs. See "Removing a memory module" on page 36.
   - DIMM baffle. See "Removing a DIMM baffle" on page 34.
   - Battery. See "Removing the battery" on page 48.
6. Remove the socket covers from the microprocessor sockets on the new system board and place them on the microprocessor sockets of the system board you are removing.
7. If you are instructed to return the system board assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the system board assembly

To install the system board assembly, complete the following steps:

1. Install all of the components in the following list that were removed from the old system board assembly onto the new system board assembly.
   - Concurrent KVM feature card. See "Installing a Concurrent KVM Feature Card" on page 41.
   - Modular Flash Drive. "Installing a modular flash drive" on page 39
   - I/O-expansion card. See "Installing a small-form-factor expansion card" on page 43, "Installing a standard-form-factor expansion card" on page 45, and "Installing a high-speed expansion card" on page 47.
   - Hard disk drive. See "Installing a SAS hard disk drive" on page 33.
   - Microprocessors and heat sinks. See "Installing a microprocessor and heat sink" on page 52.
   - DIMMs. See "Installing a memory module" on page 37.
   - DIMM baffle. See "Installing a DIMM baffle" on page 35.
   - Battery. See "Installing the battery" on page 48.
2. Install the bezel assembly (see "Installing the bezel assembly" on page 31).
3. Install the blade server cover (see "Installing the blade server cover" on page 28).
4. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 25).

Chapter 5. Diagnostics

This chapter describes the diagnostic tools that are available to help you solve problems that might occur in the blade server.

Note: The blade server uses shared resources that are installed in the BladeCenter unit. Problems with these shared resources might appear to be in the blade server (see "Solving shared BladeCenter resource problems" on page 102 for information about isolating problems with these resources). See the *Problem Determination and Service Guide* or the *Hardware Maintenance Manual and Troubleshooting Guide* for your BladeCenter unit and other BladeCenter component documentation for diagnostic procedures for shared BladeCenter components.

If you cannot locate and correct the problem using the information in this chapter, see Appendix A, "Getting help and technical assistance," on page 111 for more information.

Diagnostic tools

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

- **POST beep codes, error messages, and error logs**

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

- **Troubleshooting tables**

  These tables list problem symptoms and actions to correct the problems. See "Troubleshooting tables" on page 79 for more information.

- **Light path diagnostics**

  Use the light path diagnostics to diagnose system errors quickly. See "Light path diagnostics" on page 91 for more information.

- **Diagnostic programs, messages, and error codes**

  The diagnostic programs are the primary method of testing the major components of the blade server. These programs are stored in read-only memory (ROM) on the blade server. See "Diagnostic programs, messages, and error codes" on page 94 for more information.

POST

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

If a power-on password is set, you must type the password and press Enter, when prompted, for POST to run.

If POST is completed without detecting any problems, a single beep sounds, and the blade server startup is completed.

If POST detects a problem, more than one beep might sound, or an error message is displayed. See "Beep code descriptions" and "POST error codes" on page 67 for more information.

POST beep codes

A beep code is a combination of short or long beeps or a series of short beeps that are separated by pauses. For example, a "1-2-3" beep code is one short beep, a pause, two short beeps, a pause, and three short beeps. A beep code other than one beep indicates that POST has detected a problem. To determine the meaning of a beep code, see "Beep code descriptions." If no beep code sounds, see "No-beep symptoms" on page 61.

Beep code descriptions

The following table describes the beep codes and suggested actions to correct the detected problems.

A single problem might cause more than one error message. When this occurs, correct the cause of the first error message. The other error messages usually will not occur the next time POST runs.

Exception: If there are multiple error codes or light path diagnostics LEDs that indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See "Microprocessor problems" on page 82 for information about diagnosing microprocessor problems.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Beep code	Description	Action

1-1-3	CMOS write/read test failed.	1. Reseat the battery
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Battery
		  b. (Trained service technician only) System board assembly

1-1-4	BIOS ROM checksum failed.	1. Update the BIOS code.
		2. Reseat the DIMMs.
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. DIMMs
		  b. (Trained service technician only) System board assembly

1-2-1	Programmable interval timer failed.	(Trained service technician only) Replace the system board assembly.
1-2-2	DMA initialization failed.	(Trained service technician only) Replace the system board assembly.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Beep code	Description	Action
1-2-3	DMA page register write/read failed.	(Trained service technician only) Replace the system board assembly.

1-2-4	RAM refresh verification failed.	1. Reseat the DIMMs.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. DIMMs
		  b. (Trained service technician only) System board assembly

1-3-1	First 64K RAM test failed.	1. Reseat the DIMMs.
		2. Replace the lowest-numbered pair of DIMMs with an identical known good pair of DIMMs; then, restart the server. If the beep code error remains, go to 3b. Return one DIMM at a time from the failed pair to its connector, restarting the server after each DIMM, to identify the failed DIMM.
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. DIMMs
		  b. (Trained service technician only) System board assembly

2-1-1	Secondary DMA register test failed.	(Trained service technician only) Replace the system board assembly.
2-1-2	Primary DMA register test failed.	(Trained service technician only) Replace the system board assembly.
2-1-3	Primary interrupt mask register test failed.	(Trained service technician only) Replace the system board assembly.
2-1-4	Secondary interrupt mask register test failed.	(Trained service technician only) Replace the system board assembly.
2-2-2	Keyboard controller test failed.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 2. (Trained service technician only) Replace the system board assembly.
2-3-1	Screen initialization failed.	(Trained service technician only) Replace the system board assembly.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Beep code	Description	Action
2-4-4	Unsupported memory configuration	1. Check the DIMM error LEDs on the blade server. 2. Check management module event log for DIMM error messages. 3. Replace noncompatible or failing DIMMs in the blade server.
3-1-1	Timer tick interrupt failed.	(Trained service technician only) Replace the system board assembly.
3-1-2	Interval timer channel 2 failed.	(Trained service technician only) Replace the system board assembly.

3-1-4	Time-of-day clock failed.	1. Reseat the battery.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Battery
		  b. (Trained service technician only) System board assembly

3-3-2	Critical SMBUS error occurred.	1. Power down the blade server and reseat it in the BladeCenter unit.
		2. Reseat the DIMMs.
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. DIMMs
		  b. (Trained service technician only) System board assembly

3-3-3	No operational memory in system.	**Important:** 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 blade server three times to force the system BIOS to reset the memory connectors from disabled to enabled.
		1. Install or reseat the DIMMs and restart the blade server three times.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. DIMMs
		  b. (Trained service technician only) System board assembly

No-beep symptoms

The following table describes situations in which no beep code sounds when POST is completed.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

No-beep symptom	Action
No beep and the blade server operates correctly	(Trained service technician only) Replace the system board assembly.
No beep and no video (system-error LED is off)	See "Solving undetermined problems" on page 106.
No beep and no video (system attention LED is lit)	See "Light path diagnostics" on page 91.

Error logs

The BMC log contains all system status messages from the blade server service processor. The management-module event log in your BladeCenter unit contains messages that were generated on each blade server during POST and status messages from the BladeCenter service processor. (See the *Management Module User's Guide* for more information.)

The following illustration shows an example of a BMC log entry.

```
                    BMC System Event Log
---------------------------------------------------------
Get Next Entry
Get Previous Entry
Clear BMC SEL



Entry Number=      00005 / 00011
Record ID=         0005
Record Type=       02
Timestamp=         2005/01/25  16:15:17
Entry Details:     Generator ID= 0020
                   Sensor Type= 04
                   Assertion Event
                   Fan
                   Threshold
                   Lower Non-critical - going high

                   Sensor Number= 40
                   Event Direction/Type= 01

                   Event Data= 52 00 1A
```

Important:

- A single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After you correct the cause of the first error message, the other error messages usually will not occur the next time you run the test.
- The management-module event log in your BladeCenter unit lists messages according to the position of the blade server in the blade bays. If a blade server is moved from one bay to another, the management-module event log will report messages for that blade server using the new bay number; messages for that blade server that were generated before the move will still be listed using the previous bay number.

The BMC log is limited in size. When the log is full, new entries will not overwrite existing entries; therefore, you must periodically clear the BMC log through the Configuration/Setup Utility program (the menu choices are described in the *Installation and User's Guide.)* When you are troubleshooting an error, be sure to clear the BMC log so that you can find current errors more easily.

Entries that are written to the BMC log during the early phase of POST show an incorrect date and time as the default time stamp; however, the date and time are corrected as POST continues.

Each BMC log entry appears on its own page. To display all the data for an entry, use the Up Arrow (↑) and Down Arrow (↓) keys or the Page Up and Page Down keys. To move from one entry to the next, select **Get Next Entry** or **Get Previous Entry**.

The BMC log indicates an assertion event when an event has occurred. It indicates a deassertion event when the event is no longer occurring.

Some of the error codes and messages in the BMC log are abbreviated.

You can view the contents of the BMC log from the Configuration/Setup Utility program and from the diagnostic programs.

When you are troubleshooting PCI-X slots (I/O slots), note that the error logs report the PCI-X buses numerically. The numerical assignments vary depending on the configuration. You can check the assignments by running the Configuration/Setup Utility program (see the *Installation and User's Guide* for more information).

Viewing the BMC log from the Configuration/Setup Utility program

For complete information about using the Configuration/Setup Utility program, see the *Installation and User's Guide*.

To view the BMC log, complete the following steps:

1. Turn on the blade server.
2. When the prompt `Press F1 for Configuration/Setup` appears, press F1. If you have set a power-on password, you must type the password and press Enter to start the Configuration/Setup Utility program.
3. Select **Advanced Settings → Baseboard Management Controller (BMC) settings → BMC System Event Log**.

Viewing the BMC log from the diagnostic programs

The BMC log contains the same information, whether it is viewed from the Configuration/Setup Utility program or from the diagnostic programs.

For information about using the diagnostic programs, see "Running the diagnostic programs" on page 94.

To view the BMC log, complete the following steps:

1. If the blade server is running, turn off the blade server.
2. Turn on the blade server.
3. When the prompt `F2 for Diagnostics` appears, press F2.
4. From the top of the screen, select **Hardware Info**.
5. From the list, select **BMC Log**.

BMC error messages

The following table lists BMC error messages and suggested actions to correct the detected problems.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error message	Action
cKVM card fault	1. Reseat the cKVM feature card. 2. Replace the cKVM feature card.

BEM 1 fault	1. Reseat the following components one at a time, in the order shown, restarting the blade server each time:
	  a. ServeRAID SAS controller
	  b. RAID battery
	  c. Expansion unit
	2. Replace the expansion unit.

BEM 2 fault	1. Reseat the expansion unit. 2. Replace the expansion unit.
High speed expansion card fault	1. Reseat the high-speed expansion card. 2. Replace the high-speed expansion card.

Front panel cable is not connected to system board	1. Reseat the control panel cable.
	2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
	  a. Bezel assembly
	  b. (Trained service technician only) System board assembly

BSE RAID battery failure	1. Reseat the SAS controller battery connector in the BladeCenter Storage Expansion Unit 3. 2. Replace the SAS controller battery in the BladeCenter Storage Expansion Unit 3.

BSE RAID fault	1. Reseat the ServeRAID SAS controller in the BladeCenter Storage Expansion Unit 3.
	2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
	  a. ServeRAID SAS controller
	  b. BladeCenter Storage Expansion Unit 3

Firmware (BIOS) halted, System management bus error	1. Update the blade server firmware. 2. Update the blade server and option device drivers.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error message	Action

PCI bus timeout- system error	1. Remove the blade server from the BladeCenter; then, reinstall it.
	 2. Reseat all the options installed in the blade server one at a time, restarting the blade server each time to determine where the problem is located.
	 3. Remove options from the blade server one at a time to determine where the problem is located.
	 4. Replace the following components one at a time, in the order shown, restarting the blade server each time:
	   a. All options installed in the blade server
	   b. (Trained service technician only) System board assembly

Microprocessor *xx* halted	1. Remove the blade server from the BladeCenter; then, reinstall it.
	 2. Reseat the microprocessor *xx*.
	 3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
	   a. (Trained service technician only) Replace the microprocessor *xx*
	   b. (Trained service technician only) System board assembly

Microprocessor *xx* temperature warning	1. Make sure that the BMC firmware is the latest level. See "Firmware updates" on page "Firmware updates" on page 11. 2. Make sure that the blade server is sufficiently cooled. 3. Make sure that the that all microprocessor fillers are installed correctly. 4. Make sure that the that the front bezel on the blade server is not blocked. 5. (Trained service technician only) Make sure the heat sink installed in microprocessor socket *xx* is installed properly and has thermal grease applied to the bottom. 6. (Trained service technician only) Replace microprocessor *xx*.
Firmware (BIOS) backup ROM corruption, System board failure	1. Update the blade server firmware. 2. Replace the Blade Storage Expansion Unit 3.
Planar voltage fault (power 12V fault)	1. Remove the blade server from the BladeCenter unit; then, reinstall it. 2. (Trained service technician only) Replace the system board assembly.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error message	Action
Planar voltage fault (planar fault)	1. Remove the blade server from the BladeCenter unit; then, reinstall it. 2. (Trained service technician only) Replace the system board assembly.
Power controller timeout	1. Remove the blade server from the BladeCenter unit; then, reinstall it. 2. (Trained service technician only) Replace system board assembly.
Incompatible power controller firmware	(Trained service technician only) Replace system board assembly.
Blade incompatible with chassis	1. Make sure that the management-module firmware is at the latest level. 2. If the firmware is at latest level, the blade device is not supported by BladeCenter unit in which it is installed.
Firmware (BIOS) ROM corruption detected	Update the BIOS code.
Internal error CPU *xx* fault	Make sure that all of the software and the drivers are at the latest levels.
CPU *xx* over temperature	Make sure that the blade server is sufficiently cooled.
CPU *xx* fault	(Trained service technician only) Replace microprocessor *xx*.
CPU *xx* disabled	(Trained service technician only) Replace microprocessor *xx*.
Invalid CPU configuration	Make sure that microprocessors *xx* are supported and compatible.
CPU voltage regulator 5d fault	1. Remove the blade server from the BladeCenter unit; then, reinstall it. 2. (Trained service technician only) Replace the system board assembly.
Hard drive *xx* removal detected	Replace hard disk drive *xx*.
Hard drive *xx* fault	Information only. No action required.

POST error codes

The following table describes the POST error codes and suggested actions to correct the detected problems.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	

Error code	Description	Action

062	Three consecutive startup failures	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, make sure that the date and time are correct, and save the settings.
		2. Reseat the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Battery
		  b. (Trained service technician only) Microprocessor 1
		  c. (Trained service technician only) Microprocessor 2
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Battery
		  b. (Trained service technician only) Microprocessor 1
		  c. (Trained service technician only) Microprocessor 2
		  d. (Trained service technician only) System board assembly

101	Timer tick interrupt failure	(Trained service technician only) Replace the system board assembly.
102	Timer 2 test failure	(Trained service technician only) Replace the system board assembly.
106	Diskette controller failure	(Trained service technician only) Replace the system board assembly.

151	Real time clock failure	1. Reseat the battery.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Battery
		  b. (Trained service technician only) System board assembly

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action

161	Real-time clock battery failure	1. Run the Configuration/Setup Utility program.
		2. Reseat the battery.
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Battery
		  b. (Trained service technician only) System board assembly

162	Invalid configuration information or CMOS RAM checksum failure.	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.
		2. Reseat the battery.
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Battery
		  b. (Trained service technician only) System board assembly

163	Time of day not set.	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, make sure that the date and time are correct, and save the settings.
		2. Reseat the battery.
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Battery
		  b. (Trained service technician only) System board assembly

164	Memory size does not match CMOS.	1. Run the Configuration/Setup Utility program, make sure that the memory configuration is correct, and save the settings.
		2. Reseat the DIMMs.
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. DIMMs
		  b. (Trained service technician only) System board assembly

175	Bad EEPROM CRC #1	(Trained service technician only) Replace the system board assembly.
177	Bad checksum	(Trained service technician only) Replace the system board assembly.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
178	EEPROM not functional	(Trained service technician only) Replace the system board assembly.
184	Bad power-on password.	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings. 2. Reseat the battery. 3. (Trained service technician only) Replace the system board assembly.
185	Corrupted boot sequence	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings. 2. (Trained service technician only) Replace the system board assembly.
186	Security hardware control logic error	(Trained service technician only) Replace the system board assembly.
187	VPD Serial Number not set	(Trained service technician only) Replace the system board assembly.
188	Bad EEPROM CRC #2	(Trained service technician only) Replace the system board assembly.
189	Three attempts to enter the incorrect password.	Restart the blade server, run the Configuration/Setup Utility program, and change the power-on password.
196	Processor cache mismatch detected	Make sure that all of the installed microprocessors are of the same type and cache size. If they are not, replace one of the microprocessors with a microprocessor of the same type and cache size as the remaining installed microprocessor.
198	Processor speed mismatch detected	Make sure that all of the installed microprocessors are of the same type and speed. If they are not, replace one of the microprocessors with a microprocessor of the same type and speed as the remaining installed microprocessor.
199	Processor technology mismatch detected	Make sure that all of the installed microprocessors belong to the same family. If they are not, replace the microprocessors that has the wrong technology.
201	Base memory error or extended memory error.	1. Update the blade server firmware and restart the blade server. 2. Reseat the DIMMs. 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: a. DIMMs b. (Trained service technician only) System board assembly

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action

229	Internal cache (L2) error.	1. Reseat the following components:
		  a. (Trained service technician only) Microprocessor 1
		  b. (Trained service technician only) Microprocessor 2
		2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.

289	Memory error
	Note: The exact wording for this error varies. It may include a reference to the Advanced Memory Buffer (AMB). The AMB is part of the DIMM.
		1. Run the Configuration/Setup Utility program, disable the problem DIMMs under select **Advanced Setup -> Memory Settings**, and save the settings.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. DIMMs
		  b. (Trained service technician only) System board assembly

301	Keyboard failure.	1. If you have installed a USB keyboard, run the Configuration/Setup Utility program and enable keyboardless operation to prevent the POST error message 301 from being displayed during startup. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 3. (Trained service technician only) Replace the system board assembly.
303	Keyboard controller error.	(Trained service technician only) Replace the system board assembly.
602	Invalid diskette boot record.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 2. (Trained service technician only) Replace the system board assembly
604	Diskette drive failure.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 2. (Trained service technician only) Replace the system board assembly
662	Diskette drive configuration error.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 2. (Trained service technician only) Replace the system board assembly

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action

1200	Processor machine check.	1. Reseat the following components:
		   a. (Trained service technician only) Microprocessor 1
		   b. (Trained service technician only) Microprocessor 2
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		   a. (Trained service technician only) Microprocessor 1
		   b. (Trained service technician only) Microprocessor 2
		   c. (Trained service technician only) System board assembly

1762	Hard disk drive configuration has changed.	1. Run the Configuration/Setup Utility program, make sure that the hard disk drive configuration is correct, and save the settings.
		2. Reseat the hard disk drives.
		3. If blade expansion unit is installed, reseat it.
		4. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		   a. Hard disk drives
		   b. Blade expansion unit (if one is installed)
		   c. (Trained service technician only) System board assembly

1800	No more IRQs available.	1. Run the Configuration/Setup Utility program and make sure that interrupt resource settings are correct.
		2. Remove each I/O-expansion card one at a time, restarting the blade server each time, until the problem is isolated.
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		   a. Failed I/O-expansion card
		   b. (Trained service technician only) System board assembly

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action

18XX	PCI error.	1. Run the Configuration/Setup Utility program and make sure that interrupt resource settings are correct.
		2. Remove each I/O-expansion card one at a time, restarting the blade server each time, until the problem is isolated.
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Failed I/O-expansion card
		  b. (Trained service technician only) System board assembly

1962	Boot sector error, no operating system installed.	1. Make sure that a bootable operating system is installed.
		2. Run the SAS Attached Disk diagnostic test.
		3. Reseat the hard disk drive.
		4. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Hard disk drive
		  b. (Trained service technician only) System board assembly

5962	CD or DVD drive configuration error.	1. Run the Configuration/Setup Utility program, select **Load Default Settings**, and save the settings.
		2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102).
		3. Reseat the battery.
		4. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Battery
		  b. (Trained service technician only) System board assembly

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action

8603	Pointing device error.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102).
		2. Reseat the pointing device (mouse)
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Pointing device (mouse)
		  b. (Trained service technician only) System board assembly

I999301	Fixed disk boot sector error.	1. Reseat the hard disk drive.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Hard disk drive
		  b. (Trained service technician only) System board assembly

00012000	Processor machine check	1. Reseat the following components:
		  a. (Trained service technician only) Microprocessor 1
		  b. (Trained service technician only) Microprocessor 2
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. (Trained service technician only) Microprocessor 1
		  b. (Trained service technician only) Microprocessor 2
		  c. (Trained service technician only) System board assembly

000197xx	Processor Pxx failed BIST	1. (Trained service technician only) Reseat microprocessor xx
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. (Trained service technician only) Microprocessor xx
		  b. (Trained service technician only) System board assembly

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action

00150100	Multi-bit error occurred: forcing NMI DIMM=xx DIMM=yy (could not isolate)	1. Reseat DIMMs xx and yy
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. DIMMs xx and yy
		  b. (Trained service technician only) System board assembly

00150200	SERR: Address or specification. Cyc DPE Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	1. Reseat the I/O-expansion card in slot xx; then, restart the blade server.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. IO-expansion card in slot xx.
		  b. (Trained service technician only) System board assembly

00150300	SERR: Received target abort Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	1. Reseat the I/O-expansion card in slot xx; then, restart the blade server.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. IO-expansion card in slot xx.
		  b. (Trained service technician only) System board assembly

00150400	SERR: Device signaled SERR Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	1. Reseat the I/O-expansion card in slot xx; then, restart the blade server.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. IO-expansion card in slot xx.
		  b. (Trained service technician only) System board assembly

00150500	PERR: Master read parity error Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	1. Reseat the I/O-expansion card in slot xx; then, restart the blade server.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. IO-expansion card in slot xx.
		  b. (Trained service technician only) System board assembly

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
00150600	PERR: Primary write parity error Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	1. Reseat the I/O-expansion card in slot xx; then, restart the blade server. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: a. IO-expansion card in slot xx. b. (Trained service technician only) System board assembly
00150700	PERR: Secondary signaled parity error Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	1. Reseat the I/O-expansion card in slot xx; then, restart the blade server. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: a. IO-expansion card in slot xx. b. (Trained service technician only) System board assembly
00150900	SERR/PERR detected on PCI bus (no source found)	1. Reseat the I/O-expansion card in slot xx; then, restart the blade server. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: a. IO-expansion card in slot xx. b. (Trained service technician only) System board assembly
00151000	SERR: Signaled target abort Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	1. Reseat the I/O-expansion card in slot xx; then, restart the blade server. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: a. IO-expansion card in slot xx. b. (Trained service technician only) System board assembly
00151100	MCA: Recoverable error detected Processor=xx	1. (Trained service technician only) Reseat microprocessor xx 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: a. (Trained service technician only) Microprocessor xx b. (Trained service technician only) System board assembly

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action

00151200	MCA: Unrecoverable error detected processor=xx	1. (Trained service technician only) Reseat microprocessor xx
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. (Trained service technician only) Microprocessor xx
		  b. (Trained service technician only) System board assembly

00151300	MCA: Excessive recoverable error detected processor=xx	1. (Trained service technician only) Reseat microprocessor xx
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. (Trained service technician only) Microprocessor xx
		  b. (Trained service technician only) System board assembly

00151350	Processor machine check data A bank= xx APIC ID=xx CRS4=xxxx xxxx	Additional data for debug. Check error codes 00151100, 00151200, and 00151300 for action.
00151351	Processor machine check data B address= xxxx xxxx xxxx xxxx time stamp=xxxx xxxx xxxx xxxx	Additional data for debug. Check error codes 00151100, 00151200, and 00151300 for action.
00151352	Processor machine check data B status= xxxx xxxx xxxx xxxx	Additional data for debug. Check error codes 00151100, 00151200, and 00151300 for action. If bit 10 of Data b is set, do not replace CPU.

00151500	Excessive single bit errors detected DIMM=xx	1. Reseat DIMM xx
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. DIMM xx
		  b. (Trained service technician only) System board assembly

00151700	Started hot spare memory copy. Failed row/rows=xx and yy copied to spare row/rows=aa and bb	1. Reseat DIMM. See error code 00151500 to determine which DIMM to reseat or replace. 2. Reseat DIMM. See error code 00151500 to determine which DIMM to reseat or replace
00151710	Completed hot spare memory copy. Failed row/rows=xx and yy copied to spare row/rows=aa and bb	1. Reseat DIMM. See error code 00151500 to determine which DIMM to reseat or replace. 2. Reseat DIMM. See error code 00151500 to determine which DIMM to reseat or replace

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action

00151720	Parity error detected on processor bus.	1. Reseat the following components:
		  a. (Trained service technician only) Microprocessor 1
		  b. (Trained service technician only) Microprocessor 2
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. (Trained service technician only) Microprocessor 1
		  b. (Trained service technician only) Microprocessor 2
		  c. (Trained service technician only) System board assembly

00151730	CRC error	Reseat all memory DIMMs
00151801	Running from mirrored memory image	1. Reseat DIMM. See error code 00151500 to determine which DIMM to reseat or replace. 2. Replace DIMM. See error code 00151500 to determine which DIMM to reseat or replace.

01295085	ECC checking hardware test failed.	1. Reseat the following components:
		  a. (Trained service technician only) Microprocessor 1
		  b. (Trained service technician only) Microprocessor 2
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. (Trained service technician only) Microprocessor 1
		  b. (Trained service technician only) Microprocessor 2
		  c. (Trained service technician only) System board assembly

012980xx	The BIOS does not support the processor Pxx	1. Make sure the microprocessor xx is supported. 2. Update blade server firmware
012981xx	Unable to apply the microcode update for processor xx	1. Make sure the microprocessor xx is supported. 2. Replace microprocessor xx
I9990303	No boot devices found	Install operating system to hard disk drive.

Checkout procedure

The checkout procedure is the sequence of tasks that you should follow to diagnose a problem in the blade server.

About the checkout procedure

Before performing the checkout procedure for diagnosing hardware problems, review the following information:

- Read the safety information that begins on page vii.
- The diagnostic programs provide the primary methods of testing the major components of the blade server. If you are not sure whether a problem is caused by the hardware or by the software, you can use the diagnostic programs to confirm that the hardware is working correctly.
- When you run the diagnostic programs, a single problem might cause more than one error message. When this happens, correct the cause of the first error message. The other error messages usually will not occur the next time you run the diagnostic programs.

    Exception: If there are multiple error codes or light path diagnostics LEDs that indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See "Microprocessor problems" on page 82 for information about diagnosing microprocessor problems.

- If the blade server is halted and a POST error code is displayed, see "POST error codes" on page 67. If the blade server is halted and no error message is displayed, see "Troubleshooting tables" on page 79 and "Solving undetermined problems" on page 106.
- For intermittent problems, check the error log; see "POST" on page 57 and "Diagnostic programs, messages, and error codes" on page 94.
- If no LEDs are lit on the blade server front panel, verify the blade server status and errors in the management-module Web interface; also see "Solving undetermined problems" on page 106.
- If device errors occur, see "Troubleshooting tables" on page 79.

Performing the checkout procedure

To perform the checkout procedure, complete the following steps:

1. If the blade server is running, turn off the blade server.
2. Turn on the blade server. Make sure that the blade server has control of the video (the keyboard/video/mouse button is lit). If the blade server does not start, see "Troubleshooting tables" on page 79.
3. Record any POST beep codes that sound or POST error messages that are displayed on the monitor. If an error is displayed, look up the first error in the "POST error codes" on page 67.
4. Check the control panel blade-error LED; if it is lit, check the light path diagnostics LEDs (see "Light path diagnostics" on page 91).
5. Check for the following results:
    - Successful completion of POST, indicated by a single beep.
    - Successful completion of startup, indicated by a readable display of the operating-system desktop.

6. Did a single beep sound and are there readable instructions on the main menu?
   - **No:** Find the failure symptom in "Troubleshooting tables"; if necessary, see "Solving undetermined problems" on page 106.
   - **Yes:** Run the diagnostic programs (see "Running the diagnostic programs" on page 94).
     – If you receive an error, see "Diagnostic error codes" on page 97.
     – If the diagnostic programs were completed successfully and you still suspect a problem, see "Solving undetermined problems" on page 106.

Troubleshooting tables

Use the troubleshooting tables to find solutions to problems that have identifiable symptoms. If these symptoms relate to shared BladeCenter unit resources, see "Solving shared BladeCenter resource problems" on page 102.

If you cannot find the problem in these tables, see "Running the diagnostic programs" on page 94 for information about testing the blade server.

If you have just added new software or a new optional device, and the blade server is not working, complete the following steps before using the troubleshooting tables:

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

General problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
A cover lock is broken, an LED is not working, or a similar problem has occurred.	If the part is a CRU, replace it. If the part is a FRU, the part must be replaced by a trained service technician.

Hard disk drive problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
Not all drives are recognized by the Fixed Disk or SAS Attached Disk diagnostic test.	Reseat the drive that is indicated by the diagnostic tests; then, run the Fixed Disk or SAS Attached Disk diagnostic test again. If the drive still does not pass the diagnostic test, replace the drive with a new one.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	
Symptom	**Action**
The blade server stops responding during the Fixed Disk or SAS Attached Disk diagnostic test.	Reseat the hard disk drive that was being tested when the blade server stopped responding, and run the diagnostic test again. If the Fixed Disk or SAS Attached Disk diagnostic test fails, replace the drive that you removed with a new one.
A hard disk drive passes the Fixed Disk or SAS Attached Disk diagnostics test, but the problem remains.	Run the SAS Fixed Disk or SAS Attached Disk diagnostic test again. If the diagnostics continue to pass but the drive continues to have a problem, replace the drive with a new one.

Intermittent problems

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	
Symptom	**Action**

A problem occurs only occasionally and is difficult to diagnose.	1. Make sure that:
	  • When the blade server is turned on, air is flowing from the rear of the BladeCenter unit at the blower grille. If there is no airflow, the blower is not working. This causes the blade server to overheat and shut down.
	  • The SAS hard disk drives are configured correctly.
	2. Check the BMC log (see "Error logs" on page 62).
	3. See "Solving undetermined problems" on page 106.

Keyboard or mouse problems

The keyboard and mouse are shared BladeCenter unit resources. First, make sure that the keyboard and mouse are assigned to the blade server; then, see the following table and "Solving shared BladeCenter resource problems" on page 102.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	

Symptom	Action
All keyboard and mouse problems.	1. Make sure that the keyboard/video/mouse select button LED on the front of the blade server is lit, indicating that the blade server is connected to the shared keyboard and mouse. 2. See http://www.ibm.com/servers/eserver/serverproven/compat/us/ for keyboard and mouse compatibility. 3. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 4. Make sure that: • The latest firmware updates are installed (see "Firmware updates" on page "Firmware updates" on page 11). • The device drivers are installed correctly. • The keyboard and mouse are recognized as USB, not PS/2, devices by the blade server. Although the keyboard and mouse might be a PS/2-style devices, communication with them is through USB in the BladeCenter unit. Some operating systems allow you to select the type of keyboard and mouse during installation of the operating system. If this is the case, select USB. 5. (Trained service technician only) Replace the system board assembly.

Memory problems

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	

Symptom	Action
The amount of system memory that is displayed during POST or by the Configuration/Setup Utility program is less than the amount of installed physical memory	1. Make sure that: • You have installed the correct type of memory. • If you changed the memory, you updated the memory configuration in the Configuration/Setup Utility program. • All banks of memory are enabled. The blade server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled. 2. Check BMC log for error message 289: • If a DIMM was disabled by a system-management interrupt (SMI), replace the DIMM. • If a DIMM was disabled by the user or by POST, run the Configuration/Setup Utility program and enable the DIMM. 3. Reseat the DIMM. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: a. Replace the DIMM. b. (Trained service technician only) System board assembly

Microprocessor problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action

The blade server emits a continuous beep during POST, indicating that the startup (boot) microprocessor is not working correctly.	1. (Trained service technician only) Reseat microprocessor 1.
	2. (Trained service technician only) Remove microprocessor 2 and restart the server.
	    • If no beep code occurs, microprocessor 2 might have failed; replace the microprocessor.
	    • If the beep code remains, remove microprocessor 1 and install microprocessor 2 in the connector for microprocessor 1; then, restart the server. If no beep code occurs, microprocessor 1 might have failed; replace the microprocessor.
	3. (Trained service technician only) Replace microprocessor 1.

Monitor or video problems

The video monitor is a shared BladeCenter unit resource. First, make sure that the video monitor is assigned to the blade server; then, see the following table and "Solving shared BladeCenter resource problems" on page 102.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The screen is blank.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102).
	2. Make sure that:
	• Damaged BIOS code is not affecting the video; see "Recovering from a BIOS update failure" on page 101. **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 blade server three times to force the system BIOS to reset the memory connector or bank of connectors from Disabled to Enabled.
	• The device drivers are installed correctly.
	3. (Trained service technician only) Replace the system board assembly
The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102).
	2. (Trained service technician only) Replace the system board assembly.
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.
	2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102).
	3. (Trained service technician only) Replace the system board assembly.

Network connection problems

The blade server connects to the network using shared BladeCenter unit resources. See the following table and "Solving shared BladeCenter resource problems" on page 102.

Symptom	Action
• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.	
• See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.	
• If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.	
Symptom	**Action**
One or more blade servers are unable to communicate with the network.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 2. Make sure that: • The correct device drivers are installed. • The Ethernet controllers correctly configured. • Optional I/O-expansion cards are correctly installed and configured. 3. (Trained service technician only) Replace the system board assembly.

Optional-device problems

Symptom	Action
• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.	
• See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.	
• If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.	
Symptom	**Action**
An IBM optional device that was just installed does not work.	1. Make sure that: • The device is designed for the blade server (see http://www.ibm.com/servers/eserver/serverproven/compat/us/. • You followed the installation instructions that came with the device and the device is installed correctly. • You have not loosened any other installed devices or cables. • You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or any other device is changed, you must update the configuration. 2. If the device comes with its own test instructions, use those instructions to test the device. 3. Reseat the device that you just installed. 4. Replace the device that you just installed.

Power error messages

Power to the blade server is provided by shared BladeCenter unit resources. See the following table and "Solving shared BladeCenter resource problems" on page 102.

Message	Action
• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.** • **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.** • **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	
System Power Good fault	1. Reseat the blade server. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 3. (Trained service technician only) Replace the system board assembly.
VRD Power Good fault	1. Reseat the blade server. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 3. (Trained service technician only) Replace the system board assembly.
System over recommended voltage for +12v.	Informational only. **Note:** If problem persists, perform the following tasks. 1. Reseat the blade server. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102. 3. (Trained service technician only) Replace the system board assembly.
System over recommended voltage for +0.9v.	Informational only. **Note:** If problem persists, perform the following tasks. 1. Reseat the blade server. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102. 3. (Trained service technician only) Replace the system board assembly.
System over recommended voltage for +3.3v.	Informational only. **Note:** If problem persists, perform the following tasks. 1. Reseat the blade server. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102. 3. (Trained service technician only) Replace the system board assembly.
System over recommended 5V fault.	Informational only. **Note:** If problem persists, perform the following tasks. 1. Reseat the blade server. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102. 3. (Trained service technician only) Replace the system board assembly.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	

Message	Action
System under recommended voltage for +12v.	Informational only. **Note:** If problem persists, perform the following tasks. 1. Reseat the blade server. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102. 3. (Trained service technician only) Replace the system board assembly.
System under recommended voltage for +0.9v.	Informational only. **Note:** If problem persists, perform the following tasks. 1. Reseat the blade server. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102. 3. (Trained service technician only) Replace the system board assembly.
System under recommended voltage for +3.3v.	Informational only. **Note:** If problem persists, perform the following tasks. 1. Reseat the blade server. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102. 3. (Trained service technician only) Replace the system board assembly.
System under recommended 5V fault.	Informational only. **Note:** If problem persists, perform the following tasks. 1. Reseat the blade server. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102. 3. (Trained service technician only) Replace the system board assembly.

Power problems

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	

Symptom	Action
Power switch does not work.	1. Reseat the control-panel connector. 2. Replace the bezel assembly. 3. (Trained service technician only) Replace the system board assembly.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The blade server does not turn on.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 2. Make sure that the power-on LED on the blade server control panel is flashing slowly. • If the power LED is flashing rapidly and continues to do so, the blade server is not communicating with the management-module; reseat the blade server and go to step 7 • 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. 3. Check the power-management policies in the operating system for the blade server. 4. Check the management module log of the corresponding blade server for an error preventing the blade server from turning on. 5. Reseat the blade server. 6. If you just installed a device in the blade server, remove it and restart the blade server. If the blade server now starts, you might have installed more devices than the power to that blade bay supports. 7. (Trained service technician only) If you tried another blade server in the blade bay when checking the function of the shared BladeCenter unit resources and the other blade server worked, replace the system board assembly. 8. See "Solving undetermined problems" on page 106.
The blade server does not start and the following conditions are present: • The amber system-error LED on the BladeCenter unit system LED panel is lit. • The amber blade error LED on the blade server control panel is lit. • The management-module event log contains the message `Processor speed mismatch`.	1. Make sure that microprocessors 1 and 2 are identical (number of cores, cache size and type, clock speed, internal and external clock frequencies). 2. (Trained service technician only) If microprocessors are not identical, remove the microprocessor with the incorrect specifications and replace with a microprocessor that has the correct specifications.
The blade server turns off for no apparent reason.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 2. (Trained service technician only) If the microprocessor error LED is lit, replace the microprocessor. 3. (Trained service technician only) Replace the system board assembly.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	

Symptom	Action

The blade server does not turn off.	1. Verify whether you are using an Advanced Configuration and Power Interface (ACPI) or non-ACPI operating system.
	
	2. If you are using a non-ACPI operating system, complete the following steps:
	   a. Turn off the blade server by pressing the power-control button for 4 seconds.
	   b. If the blade server fails during POST and the power-control button does not work, remove the blade server from the bay and reseat it.
	
	3. If the problem remains or if you are using an ACPI-aware operating system, complete the following steps:
	   a. Check the power-management policies in the operating system for the blade server.
	   b. (Trained service technician only) Replace the system board assembly.

Removable-media drive problems

The removable-media (CD, DVD, or diskette) drives are shared BladeCenter unit resources. First, make sure that the drives are assigned to the blade server; then, see the following table and "Solving shared BladeCenter resource problems" on page 102.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	

Symptom	Action
All removable-media drive problems.	1. The media-tray select button LED on the front of the blade server is lit, indicating that the blade server is connected to the shared removable-media drives. 2. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 3. Run the Configuration/Setup Utility program and make sure that the drive is enabled. 4. For CD-ROM or DVD drive problems, make sure that the correct device driver is installed. 5. Reseat the battery. 6. Replace the battery. 7. (Trained service technician only) Replace the system board assembly

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The CD or DVD drive is detected as /dev/sr0 by SUSE Linux. (If the SUSE Linux operating system is installed remotely onto a blade server that is not the current owner of the media tray [CD or DVD drive, diskette drive, and USB port], SUSE Linux detects the CD or DVD drive as /dev/sr0 instead of /dev/cdrom.)	Establish a link between /dev/sr0 and /dev/cdrom as follows: 1. Enter the following command: `rm /dev/cdrom; ln -s /dev/sr0 /dev/cdrom` 2. Insert the following line in the /etc/fstab file: `/dev/cdrom /media/cdrom auto ro,noauto,user,exec 0 0`
The CD or DVD drive is not recognized after being switched back to the blade server running Windows 2000 Advanced Server with SP3 applied. (When the CD or DVD drive 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 or DVD drive. This happens when you have not safely stopped the drives before switching ownership of the media tray [CD or DVD drive, diskette drive, and USB port].)	**Note:** Because the BladeCenter unit uses USB to communicate with the media tray devices, switching ownership of the media tray to another blade server is the same as disconnecting a USB device. Before you switch ownership of the CD or DVD 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: 1. Double-click the **Unplug/Eject Hardware** icon in the Windows taskbar. 2. Select **USB Floppy** and click **Stop**. 3. Select **USB Mass Storage Device** and click **Stop**. 4. Click **Close**. You can now safely switch ownership of the media tray to another blade server.

ServerGuide problems

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Symptom	Action
The *ServerGuide Setup and Installation* CD will not start.	1. Make sure that the CD or DVD drive is associated with the blade server that you are configuring. 2. Make sure that the blade server supports the ServerGuide program. 3. If the startup (boot) sequence settings have been changed, make sure that the CD or DVD drives are first in the startup sequence.
The operating-system installation program continuously loops.	Make more space available on the hard disk.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	

Symptom	Action
The ServerGuide program will not start the operating-system CD.	Make sure that the operating-system CD is supported by the ServerGuide program. See the *ServerGuide Setup and Installation* CD label for a list of supported operating-system versions.
The operating system cannot be installed; the option is not available.	Make sure that the blade server supports the operating system. If it does, either no logical drive is defined (SAS RAID servers), or the ServerGuide System Partition is not present. Run the ServerGuide program and make sure that setup is complete.

Service processor problems

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	

Symptom	Action
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 blade server. If the problem remains, see "Solving undetermined problems" on page 106, and the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination and Service Guide* for your BladeCenter unit.

Software problems

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	

Symptom	Action

You suspect a software problem.	1. To determine whether the problem is caused by the software, make sure that:
	  • The blade server has the minimum memory that is needed to use the software. For memory requirements, see the information that comes with the software.
	    Note: If you have just installed an adapter or memory, the blade server might have a memory-address conflict.
	  • The software is designed to operate on the blade server.
	  • Other software works on the blade server.
	  • The software works on another server.
	2. If you received any error messages when using the software, see the information that comes with the software for a description of the messages and suggested solutions to the problem.
	3. Contact your place of purchase of the software.

Universal Serial Bus (USB) port problems

The USB ports are shared BladeCenter unit resources. First, make sure that the USB ports are assigned to the blade server; then, see the following table and "Solving shared BladeCenter resource problems" on page 102.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**	
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**	
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**	

Symptom	Action
A USB device does not work.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102).
	2. Make sure that:
	• The operating system supports USB devices.
	• The correct USB device driver is installed.
	3. (Trained service technician only) Replace the system board assembly.

Light path diagnostics

Light path diagnostics is a system of LEDs on the control panel and on various internal components of the blade server. When an error occurs, LEDs can be lit throughout the blade server to help identify the source of the error.

After you remove the blade server, you can press and hold the light path diagnostics switch for a maximum of 25 seconds to light the LEDs and locate the failing component. The following components have this feature:

- Hard disk drives
- Light path diagnostics panel
- Microprocessors
- Memory modules (DIMMs)

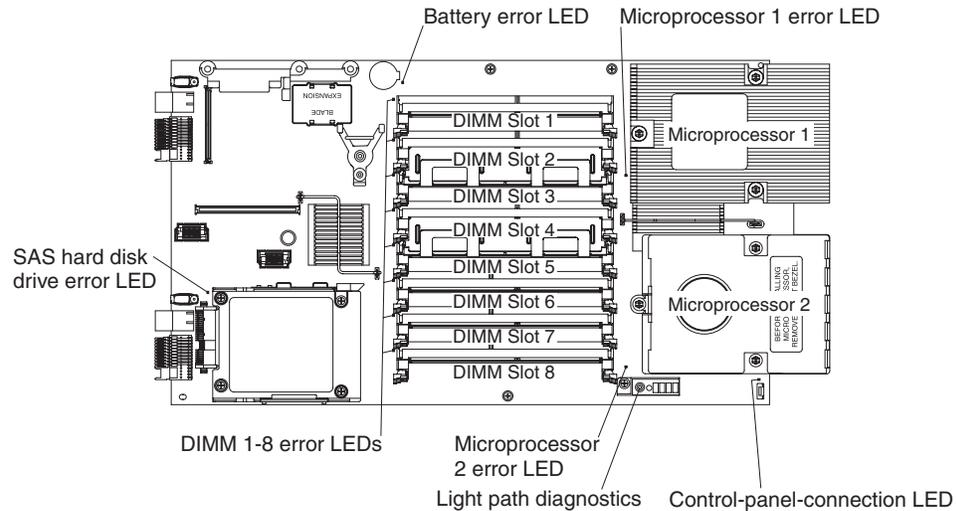# Viewing the light path diagnostics LEDs

Before working inside the blade server to view light path diagnostics LEDs, read the safety information that begins on page vii and "Installation guidelines" on page 21.

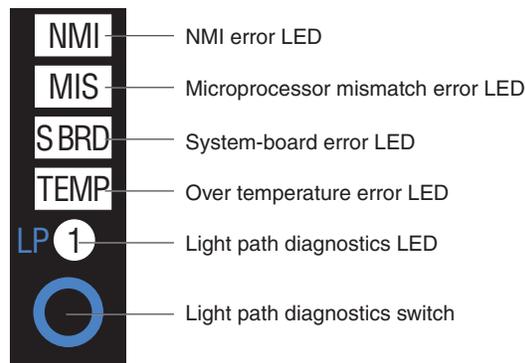If an error occurs, view the light path diagnostics LEDs in the following order:

1. Look at the control panel on the front of the blade server (see "Blade server controls and LEDs" on page 5).
   - If the information LED is lit, it indicates that information about a suboptimal condition in the blade server is available in the BMC log or in the management-module event log.
   - If the blade-error LED is lit, it indicates that an error has occurred; go to step 2.
2. To view the light path diagnostics panel and LEDs, complete the following steps:
   a. Remove the blade server from the BladeCenter unit.
   b. Place the blade server on a flat, static-protective surface.

c. Remove the cover from the blade server.

d. Press and hold the light path diagnostics switch to light the LEDs of the failing components in the blade server. The LEDs will remain lit for as long as you press the switch, to a maximum of 25 seconds.

The following illustration shows the locations of the system-board error LEDs and the system-board light path diagnostics panel.

Battery error LED   Microprocessor 1 error LED

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

Microprocessor 1

Microprocessor 2

SAS hard disk drive error LED

DIMM 1-8 error LEDs   Microprocessor 2 error LED

Light path diagnostics   Control-panel-connection LED

The following illustration shows LEDs on the system-board light path diagnostics panel.

NMI — NMI error LED

MIS — Microprocessor mismatch error LED

S BRD — System-board error LED

TEMP — Over temperature error LED

LP 1 — Light path diagnostics LED

— Light path diagnostics switch

When you press the light path diagnostics switch, note which LEDs are lit on the system board and light path diagnostics panel. Using this information and the information in "Light path diagnostics LEDs" on page 93 can often provide enough information to diagnose the error.

Light path diagnostics LEDs

The following table describes the LEDs on the light path diagnostics panel on the system board and suggested actions to correct the detected problems.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Lit light path diagnostics LED	Description	Action
None	An error has occurred and cannot be isolated, or the service processor has failed.	1. Make sure that the light path diagnostics LED is lit to ensure that there is enough power in the blade server to light the rest of the LEDs. 2. Check the BMC log for information about an error that is not represented by a light path diagnostics LED.
DIMM *x* error	A memory error occurred.	1. Make sure that DIMM *x* is supported. 2. Reseat the DIMM *x*. 3. Replace the DIMM *x*. **Note:** Multiple DIMM LEDs do not necessarily indicate multiple DIMM failures. If more than one DIMM LED is lit, reseat or replace one DIMM at a time until the error is corrected.
Light path diagnostics	The light path LEDs have power.	Check for error LEDs that are lit on the light path diagnostics panel and the system board assembly.
Microprocessor *x* error	Microprocessor *x* has failed.	1. Check the advanced management module (AMM) log for more information. Perform appropriate action. 2. If the log shows that a microprocessor is disabled or that a microprocessor IERR has occurred perform the following actions. a. (Trained service technician only) Reseat microprocessor *x*. b. (Trained service technician only) Replace microprocessor *x*.
MIS (Microprocessor mismatch)	The microprocessors do not match.	Make sure that microprocessors 1 and 2 are identical (number of cores, cache size and type, clock speed, internal and external clock frequencies); also, see "Troubleshooting tables" on page 79.
NMI (NMI error)	The system board has failed.	1. Replace the blade server cover, reinsert the blade server in the BladeCenter unit, and restart the blade server. Check the BMC log for information about the error. 2. (Trained service technician only) Replace the system board assembly.
S BRD (System board error)	The system board has failed	(Trained service technician only) Replace the system board assembly.

• **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**		
• **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**		
• **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**		

Lit light path diagnostics LED	Description	Action
TEMP (Over temperature error)	The system temperature has exceeded a threshold level.	1. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 102). 2. Make sure that the room temperature is not too high. See "Features and specifications" on page 4 for temperature information.
SAS hard disk drive error	The SAS hard disk drive has failed.	Run the SAS Fixed Disk or SAS Attached Disk diagnostic test. If the diagnostics pass but the drive continues to have a problem, replace the SAS hard disk drive with a new one.

Diagnostic programs, messages, and error codes

The diagnostic programs are the primary method of testing the major components of the blade server. As you run the diagnostic programs, text messages and error codes are displayed on the screen and are saved in the test log. A diagnostic text message or error code indicates that a problem has been detected; to determine what action you should take as a result of a message or error code, see the table in "Diagnostic error codes" on page 97.

If you cannot find the problem using the diagnostic programs, see "Solving undetermined problems" on page 106 for information about testing the blade server.

Running the diagnostic programs

To run the diagnostic programs, complete the following steps:

1. If the blade server is running, turn off the blade server.
2. Turn on the blade server.
3. When the prompt `F2 for Diagnostics` appears, press F2.
4. From the top of the screen, select either **Extended** or **Basic**.
5. From the menu, select the test that you want to run, and follow the instructions on the screen.

For help with the diagnostic programs, press F1. 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.

To determine what action you should take as a result of a diagnostic text message or error code, see the table in "Diagnostic error codes" on page 97.

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 your software.

A single problem might cause more than one error message. When this happens, correct the cause of the first error message. The other error messages usually will not occur the next time you run the diagnostic programs.

Exception: If there are multiple error codes or light path diagnostics LEDs that indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See "Microprocessor problems" on page 82 for information about diagnosing microprocessor problems.

If the blade server stops responding 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.

The diagnostic programs assume that a keyboard and mouse are attached to the BladeCenter unit and that the blade server controls them. 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 cannot use the **Next Cat** and **Prev Cat** buttons to select categories. All other mouse-selectable functions are available through function keys.

To view server configuration information such as system configuration, memory contents, interrupt request (IRQ) use, direct memory access (DMA) use, or device drivers, select **Hardware Info** from the top of the screen.

Diagnostic text messages

Diagnostic text messages are displayed while the tests are running. A diagnostic text message contains one of the following results:

Passed: The test was completed without any errors.

Failed: The test detected an error.

User Aborted: You stopped the test before it was completed.

Not Applicable: You attempted to test a device that is not present in the blade server.

Aborted: The test could not proceed because of the blade server configuration.

Warning: The test could not be run. There was no failure of the hardware that was being tested, but there might be a hardware failure elsewhere, or another problem prevented the test from running; for example, there might be a configuration problem, or the hardware might be missing or is not being recognized.

The result is followed by an error code or other additional information about the error.

Viewing the test log

To view the test log when the tests are completed, select **Utility** from the top of the screen and then select **View Test Log**. The test-log data is maintained only while you are running the diagnostic programs. When you exit from the diagnostic programs, the test log is cleared.

To save the test log to a file on a diskette or to the hard disk, select **Save Log** on the diagnostic programs screen and specify a location and name for the saved log file.

Note: 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 can contain other data.

Diagnostic error codes

The following table describes the error codes that the diagnostic programs might generate and suggested actions to correct the detected problems.

If the diagnostic programs generate error codes that are not listed in the table, make sure that the latest level of the BIOS code is installed.

In the error codes, *x* can be any numeral or letter. However, if the three-digit number in the central position of the code is 000, 195, or 197, *do not* replace a CRU or FRU. These numbers appearing in the central position of the code have the following meanings:

000   The blade server passed the test. Do not replace a CRU or FRU.

195   The Esc key was pressed to end the test. Do not replace a CRU or FRU.

197   This is a warning error, but it does not indicate a hardware failure; do not replace a CRU or FRU. Take the action that is indicated in the Action column, but *do not replace a CRU or a FRU*. See the description for **Warning** in the section "Diagnostic text messages" on page 96 for more information.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action

001-250-000	Failed processor board ECC.	1. Reseat the following components:
		  a. DIMMs
		  b. (Trained service technician only) Microprocessor 1.
		  c. (Trained service technician only) Microprocessor 2.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. DIMMs
		  b. (Trained service technician only) Microprocessor 1.
		  c. (Trained service technician only) Microprocessor 2.
		  d. (Trained service technician only) System board assembly

001-292-000	Core system: failed/CMOS checksum failed.	Load the BIOS default settings by using the Configuration/Setup Utility program and run the test again (see the *Installation and User's Guide* for your blade server).
001-xxx-000	Failed core tests.	(Trained service technician only) Replace the system board assembly.
001-xxx-001	Failed core tests.	(Trained service technician only) Replace the system board assembly.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
005-xxx-000	Failed video test.	(Trained service technician only) Replace the system board assembly.
030-xxx-000	Failed internal SAS interface test.	(Trained service technician only) Replace the system board assembly.
035-xxx-099	No adapters were found.	Reseat the adapter (if installed).
075-xxx-000	Failed power supply test.	Replace the power module (see the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination and Service Guide* for your BladeCenter unit).

089-xxx-00n	Failed microprocessor test.	1. Reseat the following components:
		  a. (Trained service technician only) Microprocessor 1 if $n = 0$ or 6.
		  b. (Trained service technician only) Microprocessor 2 if $n = 1$ or 7.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. (Trained service technician only) Microprocessor 1 if $n = 0$ or 6
		  b. (Trained service technician only) Microprocessor 2 if $n = 1$ or 7
		  c. (Trained service technician only) System board assembly

165-060-000	Service Processor: ASM may be busy	1. Rerun the diagnostics test. 2. Correct other error conditions that might be keeping the Advanced System Management (ASM) network or components busy. See the error log and diagnostic panel. 3. Turn off the blade server and reseat it in the BladeCenter unit. 4. (Trained service technician only) Replace the system board assembly.
165-198-000	Service Processor: Aborted	1. Rerun the diagnostics test. 2. Correct other error conditions that might be keeping the Advanced System Management (ASM) network or components busy. See the error log and diagnostic panel. 3. Turn off the blade server and reseat it in the BladeCenter unit. 4. (Trained service technician only) Replace the system board assembly.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
165-201-000	Service Processor: Failed	1. Power down blade server and reseat it in the chassis. 2. (Trained service technician only) Replace the system board assembly.
165-330-000	Service Processor: Failed	Update the ROM diagnostic to the latest level and run the diagnostics again.
165-342-000	Service Processor: Failed	1. Make sure that the latest firmware levels for Advanced System Management (ASM) and BIOS are installed. 2. Turn off the blade server and reseat it in the BladeCenter unit. 3. (Trained service technician only) Replace the system board assembly.
166-406-001	System Management: Failed (BMC indicates failure in I2C bus test)	Shutdown and remove the blade server from the BladeCenter unit, wait 30 seconds; then, reinstall the blade server in the BladeCenter unit and restart it. If problem persists, perform the following tasks in the order shown, restarting the blade server each time: 1. Update the BMC firmware. 2. (Trained service technician only) Replace the system board assembly.
166-407-001	System Management: Failed. BMC indicates failure in I2C bus test.	Shutdown and remove the blade server from the BladeCenter unit, wait 30 seconds; then, reinstall the blade server in the BladeCenter unit and restart it. If problem persists, perform the following tasks in the order shown, restarting the blade server each time: 1. Update the BMC firmware. 2. (Trained service technician only) Replace the system board assembly.
166-nnn-001	System Management: Failed. BMC indicates failure in self test. **Note:** - nnn = 300 to 320 - nnn = 400 to 420, excluding 406 and 407	1. Remove the blade server from the BladeCenter unit, wait 30 seconds, reseat it in the BladeCenter unit, and run the test again. 2. Update the BMC firmware (see "Firmware updates" on page 11). 3. (Trained service technician only) Replace the system board assembly.
180-xxx-000	Diagnostics LED failure.	Run the LED test in the diagnostics program.
180-xxx-001	Failed front LED panel test.	1. Reseat the control-panel connector. 2. Replace the bezel assembly. 3. (Trained service technician only) Replace the system board assembly.
180-xxx-002	Failed diagnostics LED panel test.	(Trained service technician only) Replace the system board assembly.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 3, "Parts listing, Type 1915 and 7995," on page 15 to determine which components are CRUs and which components are FRUs.**
- **If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician.**

Error code	Description	Action
180-xxx-003	Failed system board LED test.	(Trained service technician only) Replace the system board assembly.

201-xxx-0nn	Failed memory test.
	Note: nn = DIMM slot number, 01 to 08
		1. Reseat the DIMM *nn* in the indicated slot.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. DIMM *nn* in indicated slot
		  b. (Trained service technician only) System board assembly

201-xxx-n99	Multiple DIMM failure, see error text. **Note:** n = number of failing pair; see "Installing a memory module" on page 37.	1. See the error text for failing DIMMs. 2. (Trained service technician only) System board assembly

202-xxx-00n	Failed system cache test.
	Note: n = microprocessor 1 or microprocessor 2.
		1. Reseat microprocessor *n*.
		2. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. (Trained service technician only) Microprocessor *n*
		  b. (Trained service technician only) System board assembly

217-198-xxx	Could not establish drive parameters.	1. Reseat hard disk drive *x*.
		2. Update the BIOS code.
		3. Replace the following components one at a time, in the order shown, restarting the blade server each time:
		  a. Hard disk drive *x*
		  b. (Trained service technician only) System board assembly

217-xxx-000	Failed hard disk drive test. **Note:** If RAID is configured, the SAS Attached Disk number refers to the RAID logical drive.	1. Reseat hard disk drive 1. 2. Replace hard disk drive 1.
217-xxx-001	Failed hard disk drive test. **Note:** If RAID is configured, the SAS Attached Disk number refers to the RAID logical drive.	1. Reseat hard disk drive 2. 2. Replace hard disk drive 2.
405-xxx-000	Failed Ethernet test on controller on the system board.	1. Make sure that Ethernet is not disabled in the Configuration/Setup Utility program. 2. (Trained service technician only) Replace the system board assembly.

Recovering from a BIOS update failure

The blade server has an advanced recovery feature that will automatically switch to a backup BIOS page if the BIOS code in the blade server has become damaged, such as from a power failure during an update.

The flash memory of the blade server consists of a primary page and a backup page. If the BIOS code in the primary page is damaged, the baseboard management controller will detect the error and automatically switch to the backup page to start the blade server. If this happens, a POST message `Booted from backup POST/BIOS image` is displayed. The backup page version may not be the same version as the primary image.

You can then recover or restore the original primary page BIOS by using a BIOS flash diskette.

To recover the BIOS code and restore the blade server operation to the primary page, complete the following steps:

1. Download the latest version of the BIOS code from http://www.ibm.com/systems/support/.
2. Update the BIOS code, following the instructions that come with the update file that you downloaded. This will automatically restore and update the primary page.
3. Restart the blade server.

If that procedure fails, the blade server might not restart correctly or might not display video. To manually restore the BIOS code, complete the following steps:

1. Read the safety information that begins on page vii and "Installation guidelines" on page 21.
2. Turn off the blade server.
3. Remove the blade server from the BladeCenter unit (see "Removing the blade server from a BladeCenter unit" on page 24).
4. Remove the cover (see "Removing the blade server cover" on page 27).
5. Locate switch block SW3 on the system board (see "System board switches" on page 8).
6. Move the BIOS backup page switch (SW3-1) to the ON position to enable the backup page.
7. Replace the cover and reinstall the blade server in the BladeCenter unit, making sure that the media tray is selected by the relevant blade server.
8. Insert the BIOS flash diskette into the media tray diskette drive.
9. Restart the blade server. The system begins the power-on self-test (POST).
10. Select **1 - Update POST/BIOS** from the menu that contains various flash (update) options.

    Attention: Do *not* type Y when you are prompted to back up the ROM location; doing so causes the damaged BIOS to be copied into the backup page.
11. When you are prompted whether you want to move the current POST/BIOS image to the backup ROM location, type N.
12. When you are prompted whether you want to save the current code to a diskette, type N.
13. Select **Update the BIOS**.

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

14. When the update is complete, remove the flash diskette from the diskette drive.
15. Turn off the blade server and remove it from the BladeCenter unit.
16. Remove the cover of the blade server.
17. Move switch SW3-1 to OFF to return to the normal startup mode.
18. Replace the cover and reinstall the blade server in the BladeCenter unit.
19. Restart the blade server.

Service processor (BMC) error codes

The baseboard management controller (BMC) log contains up to 512 of the most recent service processor errors in IPMI format. These messages are a combination of plain text and error code numbers. You can view the BMC log from the Configuration/Setup Utility menu by selecting **Advanced Setup → Baseboard Management Controller (BMC) Settings → BMC System Event Log**.

You can view additional information and error codes in plain text by viewing the management-module event log in your BladeCenter unit.

Solving SAS hard disk drive problems

For any SAS error message, one or more of the following devices might be causing the problem:
- A failing SAS device (adapter, drive, or controller)
- An improper SAS configuration

For any SAS error message, make sure that the SAS devices are configured correctly.

Solving shared BladeCenter resource problems

Problems with BladeCenter shared resources might appear to be in the blade server. The following sections provide procedures to help you isolate blade server problems from shared BladeCenter resource problems. If the problem is thought to be with a shared resource, see the *Problem Determination and Service Guide* or the *Hardware Maintenance Manual and Troubleshooting Guide* for your BladeCenter unit and other BladeCenter component documentation for additional information. If the problem cannot be solved, see "Solving undetermined problems" on page 106.

To check the general function of shared BladeCenter resources, complete the following operations:
- Make sure that:
  - The BladeCenter unit has the required power modules installed and is connected to a working power source.
  - Power management has been correctly set for your BladeCenter unit configuration.
- Check if the problem is being experienced with more than one blade server. Perform a test of the function on a known-good blade server.
- Try the blade server in a different blade bay.
- Try a known-good blade server in the blade bay.

Keyboard or mouse problems

To check for keyboard or mouse problems, complete the following steps until the problem is solved:

1. Make sure that:
   - Both the blade server and the monitor are turned on.
   - The keyboard/video/mouse select button LED on the front of the blade server is lit, indicating that the blade server is connected to the shared keyboard and mouse.
   - The keyboard or mouse cable is securely connected to the active BladeCenter management-module.
   - The keyboard or mouse works with another blade server.

2. Check for correct management-module operation (see the documentation for your BladeCenter unit).

   Note: Some BladeCenter unit types have several management-module components that might need to be tested or replaced (see the *Installation Guide* for your management module for more information).

3. Replace the keyboard or mouse.

4. Replace the management module (see the documentation for your BladeCenter unit).

If these steps do not resolve the problem, it is likely a problem with the blade server. See "Keyboard or mouse problems" on page 80.

Media tray problems

To check for problems with the media tray (removable media drives and USB ports), complete the following steps until the problem is solved:

1. Make sure that:
   - The media-tray select button LED on the front of the blade server is lit, indicating that the blade server is connected to the shared media tray.
   - The media tray devices work with another blade server.

2. Check if the problem affects more than one media tray component:
   - USB ports
   - Diskette drive
   - CD or DVD drive

3. For problems affecting only a USB port:
   a. Make sure that the USB device is operational. If using a USB hub, make sure that the hub is operating correctly and that any software the hub requires is installed. Plug the USB device directly into the USB port, bypassing the hub, to check its operation.
   b. Reseat the following components:
      1) USB device cable
      2) Media tray cable (if applicable)
      3) Media tray
   c. Replace the following components one at a time, in the order shown, restarting the blade server each time:
      1) USB cable (if applicable)
      2) Media tray cable (if applicable)
      3) Media tray
   d. Continue with step 7 on page 104.

4. For problems affecting only the diskette drive:
   a. If there is a diskette in the drive, make sure that:
      - The diskette is inserted correctly in the drive.
      - The diskette is good and not damaged; the drive LED light flashes once per second when the diskette is inserted. (Try another diskette if you have one.)
      - The diskette contains the necessary files to start the blade server.
      - The software program is working properly.
      - The distance between monitors and diskette drives is at least 76 mm (3 in.).
   b. Continue with step 6.
5. For problems affecting only the CD or DVD drive:
   a. Make sure that:
      - The CD or DVD is inserted correctly in the drive. If necessary, insert the end of a straightened paper clip into the manual tray-release opening to eject the CD or DVD. The drive LED light flashes once per second when the CD or DVD is inserted.
      - The CD or DVD is clean and not damaged. (Try another CD or DVD if you have one.)
      - The software program is working properly.
   b. Continue with step 6.
6. For problems affecting one or more of the removable media drives:
   a. Reseat the following components:
      1) Removable-media drive cable (if applicable)
      2) Removable-media drive
      3) Media tray cable (if applicable)
      4) Media tray
   b. Replace the following components one at a time, in the order shown, restarting the blade server each time:
      1) Removable-media drive cable (if applicable)
      2) Media tray cable (if applicable)
      3) Removable-media drive
      4) Media tray
   c. Continue with step 7.
7. Check for correct management-module operation (see the documentation for your BladeCenter unit).

   Note: Some BladeCenter unit types have several management-module components that might need to be tested or replaced (see the *Installation Guide* for your management module for more information).
8. Replace the management module (see the documentation for your BladeCenter unit).

If these steps do not resolve the problem, it is likely a problem with the blade server. See "Removable-media drive problems" on page 88 or "Universal Serial Bus (USB) port problems" on page 91.

Network connection problems

To check for network connection problems, complete the following steps until the problem is solved:

1. Make sure that:
   - The network cables are securely connected to the I/O module.
   - Power configuration of the BladeCenter unit supports the I/O module configuration.
   - Installation of the I/O-module type is supported by the BladeCenter unit and blade server hardware.
   - The I/O modules for the network interface that is being used are installed in the correct BladeCenter bays, and are configured and operating correctly.
   - The settings in the I/O module are correct for the blade server (settings in the I/O module are specific to each blade server).

2. Check for correct I/O-module operation; troubleshoot and replace the I/O module as indicated in the documentation for the I/O module.

3. Check for correct management-module operation (see the documentation for your BladeCenter unit).

   Note: Some BladeCenter unit types have several management-module components that might need to be tested or replaced (see the *Installation Guide* for your management module for more information).

4. Replace the management module (see the documentation for your BladeCenter unit).

If these steps do not resolve the problem, it is likely a problem with the blade server. See "Network connection problems" on page 84.

Power problems

To check for power problems, make sure that:

- The LEDs on all the BladeCenter power modules are lit.
- Power is being supplied to the BladeCenter unit.
- Installation of the blade server type is supported by the BladeCenter unit.
- The BladeCenter unit has the correct power configuration to operate the blade bay where your blade server is installed (see the documentation for your BladeCenter unit).
- The BladeCenter unit power management configuration and status support blade server operation (see the *Management Module User's Guide* or the *Management Module Command-Line Interface Reference Guide* for information).
- Local power control for the blade server is correctly set (see the *Management Module User's Guide* or the *Management Module Command-Line Interface Reference Guide* for information).
- The BladeCenter unit blowers are correctly installed and operational.

If these operations do not solve the problem, it is likely a problem with the blade server. See "Power error messages" on page 85 and "Power problems" on page 86.

Video problems

To check for video problems, complete the following steps until the problem is solved:

1. Make sure that:
   - Both the blade server and the monitor are turned on, and that the monitor brightness and contrast controls are correctly adjusted.
   - The keyboard/video/mouse select button LED on the front of the blade server is lit, indicating that the blade server is connected to the shared BladeCenter monitor.
   - The video cable is securely connected to the BladeCenter management-module. Non-IBM monitor cables might cause unpredictable problems.
   - The monitor works with another blade server.
   - Some IBM monitors have their own self-tests. If you suspect a problem with the monitor, see the information that comes with the monitor for instructions for adjusting and testing the monitor. If the monitor self-tests show that the monitor is working correctly, 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.

      Attention: Moving a color monitor while it is turned on might cause screen discoloration.

      Move the device and the monitor at least 305 mm (12 in.) apart. Turn on the monitor. To prevent diskette drive read/write errors, make sure that the distance between the monitor and any diskette drive is at least 76 mm (3 in.).

2. Check for correct management-module operation (see the documentation for your BladeCenter unit).

   Note: Some BladeCenter unit types have several management-module components that might need to be tested or replaced (see the *Installation Guide* for your management module for more information).

3. Replace the monitor cable, if applicable.
4. Replace the monitor.
5. Replace the management module (see the documentation for your BladeCenter unit).

If these steps do not resolve the problem, it is likely a problem with the blade server. See "Monitor or video problems" on page 83.

Solving undetermined problems

Note: When you are diagnosing a problem in the blade server, you must determine whether the problem is in the blade server or in the BladeCenter unit.

- If all of the blade servers have the same symptom, the problem is probably in the BladeCenter unit. For more information, see the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination and Service Guide* for your BladeCenter unit.

- If the BladeCenter unit contains more than one blade server and only one of the blade servers has the problem, troubleshoot the blade server that has the problem.

If the diagnostic tests did not diagnose the failure or if the blade server is inoperative, use the information in this section.

If you suspect that a software problem is causing failures (continuous or intermittent), see "Software problems" on page 90.

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, remove and replace the battery to override the power-on password and clear the CMOS memory; see "Removing the battery" on page 48. If you suspect that the BIOS code is damaged, see "Recovering from a BIOS update failure" on page 101.

Check the LEDs on all the power supplies of the BladeCenter unit in which the blade server is installed. If the LEDs indicate that the power supplies are working correctly and reseating the blade server does not correct the problem, complete the following steps:
1. Make sure that the control panel connector is correctly seated on the system board (see "System board connectors" on page 8 for the location of the connector).
2. If no LEDs on the control panel are working, replace the bezel assembly; then, try to turn on the blade server from the management module (see the documentation for the BladeCenter unit and management module for more information).
3. Turn off the blade server.
4. Remove the blade server from the BladeCenter unit 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-expansion card
   • Hard disk drives
   • Memory modules. The minimum configuration requirement is 1 GB (two 512 MB DIMMs on the system board).

   The following minimum configuration is required for the blade server to start:
   • System board
   • One microprocessor
   • Two 512 MB DIMMs
   • A functioning BladeCenter unit
6. Install and turn on the blade server. If the problem remains, suspect the following components in the following order:
   a. DIMM
   b. System board
   c. Microprocessor

If the problem is solved when you remove an I/O-expansion card from the blade server but the problem recurs when you reinstall the same card, suspect the I/O-expansion card; if the problem recurs when you replace the card with a different one, suspect the system board.

If you suspect a networking problem and the blade server passes all the system tests, suspect a network cabling problem that is external to the system.

Problem determination tips

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

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

Note: To eliminate confusion, identical systems are considered identical only if they:
  1. Are the exact machine type and models
  2. Have the same BIOS level
  3. Have the same adapters/attachments in the same locations
  4. Have the same address jumpers/terminators/cabling
  5. Have the same software versions and levels
  6. Have the same diagnostics code (version)
  7. Have the same configuration options set in the system
  8. Have the same setup for the operation system control files

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

Calling IBM for service

See Appendix A, "Getting help and technical assistance," on page 111 for information about calling IBM for service.

When you call for service, have as much of the following information available as possible:

- Machine type, model and serial number
- Management-module service data information (see the documentation for your BladeCenter unit management module).
- Microprocessor and hard disk drive upgrades
- Failure symptoms

- – Does the BMC error log report any errors? If so, what are the errors?
- – Does the blade server fail the diagnostic programs? If so, what are the error codes?
- – What occurs? When? Where?
- – Is the failure repeatable?
- – Has the current server configuration ever worked?
- – What changes, if any, were made before it failed?
- – Is this the original reported failure, or has this failure been reported before?
- Diagnostic program type and version level
- Hardware configuration (print screen of the system summary)
- BIOS code level
- Operating-system type and version level

You can solve some problems by comparing the configuration and software setups between working and nonworking servers. When you compare servers to each other for diagnostic purposes, consider them identical only if all the following factors are exactly the same in all the blade servers:

- Machine type and model
- BIOS level
- Adapters and attachments, in the same locations
- Address jumpers, terminators, and cabling
- Software versions and levels
- Diagnostic program type and version level
- Configuration option settings
- Operating-system control-file setup

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 section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your 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 and any optional devices are 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 *Problem Determination and Service Guide* on the IBM *Documentation* CD that comes with your system.
- Go to the IBM support Web site at http://www.ibm.com/systems/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 documentation that is provided with your IBM product. The documentation that comes with IBM systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/systems/support/ and follow the instructions. Also, some documents are available through the IBM Publications Center at http://www.ibm.com/shop/publications/order/.

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 systems, optional devices, services, and support. The address for IBM System x® and xSeries® information is http://www.ibm.com/systems/x/. The address for IBM BladeCenter information is http://www.ibm.com/systems/bladecenter/. The address for IBM IntelliStation® information is http://www.ibm.com/intellistation/.

You can find service information for IBM systems and optional devices at
http://www.ibm.com/systems/support/.

Software service and support

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

For more information about Support Line and other IBM services, see
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台灣 IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路 7 號 3 樓
電話：0800-016-888

IBM Taiwan product service contact information:
    IBM Taiwan Corporation
    3F, No 7, Song Ren Rd.
    Taipei, Taiwan
    Telephone: 0800-016-888

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When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

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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 that are available from IBM.

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L'etiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

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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/index.shtml or contact your local waste disposal facility.

In the United States, IBM has established a return 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.

For Taiwan: Please recycle batteries.

For the European Union:
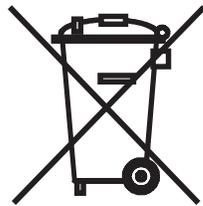
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Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Les batteries ou emballages pour batteries sont étiquetés conformément aux directives européennes 2006/66/EC, norme relative aux batteries et accumulateurs en usage et aux batteries et accumulateurs usés. Les directives déterminent la marche à suivre en vigueur dans l'Union Européenne pour le retour et le recyclage des batteries et accumulateurs usés. Cette étiquette est appliquée sur diverses batteries pour indiquer que la batterie ne doit pas être mise au rebut mais plutôt récupérée en fin de cycle de vie selon cette norme.

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池の回収とリサイクルの骨子を定めているもので、EU 諸国にわたって適用されます。
このラベルは、使用済みになったときに指令に従って適正な処理をする必要があること
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In accordance with the European Directive 2006/66/EC, batteries and accumulators
are labeled to indicate that they are to be collected separately and recycled at end
of life. The label on the battery may also include a chemical symbol for the metal
concerned in the battery (Pb for lead, Hg for mercury, and Cd for cadmium). Users
of batteries and accumulators must not dispose of batteries and accumulators as
unsorted municipal waste, but use the collection framework available to customers
for the return, recycling, and treatment of batteries and accumulators. Customer
participation is important to minimize any potential effects of batteries and
accumulators on the environment and human health due to the potential presence
of hazardous substances. For proper collection and treatment, contact your local
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This notice is provided in accordance with Royal Decree 106/2008 of Spain: The
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environmental management of their waste.

For California:

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hazardouswaste/perchlorate/.

The foregoing notice is provided in accordance with California Code of Regulations
Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate
Materials. This product/part may include a lithium manganese dioxide battery which
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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
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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 2004/108/EC 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.

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

European Community contact:
    IBM Technical Regulations
    Pascalstr. 100, Stuttgart, Germany 70569
    Telephone: 0049 (0)711 785 1176
    Fax: 0049 (0)711 785 1283
    E-mail: tjahn@de.ibm.com

Taiwanese Class A warning statement

警告使用者:
這是甲類的資訊產品,在
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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

中华人民共和国 "A类" 警告声明

声 明
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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、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。　　　　　　　　　　VCCI-A

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