BladeCenter HS22V
Type 7871 and 1949

Problem Determination and Service Guide

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Type 7871 and 1949

Problem Determination and Service Guide

Note

Before using this information and the product it supports, read the general information in "Notices" on page 229, the *Warranty Information* document, the *IBM Safety Information*, and *IBM Systems Environmental Notices and User Guide* documents on the IBM *Documentation* CD.

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

Thirteenth Edition (July 2014)

Contents

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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.

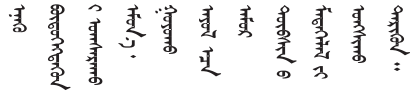
A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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.

ཐོན་རྫས་འདི་བདེ་སྒྲུབ་མ་བྱས་གོང་། ་སྐོར་གྱི་ཡིད་གཟབ་
བྱ་འདུ་མིན་ཡོད་པའི་འདོད་སྐེར་བཤུ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

ماۋزكۇر ماھسۇلاتنى ئورنىتىشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

Youq mwngz yungh canjbinj neix gaxgonq, itdingh aeu doeg aen
canjbinj soengq cungj vahgangj ancien siusik.

Guidelines for trained service technicians

This section contains information for trained service technicians.

Inspecting for unsafe conditions

Use this information to help you identify potential unsafe conditions in an IBM® product that you are working on.

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 optional devices 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 cords are disconnected.
2. Make sure that the exterior cover is not damaged, loose, or broken, and observe any sharp edges.
3. Check the power cords:
   - 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 cords are the correct 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 system 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 these guidelines when you service electrical equipment.

- Check the area for electrical hazards such as moist floors, nongrounded 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 work 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 you use 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 you measure 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

These statements provide the caution and danger information that is used in this documentation.

Important:

Each caution and danger statement in this documentation is labeled 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 is labeled `Statement 1`, translations for that caution statement are in the *Safety Information* document under `Statement 1`.

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

Statement 1

DANGER

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

To avoid a shock hazard:

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

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

Statement 2

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

Do not:

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

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

Statement 3

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

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

DANGER

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

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

Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil À Laser de Classe 1

Statement 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 12

CAUTION:
The following label indicates a hot surface nearby.

Statement 13

DANGER

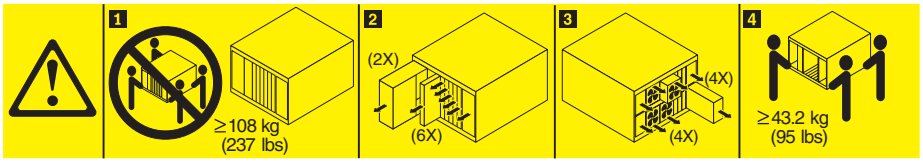
Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your device for electrical specifications.

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.

Statement 32

CAUTION:
To avoid personal injury, before lifting the unit, remove all the blades, power supplies, and removable modules to reduce the weight.



Statement 33

CAUTION:
This device does not provide a power control button. Removing power supply modules or turning off the server blades does 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.

Rack Safety Information, Statement 2

DANGER

- **Always lower the leveling pads on the rack cabinet.**
- **Always install stabilizer brackets on the rack cabinet.**
- **Always install servers and optional devices starting from the bottom of the rack cabinet.**
- **Always install the heaviest devices in the bottom of the rack cabinet.**

UL regulatory information

This device is for use only with Listed chassis.

Chapter 1. Start here

You can solve many problems without outside assistance by following the troubleshooting procedures in this documentation and on the World Wide Web.

This document describes the diagnostic tests that you can perform, troubleshooting procedures, and explanations of error messages and error codes. The documentation that comes with your operating system and software also contains troubleshooting information.

Diagnosing a problem

Before you contact IBM or an approved warranty service provider, follow these procedures in the order in which they are presented to diagnose a problem with your blade server.

1. **Return the server to the condition it was in before the problem occurred.** If any hardware, software, or firmware was changed before the problem occurred, if possible, reverse those changes. This might include any of the following items:
   - Hardware components
   - Device drivers and firmware
   - System software
   - UEFI firmware
   - System input power or network connections
2. **View the light path diagnostics LEDs and event logs.** The blade server is designed for ease of diagnosis of hardware and software problems.
   - **Light path diagnostics LEDs:** See “Light path diagnostics” on page 181 for information about using light path diagnostics LEDs.
   - **Event logs:** See “Error logs” on page 99 for information about notification events and diagnosis.
   - **Software or operating-system error codes:** See the documentation for the software or operating system for information about a specific error code. See the manufacturer's website for documentation.
3. **Run IBM Dynamic System Analysis (DSA) and collect system data.** Run Dynamic System Analysis (DSA) to collect information about the hardware, firmware, software, and operating system. Have this information available when you contact IBM or an approved warranty service provider. For instructions for running DSA, see the *Dynamic System Analysis Installation and User's Guide*.

   To download the latest version of DSA code and the *Dynamic System Analysis Installation and User's Guide*, go to http://www.ibm.com/support/entry/portal/docdisplay?lndocid=SERV-DSA.
4. **Check for and apply code updates.** Fixes or workarounds for many problems might be available in updated UEFI firmware, device firmware, or device drivers. To display a list of available updates for the blade server, go to http://www.ibm.com/support/fixcentral.

   Attention: Installing the wrong firmware or device-driver update might cause the blade server to malfunction. Before you install a firmware or device-driver

update, read any readme and change history files that are provided with the downloaded update. These files contain important information about the update and the procedure for installing the update, including any special procedure for updating from an early firmware or device-driver version to the latest version.

Important: Some cluster solutions require specific code levels or coordinated code updates. If the device is part of a cluster solution, verify that the latest level of code is supported for the cluster solution before you update the code.

a. **Install UpdateXpress system updates.** You can install code updates that are packaged as an UpdateXpress System Pack or UpdateXpress CD image. An UpdateXpress System Pack contains an integration-tested bundle of online firmware and device-driver updates for your blade server. In addition, you can use IBM ToolsCenter Bootable Media Creator to create bootable media that is suitable for applying firmware updates and running preboot diagnostics. For more information about UpdateXpress System Packs, see http://www.ibm.com/support/entry/portal/docdisplay?lndocid=SERV-XPRESS . For more information about the Bootable Media Creator, see http://www.ibm.com/support/entry/portal/docdisplay?lndocid=TOOL-BOMC.

   Be sure to separately install any listed critical updates that have release dates that are later than the release date of the UpdateXpress System Pack or UpdateXpress image (see step 4b).

b. **Install manual system updates.**

   1) **Determine the existing code levels.**

      From the advanced management module web interface, click **Monitors** and then click **Firmware VPD**.

      In DSA, click **Firmware/VPD** to view system firmware levels, or click **Software** to view operating-system levels.

   2) **Download and install updates of code that is not at the latest level.**

      To display a list of available updates for the blade server, go to http://www.ibm.com/support/fixcentral.

      When you click an update, an information page is displayed, including a list of the problems that the update fixes. Review this list for your specific problem; however, even if your problem is not listed, installing the update might solve the problem.

5. **Check for and correct an incorrect configuration.** If the blade server is incorrectly configured, a system function can fail to work when you enable it; if you make an incorrect change to the blade server configuration, a system function that has been enabled can stop working.

   a. **Make sure that all installed hardware and software are supported.** See http://www.ibm.com/systems/info/x86servers/serverproven/compat/us to verify that the blade server supports the installed operating system, optional devices, and software levels. If any hardware or software component is not supported, uninstall it to determine whether it is causing the problem. You must remove nonsupported hardware before you contact IBM or an approved warranty service provider for support.

   b. **Make sure that the server, operating system, and software are installed and configured correctly.** Many configuration problems are caused by loose power or signal cables or incorrectly seated adapters. You might be able to solve the problem by turning off the blade server, reconnecting cables, reseating adapters, and turning the blade server back on. For information about performing the checkout procedure, see “Checkout procedure” on page 163

page 163. For information about configuring the blade server, see Chapter 3, “Configuring the blade server,” on page 19.

6. **See controller and management software documentation.** If the problem is associated with a specific function (for example, if a RAID hard disk drive is marked offline in the RAID array), see the documentation for the associated controller and management or controlling software to verify that the controller is correctly configured.

   Problem determination information is available for many devices such as RAID and network adapters.

   For problems with operating systems or IBM software or devices, go to http://www.ibm.com/supportportal.

7. **Check for troubleshooting procedures and RETAIN tips.** Troubleshooting procedures and RETAIN tips document known problems and suggested solutions. To search for troubleshooting procedures and RETAIN tips, go to http://www.ibm.com/supportportal.

8. **Use the troubleshooting tables.** See “Troubleshooting tables” on page 164 to find a solution to a problem that has identifiable symptoms.

   A single problem might cause multiple symptoms. Follow the troubleshooting procedure for the most obvious symptom. If that procedure does not diagnose the problem, use the procedure for another symptom, if possible.

   If the problem remains, contact IBM or an approved warranty service provider for assistance with additional problem determination and possible hardware replacement. To open an online service request, go to http://www.ibm.com/support/entry/portal/Open_service_request. Be prepared to provide information about any error codes and collected data.

Undocumented problems

If you have completed the diagnostic procedure and the problem remains, the problem might not have been previously identified by IBM. After you have verified that all code is at the latest level, all hardware and software configurations are valid, and no light path diagnostics LEDs or log entries indicate a hardware component failure, contact IBM or an approved warranty service provider for assistance.

To open an online service request, go to http://www.ibm.com/support/entry/portal/Open_service_request. Be prepared to provide information about any error codes and collected data and the problem determination procedures that you have used.

Chapter 2. Introduction

Use this information to help you solve problems that might occur in your blade server.

This *Problem Determination and Service Guide* contains information to help you solve problems that might occur in your IBM BladeCenter HS22V Type 7871 or 1949 blade server. 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 three types:

- **Consumable parts:** 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 CRU:** 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 Information* document on the IBM *Documentation* CD.

Related documentation

Use this information to identify and locate related blade server documentation.

This *Problem Determination and Service Guide* document is in Portable Document Format (PDF) on the IBM *Documentation* CD. It contains information to help you solve problems yourself, and it contains information for service technicians:

- *Installation and User's Guide*

  The *Installation and User's Guide* contains general information about the blade server, including how to install supported optional devices and how to configure the blade server. The following documentation also comes with the blade 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.
- *Safety Information Labels*

  This document provides the Simplified Chinese, Mongolian, Tibetan, Uygur, and Zhuang translated versions of the product safety labels.
- *Warranty and Support Information*

  This document is in PDF on the IBM *Documentation* CD. It contains information about the terms of the warranty and getting service and assistance.
- *Environmental Notices and User Guide*

  This document is in PDF on the IBM *Documentation* CD. It contains translated environmental notices.
- *Integrated Management Module User's Guide*

  This document is in PDF on the IBM website. This document explains how to use the functions of the IMM installed in an IBM server. The IMM works with IBM System x Server Firmware to provide systems-management capability for System x and BladeCenter servers.
- *Advanced Management Module Messages Guide*

  This document is in PDF on the IBM website at http://www.ibm.com/supportportal/. This document provides a complete list of all non-device specific events and recommended actions, sorted by event ID. Device specific event information is in the documentation for the device.
- *Advanced Management Module User's Guide*

  This document is in PDF on the IBM website at http://www.ibm.com/supportportal/. This document contains information about configuring the advanced management module and managing components that are installed in an IBM BladeCenter unit. Information about configuring management modules other than the advanced management module is in a separate document.

Depending on your BladeCenter product, additional documents might be included on the IBM *Documentation* CD. In addition to the documentation in this library, be sure to review the *Planning and Installation Guide* for your BladeCenter unit for information to help you prepare for system installation and configuration. To check for updated documentation and technical updates, complete the following steps.

Note: Changes are made periodically to the IBM website. 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 **Publications lookup**.
4. From the **Product family** menu, select **BladeCenter HS22V** and click **Continue**.

You can also find documentation related to BladeCenter products at http://publib.boulder.ibm.com/infocenter/bladectr/documentation/index.jsp.

IBM Redbooks publications are developed and published by the IBM International Technical Support Organization (ITSO). The ITSO develops and delivers skills, technical know-how, and materials to IBM technical professionals, Business Partners, clients, and the marketplace in general. For IBM Redbooks publications for your BladeCenter, go to http://www.redbooks.ibm.com/portals/bladecenter.

Notices and statements in this document

Use this information to understand the most common documentation notices and statements and how they are used.

The caution and danger statements 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 possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage might 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

Use this table to view specific information about the blade server, such as blade server hardware features and the dimensions 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 USB media drives and devices. The BladeCenter unit uses USB for internal communications with these devices.

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

Table 1. Features and specifications

Microprocessor: Supports up to two multi-core Intel Xeon microprocessors
Note: Use the Setup utility to determine the type and speed of the microprocessors in the blade server.

Integrated functions:
- Horizontal-compact-form-factor (CFFh) expansion card interface
- Vertical-combination-I/O (CIOv) expansion card interface
- Local service processor: Integrated Management Module (IMM) with Intelligent Platform Management Interface (IPMI) firmware
- Vitesse VSC452 iBMC controller
- Integrated Matrox G200e video adapter
- LSI 1064E SAS controller
- Broadcom BCM5709S dual-port Gigabit Ethernet controller
- Integrated keyboard/video/mouse (cKVM) controller through IMM
- Light path diagnostics
- RS-485 interface for communication with the management module
- Automatic server restart (ASR)
- USB 2.0 for communication with cKVM and removable media drives (an external USB port is not supported)
- Serial over LAN (SOL)
- Redundant buses for communication with keyboard, mouse, and removable media drives

Predictive Failure Analysis (PFA) alerts:
- Microprocessors
- Memory
- Storage drives

Memory:
- 18 dual inline memory module (DIMM) connectors
- Type: Very Low Profile (VLP) double-data rate (DDR3) DRAM. Supports 1 GB, 2 GB, 4 GB, 8 GB, and 16 GB DIMMs with up to 288 GB of total memory on the system board

Electrical input: 12 V dc

Environment:
- Air temperature:
  - Blade server on: 10°C to 35°C (50°F to 95°F). Altitude: 0 m to 914.4 m (0 ft to 3000 ft)
  - Blade server on: 10°C to 32°C (50°F to 89.6°F). Altitude: 914.4 m to 2133.6 m (3000 ft to 7000 ft)
  - Blade server off: 10°C to 43°C (50°F to 109.4°F). Altitude: 914.4 m to 2133.6 m (3000 ft to 7000 ft)
  - Blade server storage: 1°C to 60°C (34 to 140°F)
  - Blade server shipping: -40°C to 60°C (-40°F to 140°F)
- Humidity:
  - Blade server on: 8% to 80%
  - Blade server off: 8% to 80%
  - Blade server storage: 5% to 80%
  - Blade server shipment: 5% to 100%
- Particulate contamination:

  Attention: Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server. For information about the limits for particulates and gases, see "Particulate contamination" on page 231.

Drives: Supports up to two solid state drives (SSD)

Size:
- Height: 24.5 cm (9.7 inches) (6U)
- Depth: 44.6 cm (17.6 inches)
- Width: 2.9 cm (1.14 inches)
- Maximum weight: 4.8 kg (10 lb)

NEBS Environment:
- Air temperature:
  - Blade server on: 5°C to 40°C (41°F to 104°F). Altitude: -60 m to 1800 m (-197 ft to 6000 ft)
  - Blade server on: 5°C to 30°C (41°F to 86°F). Altitude: 1800 m to 4000 m (6000 ft to 13000 ft)
  - Blade server off: -5°C to 55°C (23°F to 131°F). Altitude: -60 m to 1800 m (-197 ft to 6000 ft)
  - Blade server off: -5°C to 45°C (23°F to 113°F). Altitude: 1800 m to 4000 m (6000 ft to 13000 ft)
  - Blade server storage: -40°C to 60°C (-40°F to 140°F)
- Humidity: 8% to 85%
- Particulate contamination:

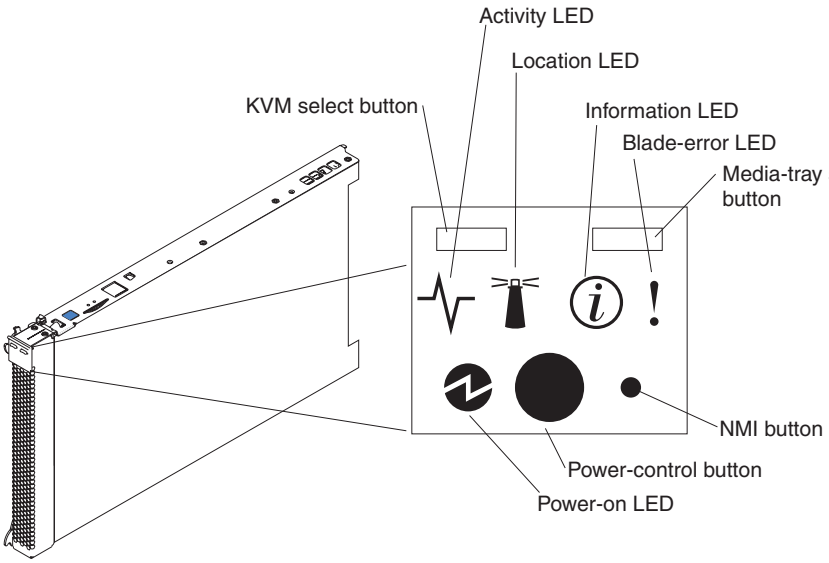
  Attention: Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server. For information about the limits for particulates and gases, see "Particulate contamination" on page 231.

Blade server controls and LEDs

Use this information for details about the controls and LEDs on the blade server.

The following illustration identifies the buttons and information LEDs on the blade-server control panel.

Note: The control panel is covered by a protective access panel. Use your finger and pull down on the access panel to open it.



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 Advanced-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

blade_server_number is the two-digit number of the blade-server bay in which the blade server is installed. A blade server that occupies more than one blade-server 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 Advanced-Management-Module Web interface to determine whether local control has been disabled on the blade server. See http://www.ibm.com/systems/management/ for more information.

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).

Media-tray select button: Press this button to associate the shared BladeCenter unit media tray (removable-media drives) 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 Advanced-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 removable-media drives and front-panel USB ports.
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 external storage device or network.

Location LED: The system administrator can remotely turn on this blue LED to aid in visually locating the blade server. When this LED is lit, the location LED on the BladeCenter unit is also lit. The location LED can be turned off through the Advanced-Management-Module Web interface or through IBM® Director Console. For more information about the Advanced-Management-Module Web interface, see http://www.ibm.com/systems/management/. For more information about IBM® Director, see the documentation on the IBM® Director CD that comes with the server, or visit the IBM® Director Information Center at http://publib.boulder.ibm.com/infocenter/director/v6r1x/index.jsp.

Information LED: When this amber LED is lit, it indicates that information about a system event in the blade server has been placed in the Advanced-Management-Module event log. The information LED can be turned off through the Advanced-Management-Module CLI, SNMP, or Web interface or through IBM® Director Console. For more information about the Advanced-Management-Module Web interface, see http://www.ibm.com/systems/management/. For more information about IBM® Director, see the documentation on the IBM® Director CD that comes with the server, or visit the IBM® Director Information Center at http://publib.boulder.ibm.com/infocenter/director/v6r1x/index.jsp.

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 turns off only after the error is corrected.

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

- Flashing rapidly: The blade server does not have power permissions assigned to it through the Advanced Management Module, the BladeCenter unit does not have enough power to turn on the blade server, or the service processor (IMM) on the blade server is not communicating with the Advanced Management Module.
- Flashing slowly: The blade server has power supplied and is ready to be turned on.
- Lit continuously: The blade server has power and is turned on.

Power-control button: Use your finger to open the access panel on the front of the blade server, then, press the power-control 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 Advanced-Management-Module Web interface.

NMI button (recessed): The nonmaskable interrupt (NMI) dumps the partition. Use this recessed button only as directed by IBM Support.

Note: You can also send an NMI event to the selected blade server remotely using the AMM. For more information, see the *BladeCenter Advanced Management Module User's Guide*.

Turning on the blade server

Use this information to turn 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 (see "Blade server controls and LEDs" on page 10) to start the blade server.

  Notes:

  1. Wait until the power-on LED on the blade server flashes slowly before you press the power-control button. While the service processor in the blade server is initializing and synchronizing with the management module, the power-on LED flashes rapidly, and the power-control button on the blade server does not respond. This process can take approximately two minutes after the blade server has been installed.
  2. While the blade server is starting, the power-on LED on the front of the blade server is lit and does not flash. See "Blade server controls and LEDs" on page 10 for the power-on LED states.
- If a power failure occurs, the BladeCenter unit and the blade server can be configured to start automatically when power is restored through the Advanced Management Module.
- 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 blade server is communicating with the management module, 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

Use this information to turn 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 (see "Blade server controls and LEDs" on page 10). This starts an orderly shutdown of the operating system, if this feature is supported by the operating system.
- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the blade server.
- The management module can turn off the blade server through the Advanced-Management-Module Web interface. For additional information, see the *IBM BladeCenter Advanced Management Module User's Guide* or go to http://www.ibm.com/systems/management/ for more information.

System-board layouts

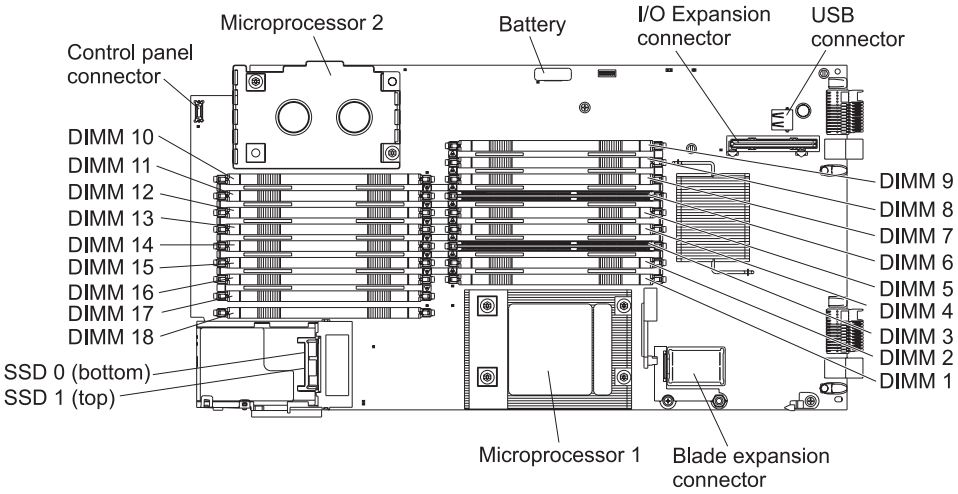
Use this layout to locate connectors, LEDs and switches on the system board of the blade server.

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

Blade server connectors

Use this information to locate blade server system-board components and connectors for optional devices.

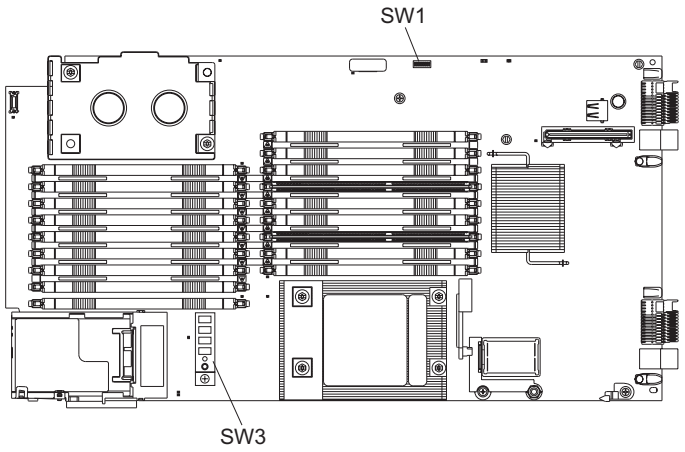
The following illustration shows the system-board components, including connectors for user-installable optional devices, in the blade server.



System-board switches

Use this information to locate and define system-board switches in the blade server.

The following illustration shows the location of the light path diagnostics switch on the system board.



The following table describes the function of each switch in the switch blocks (SW1 and SW3).

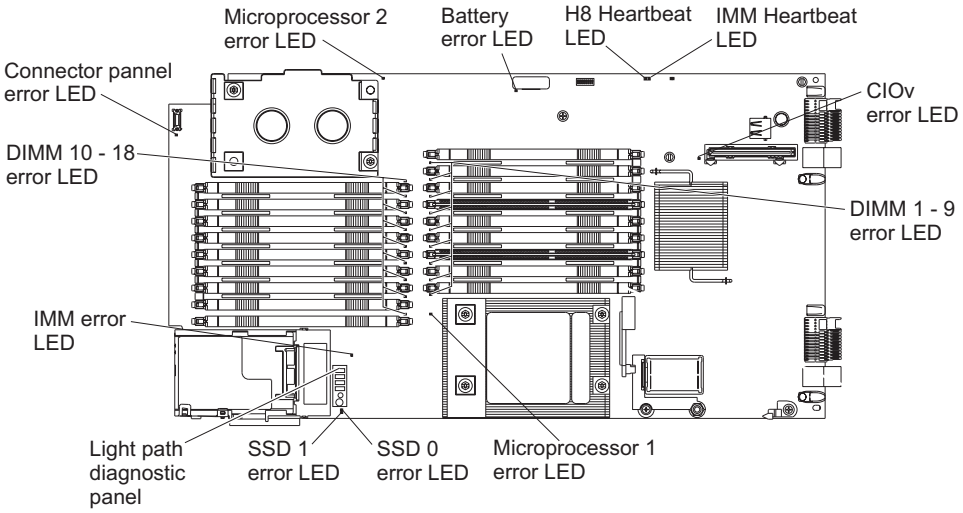
Switch number	Description	Switch setting	Definition
SW1 - 1	Password override switch	Changing position of this switch resets the power on password.	This switch overrides the power on password. The system ships with this switch off, but it can be on or off in a functioning system.
SW1 - 2	Trusted Platform Module (TPM) physical presence	The default position is off.	Turning this switch to the on position indicates a physical presence to the TPM.
SW1 - 3	ICH10 RTC reset	Normally open. Toggle to reset RTC.	Resets the RTC. A momentary toggle is all that is required. To avoid excessive battery drain, do not leave this switch closed.
SW1 - 4	Boot using the backup IMM code.	The default position is off, allowing the blade server to boot from the primary IMM firmware.	When the switch is in the default off position, the blade server will boot using the primary IMM firmware. When the switch is on, the blade server will boot using a backup of the IMM firmware.

Switch number	Description	Switch setting	Definition
SW1 - 5	Boot block recovery	The default position is off, allowing the blade server to boot from the primary UEFI firmware.	When the switch is on it allows the blade server to boot using the backup UEFI.
SW1 - 6	IMM force update	The default position is off.	For trained service technician only.
SW1 - 7	Wake on LAN (WOL) disable	The default position is off.	Turning this switch to the on position disables WOL.
SW1 - 8	Force H8 update	The default position is off.	N/A
SW3	Light path diagnostics switch	The default position is off. Turning this switch on lights the light path diagnostic LEDs.	Push down on the light path diagnostics switch push button to light the diagnostic LEDs.

System-board LEDs

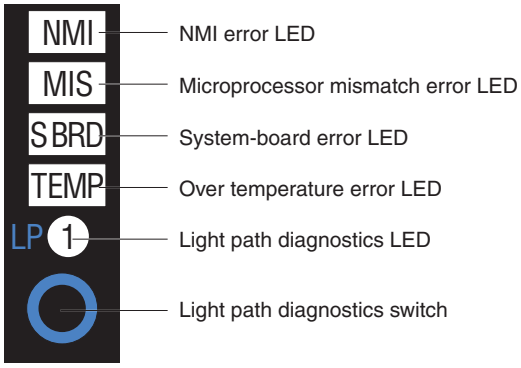
Use this information to locate system-board LEDs in the blade server.

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 (see "System-board switches" on page 15) to light any error LEDs that were turned on during processing. Diagnosing problems using the light path diagnostic LEDs is described in "Light path diagnostics" on page 181.

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



Chapter 3. Configuring the blade server

Use this information for details about the configuration requirements of the blade server.

This chapter describes the configuration requirements of the blade server. Before you continue, make sure that the blade server has the latest version of firmware code. For additional information, see "Firmware updates" on page 33.

The following configuration programs come with the blade server:

- **Setup utility**

  The Setup utility is used to change system settings, such as interrupt requests (IRQ), date and time, and password. See "Using the Setup utility" on page 20 for more information.

- **LSI Logic Configuration Utility program**

  The LSI Logic Configuration Utility program is stored in the blade-server firmware. Use it to set the device scan order and to set the storage drive controller IDs. See "Using the LSI Logic Configuration Utility program" on page 36 for more information.

- **IBM FastSetup**

  IBM FastSetup is a no-cost software tool that helps simplify the maintenance and deployment of selected IBM BladeCenter chassis, servers, and components. The intuitive graphical interface initializes all phases of server setup, including discovery, update, and configuration. Features include templates that enable replication of settings to many servers and automation that reduces hands-on time and user errors. Wizards and other default settings enable customization capabilities. The low-touch, set-once and walk-away feature reduces the hands-on server setup time from days to minutes, particularly for larger deployments. For information about this tool, see http://www.ibm.com/support/entry/portal/docdisplay?lndocid=TOOL-FASTSET .

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

  The ServerGuide program provides software-setup tools and installation tools that are designed for the blade server. Use this CD during the installation of the blade server to configure basic hardware features and to simplify the installation of the operating system. For information about obtaining and using this CD, see "Using the ServerGuide Setup and Installation CD" on page 29.

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

  The PXE boot agent utility program is part of the blade server firmware. Use it to select the boot protocol and other boot options and to select a power-management option. For information about using this utility program, see "Using the PXE boot agent utility program" on page 33.

The IBM Remote Deployment Manager (RDM) Version 4.4 program is available for purchase. You can use RDM to install a UEFI code update onto a blade server. For the latest information about RDM, including which operating systems that RDM supports and how to purchase the software, see http://www.ibm.com/systems/management/.

Using the Setup utility

Use these instructions to start the Setup utility.

To start the Setup utility, complete the following steps:

1. Turn on the blade server (see "Turning on the blade server" on page 13).
2. Immediately give the blade server control of the BladeCenter unit shared keyboard, video, and mouse ports.
   - If you are managing the blade server by using the BladeCenter system console, press the KVM select button on the blade server (see "Blade server controls and LEDs" on page 10 for information).
   - If you are managing the blade server from a remote location, see the *IBM BladeCenter Advanced Management Module User's Guide*, *IBM BladeCenter Advanced Management Module Command-Line Interface Reference Guide*, or *IBM BladeCenter Serial over LAN Setup Guide* for information and instructions.
3. When the prompt `<F1> Setup` is displayed, press F1. If you have set an administrator password, you must type the administrator password to access the full Setup-utility menu. If you do not type the administrator password, a limited Setup-utility menu is available.
4. Follow the instructions on the screen.

Setup utility menu

Use the Setup utility main menu to view and configure blade server configuration data and settings.

The following menu items are on the Setup utility main menu. Depending on the version of the Unified Extensible Firmware Interface (UEFI), some menu items might differ slightly from these descriptions. Use the help within the Setup utility for more information on the available menu items and selections.

- **System Information**

  Select this choice to view information about the server. When you make changes through other choices in the Setup utility, some of those changes are reflected in the system information; you cannot change settings directly in the system information. This choice is on the full Setup utility menu only.

  – **System Summary**

    Select this choice to view configuration information, including the ID, speed, and cache size of the microprocessors, machine type and model of the server, the serial number, the system UUID, and the amount of installed memory. When you make configuration changes through other options in the Setup utility, the changes are reflected in the system summary; you cannot change settings directly in the system summary.

  – **Product Data**

    Select this choice to view the system-board identifier, the revision level or issue date of the firmware, the integrated management module and diagnostics code, and the version and date.

  Note: The following choices are on the full UEFI Setup Utility menu only.

- **System Settings**

  Select this choice to view or change the server component settings.

  – **Processors**

    Select this choice to view or change the processor settings.

– **Memory**

  Select this choice to view or change the memory settings.

– **Devices and I/O Ports**

  Select this choice to view or change assignments for devices and input/output (I/O) ports. You can configure the remote console redirection, enable or disable integrated Ethernet controllers, and the SAS controller. If you disable a device, it cannot be configured, and the operating system will not be able to detect it (this is equivalent to disconnecting the device).

– **Power**

  Select this choice to view or change power capping to control power consumption and processor performance states.

– **Legacy Support**

  Select this choice to view or set legacy support.

  - **Force Legacy Video on Boot**

    Select this choice to force INT video support, if the operating system does not support UEFI video output standards.

  - **Rehook INT**

    Select this choice to enable or disable devices from taking control of the boot process. The default is **Disable**.

  - **Legacy Thunk Support**

    Select this choice to enable or disable UEFI to interact with PCI mass storage devices that are non-UEFI compliant.

– **Integrated Management Module**

  Select this choice to view or change the settings for the integrated management module.

  - **POST Watchdog Timer**

    Select this choice to view or enable the POST watchdog timer.

  - **POST Watchdog Timer Value**

    Select this choice to view or set the POST loader watchdog timer value.

  - **Reboot System on NMI**

    Enable or disable restarting the system whenever a nonmaskable interrupt (NMI) occurs. **Disabled** is the default.

  - **Network Configuration**

    Select this choice to view the system management network interface port, the IMM MAC address, the current IMM IP address, and host name; define the static IMM IP address, subnet mask, and gateway address, specify whether to use the static IP address or have DHCP assign the IMM IP address, save the network changes, and reset the IMM.

  - **Reset IMM to Defaults**

    Select this choice to view or reset IMM to the default settings.

– **System Security**

  Select this choice to view or configure security options.

– **Adapters and UEFI Drivers**

  Select this choice to view information about the adapters and UEFI drivers installed in the server.

– **Network**

  Select this choice to view or configure the network device options, such as iSCSI, PXE, and Broadcom.

  - **Trusted Platform Module (TPM)**

    Select this choice to view and configure TPM settings.

- **Date and Time**

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

  This choice is on the full UEFI Setup Utility menu only.

- **Start Options**

  Select this choice to view or change the start options, including the startup sequence, keyboard NumLock state, PXE boot option, and PCI device boot priority. Changes in the startup options take effect when you start the server.

  The startup sequence specifies the order in which the server checks devices to find a boot record. The server starts from the first boot record that it finds. If the server has Wake on LAN hardware and software and the operating system supports Wake on LAN functions, you can specify a startup sequence for the Wake on LAN functions. For example, you can define a startup sequence that checks for a disc in the CD-RW/DVD drive, then checks the hard disk drive, and then checks a network adapter.

  This choice is on the full UEFI Setup Utility menu only.

- **Boot Manager**

  Select this choice to view, add, delete, or change the device boot priority, boot from a file, select a one-time boot, or reset the boot order to the default setting.

- **System Event Logs**

  Select this choice to enter the System Event Manager, where you can view the error messages in the system event logs. You can use the arrow keys to move between pages in the error log.

  The system event logs contain all event and error messages that have been generated during POST, by the systems-management interface handler, and by the system service processor. Run the diagnostic programs to get more information about error codes that occur. See Chapter 6, “Diagnostics,” on page 97 for instructions on running the diagnostic programs.

  Important: If the system-error LED on the front of the server is lit but there are no other error indications, clear the IMM system-event log. Also, after you complete a repair or correct an error, clear the IMM system-event log to turn off the system-error LED on the front of the server.

  - **POST Event Viewer**

    Select this choice to enter the POST event viewer to view the POST error messages.

  - **IMM System Event Log**

    Select this choice to view the IMM system event log.

  - **Clear IMM System Event Log**

    Select this choice to clear the IMM system event log.

- **User Security**

  Select this choice to set, change, or clear passwords. See “Using passwords” on page 23 for more information.

- **Save Settings**

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

- **Restore Settings**

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

- **Load Default Settings**

  Select this choice to cancel the changes that you have made in the settings and restore the factory settings.
- **Exit Setup**

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

Using passwords

Use this information to set, change, or delete a power-on password.

You can set, change, and delete a power-on password in the Setup/Configuration utility by selecting **System Settings** then **System Security**.

If you set a power-on password, you must type the power-on password to complete the system startup and to have access to the Setup utility.

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

If you forget the power-on password, you can regain access to the blade server either by removing the blade server battery and then reinstalling it or by using the power-on password override switch (see “Removing the battery” on page 71 and “Installing the battery” on page 72).

Using the Boot Menu program

Use the Boot Menu program to temporarily redefine the first startup device without changing settings in the Setup utility.

The Boot Menu program is a built-in, menu-driven configuration utility program that you can use to temporarily redefine the first startup device without changing settings in the Setup utility.

To use the Boot Menu program, complete the following steps:

1. Turn off the server.
2. Restart the server.
3. When the prompt `<F12> Select Boot Device` is displayed, press F12 . If a bootable USB mass storage device is installed, a submenu item (**USB Key/Disk**) is displayed.
4. Use the Up arrow and Down arrow keys to select an item from the **Boot Selection Menu** and press Enter.

The next time the server starts, it returns to the startup sequence that is set in the Setup utility.

Updating the Universal Unique Identifier (UUID)

The Universal Unique Identifier (UUID) must be updated when the system board is replaced.

The Universal Unique Identifier (UUID) must be updated when the system board is replaced. Use the Advanced Settings Utility (ASU) to update the UUID in the UEFI-based server. The ASU is an online tool that supports several operating

systems. Make sure that you download the version for your operating system. You can download the ASU from the IBM Web site. To download the ASU and update the UUID, 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. Download the Advanced Settings Utility (ASU):
   a. Go to http://www.ibm.com/systems/support/.
   b. Under Product support, select **BladeCenter**.
   c. Under Popular links, select **Tools and utilities**.
   d. Scroll down to Configuration; then, select **Advanced Settings Utility (ASU)**.
   e. In the next window under Download, click the **Advanced Settings Utility** link and download the ASU version for your blade server.

      Note: To view more information about using the Advanced Settings Utility, scroll down to Online Help; then, click **User's Guide for the IBM Advanced Settings Utility**.
   f. In the next window under File link, click the Advanced Settings Utility link for your operating system to begin downloading the utility.
2. ASU sets the UUID in the Integrated Management Module (IMM). Select one of the following methods to access the Integrated Management Module (IMM) to set the UUID:
   - Online from the target system (LAN or keyboard console style (KCS) access)
   - Remote access to the target system (LAN based)
   - Bootable media containing ASU (LAN or KCS, depending upon the bootable media)

     Note: IBM provides a method for building a bootable media. You can create a bootable media using the Bootable Media Creator (BoMC) application from the Tools Center Web site. In addition, the Windows and Linux based tool kits are also available to build a bootable media. These tool kits provide an alternate method to creating a Windows Professional Edition or Master Control Program (MCP) based bootable media, which will include the ASU application.
3. Copy and unpack the ASU package, which also includes other required files, to the server. Make sure that you unpack the ASU and the required files to the same directory. In addition to the application executable (asu or asu64), the following files are required:
   - For Windows based operating systems:
     – ibm_rndis_server_os.inf
     – device.cat
   - For Linux based operating systems:
     – cdc_interface.sh
4. After you install ASU, use the following command syntax to set the UUID:

   ```
   asu set SYSTEM_PROD_DATA.SysInfoUUID <uuid_value> [access_method]
   ```

   Where:

   <uuid_value>
   Up to 16-byte hexadecimal value assigned by you.

[access_method]
The access method that you selected to use from the following methods:

- Online authenticated LAN access, type the command:

  `[host <imm_internal_ip>] [user <imm_user_id>][password <imm_password>]`

  Where:

  imm_internal_ip
  The IMM internal LAN/USB IP address. The default value is 169.254.95.118.

  imm_user_id
  The IMM `account` (1 of 12 accounts). The default value is USERID.

  imm_password
  The IMM account password (1 of 12 accounts). The default value is PASSW0RD (with a zero 0 not an O).

  Note: If you do not specify any of these parameters, ASU will use the default values. When the default values are used and ASU is unable to access the IMM using the online authenticated LAN access method, ASU will automatically use the unauthenticated KCS access method.

  The following commands are examples of using the userid and password default values and not using the default values:

  Example that does not use the userid and password default values:
  `asu set SYSTEM_PROD_DATA.SYsInfoUUID <uuid_value> user <user_id> password <password>`

  Example that does use the userid and password default values:
  `asu set SYSTEM_PROD_DATA.SysInfoUUID <uuid_value>`

- Online KCS access (unauthenticated and user restricted):

  You do not need to specify a value for *access_method* when you use this access method.

  Example:
  `asu set SYSTEM_PROD_DATA.SysInfoUUID <uuid_value>`

  The KCS access method uses the IPMI/KCS interface. This method requires that the IPMI driver be installed. Some operating systems have the IPMI driver installed by default. ASU provides the corresponding mapping layer. See the *Advanced Settings Utility Users Guide* for more details. You can access the ASU Users Guide from the IBM Web site.

- Remote LAN access, type the command:

  Note: When using the remote LAN access method to access IMM using the LAN from a client, the *host* and the *imm_external_ip* address are required parameters.

  `host <imm_external_ip> [user <imm_user_id>[[password <imm_password>]`

  Where:

  imm_external_ip
  The external IMM LAN IP address. There is no default value. This parameter is required.

  imm_user_id
  The IMM `account` (1 of 12 accounts). The default value is USERID.

imm_password
The IMM account password (1 of 12 accounts). The default value is PASSW0RD (with a zero 0 not an O).

The following commands are examples of using the userid and password default values and not using the default values:

Example that does not use the userid and password default values:
```
asu set SYSTEM_PROD_DATA.SYsInfoUUID <uuid_value> host <imm_ip>
user <user_id> password <password>
```

Example that does use the userid and password default values:
```
asu set SYSTEM_PROD_DATA.SysInfoUUID <uuid_value> host <imm_ip>
```

- Bootable media:

  You can also build a bootable media using the applications available through the Tools Center Web site at http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp. From the left pane, click **IBM System x and BladeCenter Tools Center**, then click **Tool reference** for the available tools.

5. Restart the server.

Updating the DMI/SMBIOS data

The Desktop Management Interface (DMI) must be updated when the system board is replaced.

The Desktop Management Interface (DMI) must be updated when the system board is replaced. Use the Advanced Settings Utility (ASU) to update the DMI in the UEFI-based server. The ASU is an online tool that supports several operating systems. Make sure that you download the version for your operating system. You can download the ASU from the IBM Web site. To download the ASU and update the DMI, 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. Download the Advanced Settings Utility (ASU):
   a. Go to http://www.ibm.com/systems/support/.
   b. Under Product support, select **BladeCenter**.
   c. Under Popular links, select **Tools and utilities**.
   d. Scroll down to Configuration; then, select **Advanced Settings Utility (ASU)**.
   e. In the next window under Download, click the **Advanced Settings Utility** link and download the ASU version for your blade server.

      Note: To view more information about using the Advanced Settings Utility, scroll down to Online Help; then, click **User's Guide for the IBM Advanced Settings Utility**.

   f. In the next window under File link, click the Advanced Settings Utility link for your operating system to begin downloading the utility.
2. ASU sets the DMI in the Integrated Management Module (IMM). Select one of the following methods to access the Integrated Management Module (IMM) to set the DMI:
   - Online from the target system (LAN or keyboard console style (KCS) access)
   - Remote access to the target system (LAN based)
   - Bootable media containing ASU (LAN or KCS, depending upon the bootable media)

Note: IBM provides a method for building a bootable media. You can create a bootable media using the Bootable Media Creator (BoMC) application from the Tools Center Web site. In addition, the Windows and Linux based tool kits are also available to build a bootable media. These tool kits provide an alternate method to creating a Windows Professional Edition or Master Control Program (MCP) based bootable media, which will include the ASU application.

3. Copy and unpack the ASU package, which also includes other required files, to the server. Make sure that you unpack the ASU and the required files to the same directory. In addition to the application executable (asu or asu64), the following files are required:
   - For Windows based operating systems:
     - ibm_rndis_server_os.inf
     - device.cat
   - For Linux based operating systems:
     - cdc_interface.sh
4. After you install ASU, Type the following commands to set the DMI:

   ```
   asu set SYSTEM_PROD_DATA.SysInfoProdName &ltm/t_model> [access_method]
   asu set SYSTEM_PROD_DATA.SysInfoSerialNum &lts/n> [access_method]
   asu set SYSTEM_PROD_DATA.SysEncloseAssetTag &ltasset_tag>
   [access_method]
   ```

   Where:

   <m/t_model>
   The server machine type and model number. Type `mtm xxxxyyy`, where *xxxx* is the machine type and *yyy* is the server model number.

   <s/n> The serial number on the server. Type `sn zzzzzzz`, where *zzzzzzz* is the serial number.

   <asset_method>
   The server asset tag number. Type `asset aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa`, where *aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa* is the asset tag number.

   [access_method]
   The access method that you select to use from the following methods:

   - Online authenticated LAN access, type the command:

     ```
     [host &ltimm_internal_ip>] [user &ltimm_user_id>][password
     <imm_password>]
     ```

     Where:

     imm_internal_ip
     The IMM internal LAN/USB IP address. The default value is 169.254.95.118.

     imm_user_id
     The IMM account (1 of 12 accounts). The default value is USERID.

     imm_password
     The IMM account password (1 of 12 accounts). The default value is PASSW0RD (with a zero 0 not an O).

     Note: If you do not specify any of these parameters, ASU will use the default values. When the default values are used and ASU is unable to access

the IMM using the online authenticated LAN access method, ASU will automatically use the following unauthenticated KCS access method.

The following commands are examples of using the userid and password default values and not using the default values:

Examples that do not use the userid and password default values:

```
asu set SYSTEM_PROD_DATA.SYsInfoProdName <m/t_model> --user
<imm_user_id> --password <imm_password>
```

```
asu set SYSTEM_PROD_DATA.SYsInfoSerialNum <s/n> --user <imm_user_id>
--password <imm_password>
```

```
asu set SYSTEM_PROD_DATA.SYsEncloseAssetTag <asset_tag> --user
<imm_user_id> --password <imm_password>
```

Examples that do use the userid and password default values:`asu set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model> asu set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n> asu set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag>`

- Online KCS access (unauthenticated and user restricted):

  You do not need to specify a value for *access_method* when you use this access method.

  The KCS access method uses the IPMI/KCS interface. This method requires that the IPMI driver be installed. Some operating systems have the IPMI driver installed by default. ASU provides the corresponding mapping layer. See the *Advanced Settings Utility Users Guide* at http://www-947.ibm.com/systems/support/supportsite.wss/docdisplay?brandind=5000008&lndocid=MIGR-55021 for more details.

  The following commands are examples of using the userid and password default values and not using the default values:

  Examples that do not use the userid and password default values:

  ```
  asu set SYSTEM_PROD_DATA.SYsInfoProdName &ltm/t_model>
  ```

  ```
  asu set SYSTEM_PROD_DATA.SYsInfoSerialNum &lt;s/n>
  ```

  ```
  asu set SYSTEM_PROD_DATA.SYsEncloseAssetTag &ltasset_tag>
  ```

- Remote LAN access, type the command:

  Note: When using the remote LAN access method to access IMM using the LAN from a client, the *host* and the *imm_external_ip* address are required parameters.

  ```
  host <imm_external_ip> [user <imm_user_id>][password <imm_password>]
  ```

  Where:

  imm_external_ip
  : The external IMM LAN IP address. There is no default value. This parameter is required.

  imm_user_id
  : The IMM account (1 of 12 accounts). The default value is USERID.

  imm_password
  : The IMM account password (1 of 12 accounts). The default value is PASSW0RD (with a zero 0 not an O).

  The following commands are examples of using the userid and password default values and not using the default values:

  Examples that do not use the userid and password default values:

```
asu set SYSTEM_PROD_DATA.SYsInfoProdName <m/t_model> --host <imm_ip>
--user <imm_user_id> --password <imm_password>
asu set SYSTEM_PROD_DATA.SYsInfoSerialNum <s/n> --host <imm_ip> --user
<imm_user_id> --password <imm_password>
asu set SYSTEM_PROD_DATA.SYsEncloseAssetTag <asset_tag> --host
<imm_ip> --user <imm_user_id> --password <imm_password>
```

Examples that do use the userid and password default values:

```
asu set SYSTEM_PROD_DATA.SysInfoProdName <m/t_model> --host <imm_ip>
asu set SYSTEM_PROD_DATA.SysInfoSerialNum <s/n> --host <imm_ip>
asu set SYSTEM_PROD_DATA.SysEncloseAssetTag <asset_tag> --host
<imm_ip>
```

- Bootable media:

  You can also build a bootable media using the applications available through the Tools Center Web site at http://publib.boulder.ibm.com/infocenter/toolsctr/v1r0/index.jsp. From Deployment Tools, click **Bootable Media Creator**.

5. Restart the server.

Using the ServerGuide Setup and Installation CD

Use this information as an overview for using the ServerGuide Setup and Installation CD.

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

You can download a free image of the *ServerGuide Setup and Installation* CD or purchase the CD from the ServerGuide fulfillment Web site at http://www.ibm.com/systems/management/serverguide/sub.html. To download the free image, click **IBM Service and Support Site**.

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

The ServerGuide program performs the following tasks:

- An easy-to-use interface
- Diskette-free setup and configuration programs that are based on detected hardware
- Device drivers that are provided for the blade server model and detected hardware
- Operating-system partition size and file-system type that are selectable during setup

ServerGuide features

Use this information to determine the ServerGuide features.

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

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

The ServerGuide program has the following features:

- Sets system date and time
- Detects installed optional hardware devices and provides updated device drivers for most adapters and devices
- Provides diskette-free installation for supported Windows operating systems
- Includes an online readme file with links to tips for the hardware and operating-system installation

Setup and configuration overview

Use this information to setup and configure the blade server.

When you use the *ServerGuide Setup and Installation* CD, you do not need setup diskettes. You can use the CD to configure any supported IBM blade server model. The setup program provides a list of tasks that are required to set up the blade server.

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

When you start the *ServerGuide Setup and Installation* CD, the program prompts you to complete the following tasks:

- Select your language.
- Select your keyboard layout and country.
- View the overview to learn about ServerGuide features.
- View the readme file to review installation tips for your operating system and adapter.
- Start the operating-system installation. You will need your operating-system CD.

Installing the operating system

Use these instructions to install the operating system on the blade server.

To install the operating system on a blade server, you can use any of the following methods:

- Use the *ServerGuide Setup and Installation* CD to install a supported Microsoft Windows operating system.
- Use Remote Deployment Manager (RDM) Version 4.20 (or later) to install a supported operating system. To determine whether RDM supports an operating system, see http://www.ibm.com/systems/management/.
- Download the latest operating-system installation instructions and install the operating system.

Important: The operating system in the blade server must provide USB support for the blade server to recognize and use the keyboard, mouse, and removable-media drives. The BladeCenter unit uses USB for internal communication with these devices.

Typical operating-system installation

Use this information for a typical ServerGuide operating-system installation.

The ServerGuide program can reduce the time it takes to install an operating system. It provides the device drivers that are required for the hardware and for the operating system that you are installing. This section describes a typical ServerGuide operating-system installation.

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

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

Installing the operating system without using ServerGuide

Use these instructions to install the operating system on the blade server without using a ServerGuide.

If you have already configured the blade server hardware and you are not using the ServerGuide program to install the operating system, complete the following steps to download the latest operating-system installation instructions from the IBM Web site.

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/support/.
2. Under **Support type**, select **BladeCenter**.
3. Under **Popular links**, select **Operating system installation**.
4. Under **Choose the system you want instructions for**, click **BladeCenter HS22V**.
5. From the **Installation** list, select your operating system to display the available installation documents.

Using the PXE boot agent utility program

Use these instruction to start the PXE boot agent utility program.

Use the Preboot Execution Environment (PXE) boot agent utility program to select the boot protocol and other boot options and to select a power-management option.

Notes:

1. The blade server does not support Remote Program Load (RPL) selection for the boot protocol option.
2. Enabling PXE might reduce the number of optional expansion modules that your blade server can manage.

To start the PXE boot agent utility program, complete the following steps:

1. Turn on the server (see "Turning on the blade server" on page 13).
2. When the `Broadcom NetXtreme Boot Agent vX.X.X` prompt is displayed, press Ctrl + S. You have 2 seconds (by default) to press Ctrl + S after the prompt is displayed.
3. Follow the instructions on the screen to change the settings of the selected items.

Firmware updates

Use this information to update the blade server to the latest levels of UEFI code and firmware updates.

IBM periodically makes UEFI code, service processor firmware, and diagnostic firmware updates available for the blade server and the BladeCenter unit. Before you install the blade server in a BladeCenter unit, go to http://www.ibm.com/systems/support/ to download the latest firmware for the BladeCenter unit and the blade server. Install the updates, using the instructions that are included with the downloaded files.

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

Configuring UEFI compatible devices

Use this information to configure UEFI compatible devices.

Your IBM BladeCenter HS22V Type 7871 and 1949 blade server is UEFI compatible. UEFI compatible expansion cards can be configured through the Setup utility. To configure a UEFI compatible expansion card, complete the following steps:

Note: Before configuring a UEFI compatible device, it is recommended to update the firmware for your blade server. See "Firmware updates" on page 33 for information on how to update the firmware for your blade server.

1. Run the Setup utility (see "Using the Setup utility" on page 20).
2. Select **System Settings** → **Adapters and UEFI drivers**.
3. Select **Please refresh this page first** and press Enter.
4. Select the device driver that you want to configure and press Enter.
5. When you have finished changing settings, press Esc to exit from the program; select **Save** to save the settings that you have changed.

Configuring the Gigabit Ethernet controller

Use this information to locate the device drivers for the Gigabit Ethernet controller.

One dual-port Gigabit Ethernet controller is integrated on the blade server system board. The controller provides a 1000 Mbps full-duplex interface for connecting to one of the Ethernet-compatible I/O modules in I/O-module bays 1 and 2, which enables simultaneous transmission and reception of data on the Ethernet local area network (LAN). The Ethernet controller on the system board is routed to I/O-module bay 1 or bay 2. The logical link of each Ethernet port to an I/O-module bay is assigned by the operating system.

You do not have to set any jumpers or configure the controller for the blade server operating system. However, you must install a device driver to enable the blade server operating system to address the Ethernet controller. For device drivers and information about configuring the Ethernet controller, 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/support/.
2. Under **Select product or service type for support**, select **BladeCenter**.
3. Under **Popular links**, click **Software and device drivers**.
4. From the **IBM BladeCenter** menu, select **BladeCenter HS22V**.
5. From the download categories, click the **Networking** category.
6. Find the device driver for your operating system; then, click on the version number to go to the download page for the device driver.

Configuring a RAID array

Use this information to configure a RAID array.

Configuring a RAID array applies only to a blade server in which two or more storage drives are installed.

Note: The SSD storage drives in your blade server can not be configured into a RAID configuration which spans multiple blade servers, expansion units, or expansion modules.

You can use two storage drives in the blade server to implement and manage RAID level-0 (striping) or RAID level-1 (mirror) arrays in operating systems that are listed on the ServerProven list at http://www.ibm.com/servers/eserver/serverproven/compat/us/. For the blade server, you must configure the RAID by using the LSI Configuration Utility program.

If an optional RAID expansion card is installed, you can use it to control all of the storage drives that are installed in the blade server. See the documentation that comes with the expansion card for information on how to configure the RAID array.

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 storage drives and the SAS controller. To start the LSI Logic Configuration Utility, see "Using the LSI Logic Configuration Utility program" on page 36.

Using the LSI Logic Configuration Utility program

Use these instructions to start the LSI Logic Configuration Utility program.

You can use the LSI Logic Configuration Utility program to perform the following tasks:

- Set the SSD scan order
- Set the ID for the SSD controller
- Manage the RAID configuration

To start the LSI Logic Configuration Utility program, complete the following steps:

Note: The LSI controller on your blade server is a UEFI compatible device and can also be configured through the Setup utility for your blade server (see "Configuring UEFI compatible devices" on page 34).

1. Turn on the blade server, and make sure that the blade server is the owner of the keyboard, video, and mouse.
2. When the `<<<Press Ctrl-C to start LSI Logic Configuration Utility>>>` prompt is displayed, press Ctrl+C.
3. Use the arrow keys to select the controller from the list of adapters; then, press Enter.
4. Follow the instructions on the screen to change the settings of the selected items; then, press Enter. If you select **SAS Topology** or **Advanced Adapter Properties**, additional screens are displayed.

Using LAN over USB to interface the IMM

The IMM does not require IPMI device drivers or USB daemons for in-band IMM communication. Instead, a LAN over USB interface enables in-band communications to the IMM; the IMM hardware on the system board presents an internal Ethernet NIC from the IMM to the operating system. LAN over USB is also called the "USB in-band interface" in the IMM Web interface.

Typically, the IMM IP address for the LAN over USB interface is set to a static address of 169.254.95.118 with a subnet mask of 255.255.0.0. In the event of an IP address collision on the network, the IMM might obtain a different IP address in the 169.254.*xxx.xxx* range.

Because the IMM might obtain a random IP address for the LAN over USB interface, the IBM Advanced Settings Utility (ASU) and firmware flash utilities, DSA, and the IBM Director Agent use the Service Location Protocol (SLP) to discover the IMM IP address. These tools perform an SLP multicast discovery on the LAN over USB interface. When they receive a response from the IMM, they obtain the attributes that contain the IP address the IMM is using for the LAN over USB interface.

Potential conflicts with the LAN over USB interface

In some situations, the IMM LAN over USB interface can conflict with certain network configurations, applications, or both.

For example, Open MPI attempts to use all of the available network interfaces on a server. Open MPI detects the IMM LAN over USB interface and attempts to use it to communicate with other systems in a clustered environment. The LAN over

USB interface is an internal interface, so this interface does not work for external communications with other systems in the cluster.

Resolving conflicts with the IMM LAN over USB interface

Use this information to resolve LAN over USB conflicts with network configurations and applications.

There are several actions that resolve LAN over USB conflicts with network configurations and applications:

1. For conflicts with Open MPI, configure the application so it does not attempt to use this interface.
2. Take the interface down (run `ifdown` under Linux).
3. Remove the driver (run `rmmod` under Linux).
4. Disable the USB in-band interface on the IMM through either the IMM Web interface or the AMM Web interface.

   Important: If you disable the USB in-band interface, you cannot perform an in-band update of the IMM firmware using the Linux or Windows flash utilities. If the USB in-band interface is disabled, use the Firmware Update option on the IMM Web interface to update the firmware.

   If you disable the USB in-band interface, also disable the watchdog timeouts to prevent the server from restarting unexpectedly.

   - Use the following steps to disable the LAN over USB interface from the IMM Web interface.
     a. Log in to the IMM on which you want to disable the USB device driver interface.
     b. In the navigation pane, click **System Settings** and scroll down to the **Miscellaneous** area.
     c. Select the **Do not allow commands on USB interface** check box to disable the USB in-band interface. Selecting this option does not affect the USB remote presence functions (for example, keyboard, mouse, and mass storage). When you disable the USB in-band interface, the in-band systems-management applications such as the Advanced Settings Utility (ASU) and firmware update package utilities might not work.

        Note: The ASU works with a disabled USB in-band interface if an IPMI device driver is installed.

        If you try to use systems-management applications while the in-band interface is disabled, they might not work.
     d. Click **Save**.
   - Use the following steps to disable the LAN over USB interface from the Advanced Management Module (AMM) Web interface:
     a. Log in to the AMM Web interface.
     b. In the navigation pane, click **Blade Configuration** under the **Blade Tasks** heading.
     c. Scroll down to the Service Processor LAN over USB interface are on the Blade Configuration web page. The section lists all blades in the chassis which are capable of enabling and disabling the LAN over USB interface.
     d. Select the check boxes next to the blade or blades that you want to enable or disable.

e. Click the **Disable** button to disable the LAN over USB interface on the selected blades.

Configuring the LAN over USB interface manually

Use this information to configure a LAN over USB interface.

The IMM using the LAN over USB interface requires operating-system drivers and other configuration. The firmware update package or Advanced Settings Utility attempt to perform the setup automatically, if needed. If the automatic setup fails or if you prefer to set up the LAN over USB manually, use one of the following processes. For more information about LAN over USB configuration on different operating systems, see the IBM white paper *Transitioning to UEFI and IMM* on the IBM web site (see "Related documentation" on page 6 for information on how to find publications for your blade server).

Windows IPMI device driver

Use this information to install the Microsoft IPMI device driver.

The Microsoft IPMI device driver is not installed by default on Microsoft Windows Server 2003 R2 operating systems. To install the Microsoft IPMI device driver, complete the following steps:

1. From the Windows desktop, click **Start** → **Control Panel**→ **Add or Remove Programs**.
2. Click **Add/Remove Windows Components**.
3. From the component list, select **Management and Monitoring Tools**, and then click **Details**.
4. Select **Hardware Management**.
5. Click **Next**. The installation wizard opens and guides you through the installation.

   Note: The Windows installation disk might be required.

LAN over USB Windows Driver Installation

Use this information to install the LAN over USB driver for Windows.

When you install Windows, there will be an unknown RNDIS device in the device manager. IBM provides a Windows INF file that identifies this device. The signed version of the INF is included in all of the Windows versions of the IMM, UEFI, and DSA update packages. Perform the following steps to install `ibm_rndis_server_os.inf`.

Note: These steps only need to be performed if the server is running a Windows operating system and the `ibm_rndis_server_os.inf` file has not been previously installed. The file needs to be installed only once. It is required by Windows operating systems to detect and use the LAN over USB functionality.

1. Obtain a Windows version of the IMM, server firmware, and DSA update package (see "Firmware updates" on page 33 for more information).
2. Extract the `ibm_rndis_server_os.inf` and `device.cat` files from the firmware update package and copy them to the `\WINDOWS\inf` subdirectory.
3. For Windows 2003: Install the `ibm_rndis_server_os.inf` file by right-clicking on the file and selecting **Install**. This generates a PNF file of the same name in `\WINDOWS\inf`.

For Windows 2008: Go to **Computer Management**, then **Device Manager** and find the RNDIS Device. Select **Properties > Driver > Reinstall driver**. Point the server to the `\Windows\inf` directory where it can find the `ibm_rndis_server_os.inf` file and install the device.

4. Go to **Computer Management** then **Device Manager** and right-click on **Network adapters** and select **Scan for hardware changes**. A small pop-up confirms that the Ethernet device is found and installed. The New Hardware Wizard starts automatically.
5. When you are prompted with the question, “Can Windows connect to Windows Update to search for software?", select **No, not this time**. Click **Next** to continue.
6. When you are prompted with the question, "What do you want the wizard to do?", select **Install from a list or specific location (Advanced)**. Click **Next** to continue.
7. When you are prompted with the statement, "Please choose your search and installation options", select **Don't search. I will choose the driver to install**. Click **Next** to continue.
8. When you are prompted with the statement, "Select a hardware type, and then click Next", select **Network adapters**. Click **Next** to continue.
9. You are prompted with the statement, "Completing the Found New Hardware Wizard". Click **Finish**.

   Note: A new local area connection appears and might state, "This connection has limited or no connectivity". Ignore this message.
10. Go back to the Device Manager. **IBM USB Remote NDIS Network Device** appears under **Network Adapters**.
11. Open a command prompt, type `ipconfig`, and press Enter. The local area connection for the IBM USB RNDIS appears with an IP address in the range of 169.254.*xxx.xxx* with a subnet mask set to 255.255.0.0.

LAN over USB Linux Driver Installation

Use this information to install the LAN over USB driver for Linux.

Current versions of Linux, such as RHEL5 Update 2 and SLES10 Service Pack 2, support the LAN over USB interface by default. This interface is detected and displayed during the installation of these operating systems. When you configure the device, use a static IP address of 169.254.95.130 with a subnet mask of 255.255.0.0.

Note: Older Linux distributions might not detect the LAN over USB interface, and might require manual configuration. For information about configuring LAN over USB on specific Linux distributions, see the IBM white paper *Transitioning to UEFI and IMM* on the IBM web site (see “Related documentation” on page 6 for information on how to find publications for your blade server).

The IMM LAN over USB interface requires that the `usbnet` and `cdc_ether` drivers be loaded. If the drivers have not been installed, use `modprobe` to install them. When these drivers are loaded, the IMM USB network interface shows up as a network device in the operating system. To discover the name that the operating system has assigned to the IMM USB network interface, type:

```
dmesg | grep -i cdc ether
```

The interface is configured with `ifconfig` to have an IP address in the range 169.254.*xxx.xxx*. For example:

```
ifconfig IMM_device_name 169.254.1.102 netmask 255.255.0.0
```

This interface is configured to come up with an IP address in the 169.254.*xxx.xxx* range each time that the operating system is booted.

Chapter 4. Parts listing, Types 7871 and 1949

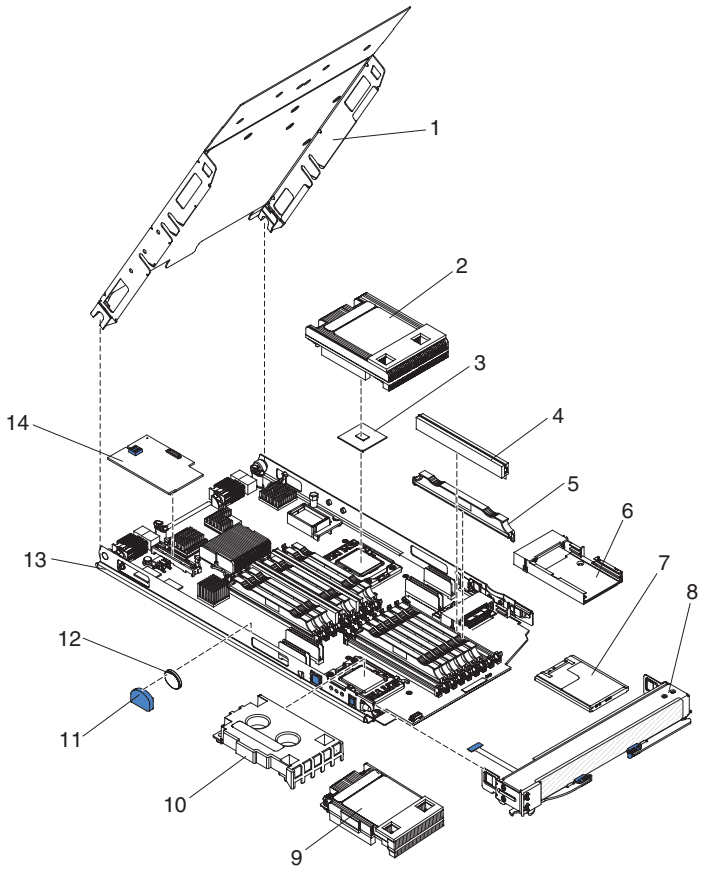
Use this information to remove and replace blade server components.

The following replaceable components are available for the IBM BladeCenter HS22V Types 7871 and 1949 blade server. For an updated parts listing on the Web, 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 HS22V** to display the matrix of downloadable files for the blade server.

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



Replaceable components are of the following types:

- **Consumable parts:** 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 Information* document.

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
1	Cover (all models)	46C7341		
2	Heat sink, microprocessor (Microprocessor 1)			46C7387
3	Microprocessor, Intel Xeon E5603 1.60 GHz/1066MHz-4MB 80W (quad core) (model A5x)			81Y5952
3	Microprocessor, Intel Xeon L5609 1.86 GHz/1066MHz QPI-12MB 40W (quad core)			69Y0783
3	Microprocessor, Intel Xeon L5618 1.87 GHz/1066MHz QPI-12MB 40W (quad core)			69Y4713
3	Microprocessor, Intel Xeon E5503 2.0 GHz/4.8GTps QPI/800MHz-4MB 80W (dual core) (model D3x)			69Y0781
3	Microprocessor, Intel Xeon L5638 2.0 GHz/1333MHz QPI-12MB 60W (six core)			69Y4715
3	Microprocessor, Intel Xeon E5506 2.13 GHz/800MHz-4MB 80W (quad core)			46D1270
3	Microprocessor, Intel Xeon E5606 2.13 GHz/1066MHz-8MB 80W (quad core)			81Y5953
3	Microprocessor, Intel Xeon L5630 2.13 GHz/5.86GTps QPI/1066MHz-12MB 40W (quad core)			59Y3691
3	Microprocessor, Intel Xeon E5607 2.26 GHz/1066MHz-8MB 80W (quad core) (model A7x)			81Y5954
3	Microprocessor, Intel Xeon L5640 2.26 GHz/5.86GTps QPI/1333MHz-12MB 60W (six core) (model N2x)			49Y7054
3	Microprocessor, Intel Xeon E5507 2.26 GHz/4.8GTps QPI/800MHz-4MB 80W (quad core) (model A4x)			69Y0782
3	Microprocessor, Intel Xeon E5620 2.40 GHz/5.86GTps QPI/1066MHz-12MB 80W (quad core) (model G2x)			49Y7053
3	Microprocessor, Intel Xeon E5645 2.40 GHz/5.86GTps QPI/1333MHz-12MB 80W (six core)			69Y4714
3	Microprocessor, Intel Xeon E5540 2.53 GHz/1066MHz-8MB 80W (quad core) (model B4x)			46D1265

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
3	Microprocessor, Intel Xeon E5630 2.53 GHz/5.86GTps QPI/1066MHz-12MB 80W (quad core)			49Y7052
3	Microprocessor, Intel Xeon E5649 2.53 GHz/1333Mhz-12MB 80W (six core) (models B6x, E2x, D4x, 91x, and 92x)			81Y5955
3	Microprocessor, Intel Xeon E5640 2.66 GHz/5.86GTps QPI/1066MHz-12MB 80W (quad core) (models G4x, GDx, and EGx)			49Y7051
3	Microprocessor, Intel Xeon X5650 2.66 GHz/6.4GTps QPI/1333MHz-12MB 95W (six core) (models H2x and HAx)			49Y7040
3	Microprocessor, Intel Xeon X5660 2.80 GHz/6.4 GTps QPI/1333MHz-12MB 95W (six core) (models HXx and EHx)			49Y7039
3	Microprocessor, Intel Xeon X5570 2.93 GHz/1333MHz-8MB 95W (quad core) (models C4x and 1949-C4x)			46D1262
3	Microprocessor, Intel Xeon X5647 2.93 GHz/1066MHz-12MB 130W (quad core) (model B5x)			81Y5956
3	Microprocessor, Intel Xeon X5670 2.93 GHz/6.4 GTps QPI/1333MHz-12MB 95W (six core) (model H4x)			49Y7038
3	Microprocessor, Intel Xeon X5667 3.06 GHz/6.4 GTps QPI/1333MHz-12MB 95W (quad core) (model H5x)			49Y7050
3	Microprocessor, Intel Xeon X5675 3.06 GHz/1333MHz-12MB 95W (six core) (models C6x and E3x)			81Y5958
3	Microprocessor, Intel Xeon X5672 3.20 GHz/1333MHz-12M 95W (quad core) (model C5x)			81Y5957
3	Microprocessor, Intel Xeon X5680 3.33 GHz/6.4 GTps QPI/1333MHz-12MB 95W (six core) (model F2x)			69Y0849
3	Microprocessor, Intel Xeon X5677 3.46 GHz/6.4 GTps QPI/1333MHz-12MB 130W (quad core) (model F3x)			69Y0850
3	Microprocessor, Intel Xeon X5690 3.46 GHz/1333MHz-12MB 130W (six core) (model C8x)			81Y5960
3	Microprocessor, Intel Xeon X5687 3.60 GHz/1333MHz-12MB 130W (quad core) (model C7x)			81Y5959
4	Memory, 2 GB VLP PC3-10600 DDR3 1333MHz 1Rx8 1.5V	44T1584		
4	Memory, 4 GB VLP PC3-10600 DDR3 1333MHz 2Rx8 1.5V	44T1586		
4	Memory, 2 GB VLP PC3-10600 DDR3 1333MHz 1Rx8 1.35V	46C0572		
4	Memory, 2 GB VLP PC3-10600 DDR3 1333MHz 1Rx4 1.35V	46C0573		
4	Memory, 4 GB VLP PC3-10600 DDR3 1333MHz 1Rx4 1.35V	46C0575		
4	Memory, 4 GB VLP PC3-10600 DDR3 1333MHz 2Rx8 1.35V	46C0576		
4	Memory, 4 GB VLP PC3-10600 DDR3 1333MHz 2Rx4 1.35V	46C0579		
4	Memory, 8 GB VLP PC3-10600 DDR3 1333MHz 2Rx4 1.35V	46C0580		
4	Memory, 8 GB VLP PC3-10600 DDR3 1333MHz 2Rx4 1.35V	46C0581		
4	Memory, 1 GB VLP PC3-10600 DDR3 1333MHz 1Rx8 1.5V	49Y1437		
4	Memory, 2 GB VLP PC3-10600 DDR3 1333MHz 2Rx8 1.5V	49Y1438		
4	Memory, 2 GB VLP PC3-10600 DDR3 1333MHz 1Rx4 1.5V	49Y1439		
4	Memory, 4 GB VLP PC3-10600 DDR3 1333MHz 2Rx4 1.5V	49Y1440		

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
4	Memory, 8 GB VLP PC3-10600 DDR3 1333MHz 2Rx4 1.5V	49Y1441		
4	Memory, 16 GB VLP PC3-10600 DDR3 1333MHz 2Rx4 1.35V (for use with Intel Xeon 5600 series microprocessors)	49Y1528		
4	Memory, 16 GB VLP PC3-8500 DDR3 1066MHz 4Rx4 1.35V	90Y3223		
4	Memory, 8 GB VLP PC3L-10600 DDR3 1333MHz 1R x 4 1.35V (for use with Intel Xeon 5600 series microprocessors)	00D4983		
4	Memory, 8 GB VLP PC3L-10600 DDR3 1333MHz 2R x 8 1.35V (for use with Intel Xeon 5600 series microprocessors)	00D4987		
5	Memory, DIMM filler	60H2962		
6	Solid-state-drive (SSD) drive tray		59Y6424	
7	Solid-state-drive (SSD) storage drive, 50GB	43W7737		
8	Front bezel	46C7317		
9	Heat sink, microprocessor (Microprocessor 2)			46C7382
10	Heat sink filler	59Y6415		
11	Battery cover (included in miscellaneous parts kit)		43W8501	
12	Battery, 3.0 volt (all models)	33F8354		
13	Blade server base assembly (includes the system board without a microprocessor) (for models with Intel Xeon 5500 series microprocessors)			81Y6006
13	Blade server base assembly (includes the system board without a microprocessor) (models F2x, F3x, D4x, 91x, and 92x)			69Y4719
14	Expansion card, 2/4 Port Ethernet (CFFh) (option)	44W4488		
14	Expansion card, 4GB Fibre Channel CIOv (option)	46M6068		
14	Expansion card, 8GB Fibre Channel CIOv (option)	46M6138		
14	Expansion card, Broadcom 10 Gb 2-Port Ethernet (CFFh) (option)	44W4469		
14	Expansion card, Broadcom 10 Gb 4-Port Ethernet (CFFh) (option)	44W4472		
14	Expansion card, Broadcom 10 Gb Gen 2 2-port Ethernet Expansion Card (CFFh) (option)	46M6169		
14	Expansion card, Emulex Virtual Fabric Adapter (CFFh) for IBM BladeCenter (option)	49Y4239		
14	Expansion card, Emulex 10GbE Virtual Fabric Adapter Advanced II (CFFh) (Models D4x and 91x)	90Y3569		
14	Expansion card, Gigabit Ethernet CIOv (option)	44W4487		
14	Expansion card, Infiniband 4X DDR (CFFh) (option)	43W4425		
14	Expansion card, Intel 2 Port 10GbE (CFFh) (option)	42C1812		
14	Expansion card, QLogic (CFFh) Ethernet and 4 Gb Fibre Channel (option)	39Y9304		
14	Expansion card, SAS passthrough CIOv (option)	46C4069		
14	Expansion card, LSI 1078 RAID with battery backed cache CIOv (option)	46C7171		
14	Expansion card, QLogic Ethernet and 8 Gb Fibre Channel (CFFh) (option)	44X1943		

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
14	Expansion card, QLogic 8Gb Fibre Channel (CIOv) (option)	44X1948		
14	Expansion card, QLogic 2-port 10Gb Converged Network Adapter (CFFh) (Model 92x)	42C1832		
	ServeRAID MR10ie CIOv expansion card (option)	88Y6397		
	Alcohol Wipe Kit, Canada, Eng/Fr			59P4739
	IBM USB key for VMware ESXi	42D0545		
	Jumper, 12V	46M6763		
	Kit, miscellaneous parts (all models)		59Y6432	
	Label, system service	46C7297		
	Label, FRU list	46C7298		
	Label, Warning	90P4797		
	PCI I/O expansion unit III	43W4390		
	Thermal grease kit			41Y9292
	VMware ESXi 3.5	46D0762		
	VMware ESXi 3.5 Update 2	46M9236		
	VMware ESXi 3.5 Update 3	46M9237		
	VMware ESXi 3.5 Update 4	46M9238		
	VMware ESXi 3.5 Update 5	68Y9633		
	VMware ESXi 4.0	49Y8747		
	VMware ESXi 4.0 Update 1	68Y9634		
	VMware ESXi 4.1 (without USB key)	81Y2028		
	VMware ESXi 4.1 Update 1	95Y3065		
	Windows Server 2008 R2 Datacenter (2 CPU , 5 UserCAL), multilingual	59Y7332		
	Windows Server 2008 R2 Datacenter (2 CPU , 5 UserCAL), Simplified Chinese	59Y7333		
	Windows Server 2008 R2 Datacenter (2 CPU , 5 UserCAL), Traditional Chinese	59Y7334		
	Windows Server 2008 R2 Foundation (1 CPU), English	81Y2001		
	Windows Server 2008 R2 Foundation (1 CPU), French	81Y2002		
	Windows Server 2008 R2 Foundation (1 CPU), German	81Y2003		
	Windows Server 2008 R2 Foundation (1 CPU), Spanish	81Y2004		
	Windows Server 2008 R2 Foundation (1 CPU), Italian	81Y2005		
	Windows Server 2008 R2 Foundation (1 CPU), Brazilian	81Y2006		
	Windows Server 2008 R2 Foundation (1 CPU), Polish	81Y2007		
	Windows Server 2008 R2 Foundation (1 CPU), Russian	81Y2008		
	Windows Server 2008 R2 Foundation (1 CPU), Turkish	81Y2009		
	Windows Server 2008 R2 Foundation (1 CPU), Japanese	81Y2010		
	Windows Server 2008 R2 Foundation (1 CPU), Simplified Chinese	81Y2011		

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
	Windows Server 2008 R2 Foundation (1 CPU), Traditional Chinese	81Y2012		
	Windows Server 2008 R2 Foundation (1 CPU), Korean	81Y2013		
	Windows Server 2008 R2 Foundation (1 CPU), Czech	81Y2014		
	Windows Server 2008 R2 Standard (1-4 CPU, 5 CAL), multilingual	81Y2015		
	Windows Server 2008 R2 Standard (1-4 CPU, 5 CAL), Simplified Chinese	81Y2016		
	Windows Server 2008 R2 Standard (1-4 CPU, 5 CAL), Traditional Chinese	81Y2017		
	Windows Server 2008 R2 Enterprise (1-8 CPU, 10 CAL), multilingual	81Y2018		
	Windows Server 2008 R2 Enterprise (1-8 CPU, 10 CAL), Simplified Chinese	81Y2019		
	Windows Server 2008 R2 Enterprise (1-8 CPU, 10 CAL), Traditional Chinese	81Y2020		
	Windows Server 2008 R2 Enterprise (1-8 CPU, 25 CAL), multilingual	81Y2021		
	Windows Server 2008 R2 Enterprise (1-8 CPU, 25 CAL), Simplified Chinese	81Y2022		
	Windows Server 2008 R2 Enterprise (1-8 CPU, 25 CAL), Traditional Chinese	81Y2023		
	Windows Server 2008 R2 Datacenter Service Pack 1, multilingual	88Y7794		
	Windows Server 2008 R2 Datacenter Service Pack 1, Simplified Chinese	88Y7795		
	Windows Server 2008 R2 Datacenter Service Pack 1, Traditional Chinese	88Y7796		
	Windows Server 2008 R2 Foundation Service Pack 1, English	95Y3009		
	Windows Server 2008 R2 Foundation Service Pack 1, French	95Y3010		
	Windows Server 2008 R2 Foundation Service Pack 1, German	95Y3011		
	Windows Server 2008 R2 Foundation Service Pack 1, Spanish	95Y3012		
	Windows Server 2008 R2 Foundation Service Pack 1, Italian	95Y3013		
	Windows Server 2008 R2 Foundation Service Pack 1, Brazilian	95Y3014		
	Windows Server 2008 R2 Foundation Service Pack 1, Polish	95Y3015		
	Windows Server 2008 R2 Foundation Service Pack 1, Russian	95Y3016		
	Windows Server 2008 R2 Foundation Service Pack 1, Turkish	95Y3017		
	Windows Server 2008 R2 Foundation Service Pack 1, Japanese	95Y3018		
	Windows Server 2008 R2 Foundation Service Pack 1, Simplified Chinese	95Y3020		
	Windows Server 2008 R2 Foundation Service Pack 1, Traditional Chinese	95Y3021		
	Windows Server 2008 R2 Foundation Service Pack 1, Korean	95Y3022		
	Windows Server 2008 R2 Foundation Service Pack 1, Czech	95Y3023		

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
	Windows Server 2008 R2 Enterprise Service Pack 1, multilingual	95Y3024		
	Windows Server 2008 R2 Enterprise Service Pack 1, Simplified Chinese	95Y3025		
	Windows Server 2008 R2 Enterprise Service Pack 1, Traditional Chinese	95Y3026		
	Windows Server 2008 R2 Standard Service Pack 1, multilingual	95Y3027		
	Windows Server 2008 R2 Standard Service Pack 1, Simplified Chinese	95Y3028		
	Windows Server 2008 R2 Standard Service Pack 1, Traditional Chinese	95Y3029		
	Windows Storage Server 2008 R2 Standard, multilingual	95Y3213		
	Windows Storage Server 2008 R2 Enterprise, multilingual	95Y3214		

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 2. Consumable parts

Index	Description	Consumable part number
	Battery option for ServeRAID MR10ie CIOv expansion card (option)	88Y6397

To order a consumable part, complete the following steps:

1. Go to http://www.ibm.com.
2. From the **Products** menu, select **Upgrades, accessories & parts**.
3. Click **Obtain maintenance parts**; then, follow the instructions to order the part from the retail store.

If you need help with your order, call the toll-free number that is listed on the retail parts page, or contact your local IBM representative for assistance.

Chapter 5. Removing and replacing blade server components

Use this information to remove and replace components in the blade server.

Replaceable components are of three types:

- **Consumable parts:** 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 that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

See Chapter 4, “Parts listing, Types 7871 and 1949,” on page 41 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

Use these guidelines before you install the blade server or optional devices.

Before you install optional devices, read the following information:

- Before you begin, read “Safety” on page v and “Handling static-sensitive devices” on page 50. 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 HS22V** 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 optional devices for the blade server, see http://www.ibm.com/servers/eserver/serverproven/compat/us/.

System reliability guidelines

Use this information to make sure that the blade server meets the proper cooling and reliability guidelines.

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

- To ensure proper cooling, do not operate the BladeCenter unit without a blade server, expansion unit, or blade filler installed in each blade-server bay. See the documentation for your BladeCenter unit for additional information.
- Each microprocessor socket always contains either a microprocessor dust cover and 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.
- Each DIMM socket always contains a memory module or filler.
- Make sure that the ventilation holes on the blade server are not blocked.
- The blade server battery must be operational. If the battery becomes defective, replace it immediately.

Handling static-sensitive devices

Use this information to observe the static-sensitive device requirements.

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, especially 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 its static-protective package, touch it to an *unpainted* metal part of the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component in the rack in which you are installing the device for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the blade server without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the blade server cover or on a metal surface.
- Take additional care when you handle devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Returning a device or component

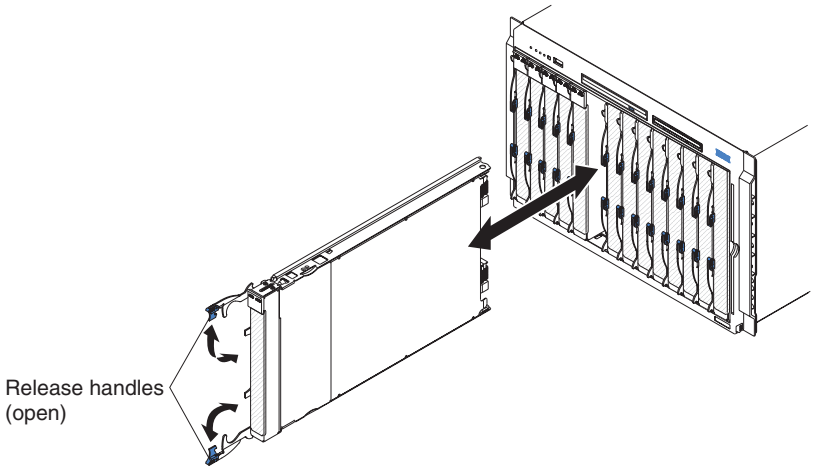
Use this information for instructions to return a device or component to service and support.

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 the BladeCenter unit

Use these instructions to remove the blade server from the BladeCenter unit.

The following illustration shows how to remove a single-width type of blade server or blade filler from a Type 8677 BladeCenter unit. The appearance of your BladeCenter unit might be different; see the documentation for your BladeCenter unit for additional information.



Attention:

- To maintain proper system cooling, do not operate the BladeCenter unit without a blade server, expansion unit, or filler module installed in each blade server bay.
- When you remove the blade server, note the blade-server bay number. Reinstalling a blade server into a different blade server bay from the one it was removed from can have unintended consequences. Some configuration information and update options are established according to blade-server 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, complete the following steps:

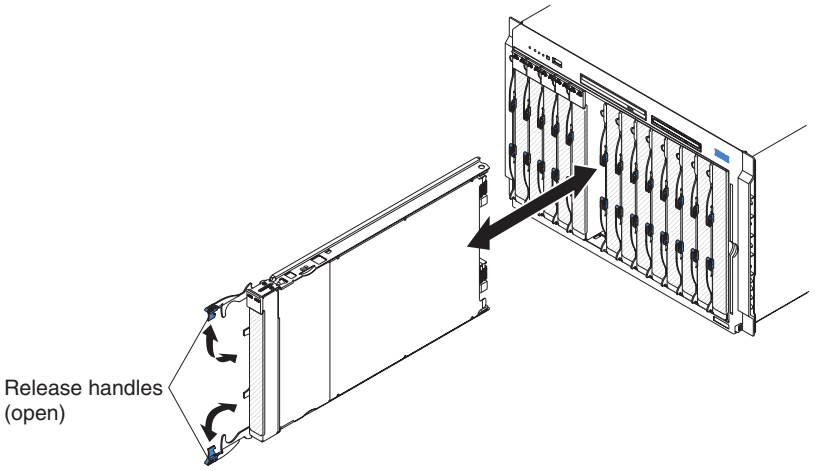
1. If the blade server is operating, shut down the operating system (see the documentation for your operating system for more information).
2. If the server is still on, press the power-control button for four seconds to turn off the blade server (see "Turning off the blade server" on page 13 for more information).

   Attention: Wait at least 30 seconds, until the storage devices stops spinning, before you proceed to the next step.
3. Open the two release handles as shown in the illustration. The blade server moves out of the blade server bay approximately 0.6 cm (0.25 inch).
4. Pull the blade server out of the bay.
5. Place either a blade filler or another blade server in the blade server bay within 1 minute.

Installing the blade server in a BladeCenter unit

Use these instructions to install the blade server in a BladeCenter unit.

The following illustration shows how to install a blade server into a BladeCenter unit. The appearance of your BladeCenter unit might be different; see the documentation for your BladeCenter unit for additional information. To install a blade server in a BladeCenter unit, 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.

1. Before you begin, read "Safety" on page v and "Installation guidelines" on page 49.
2. Select the blade bay for the blade server; at least one blade bay is required.

   Notes:

   a. When any blade server or device is in blade bay 7 through 14, power modules must be installed in all four power-module bays. For additional information, see the *Installation and User's Guide* that comes with the BladeCenter unit.

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

   c. To help ensure proper cooling, performance, and system reliability, make sure that each blade bay on the front of the BladeCenter unit contains a

blade server, expansion unit, or blade filler. Do not operate a BladeCenter unit for more than 1 minute without a blade server, expansion unit, or blade filler in each blade bay.

3. Make sure that the release handles on the blade server are in the open position (perpendicular to the blade server).
4. Slide the blade server into the blade bay until it stops.
5. Push the release handles on the front of the blade server to the closed position.

   Note: After the blade server is installed, the service processor in the blade server initializes and synchronizes with the management module. This process takes approximately two minutes to complete. The power-on LED flashes rapidly, and the power-control button on the blade server does not respond until this process is complete.
6. Turn on the blade server (see "Turning on the blade server" on page 13 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. If you have other blade servers to install, do so now.
9. 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.
10. Reinstall the bezel assembly on the BladeCenter T unit (BladeCenter T unit only). 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 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 customer replaceable units (CRUs)

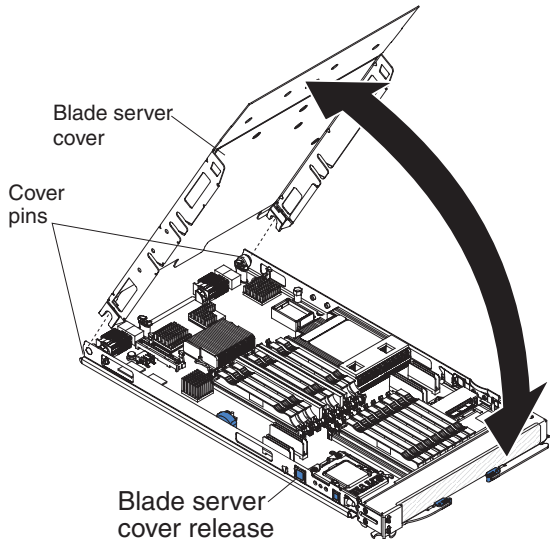
Use this information for removing and replacing Tier 1 CRUs.

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.

Removing the blade server cover

Use these instructions to open the blade server cover.

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



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

1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 52 for instructions).
3. Carefully lay the blade server on a flat, static-protective surface, with the cover side up.
4. Press the blade server cover release on each side of the blade server or expansion unit and lift the cover open, as shown in the illustration.
5. Lay the cover flat, or lift it from the blade server and store for future use.

Statement 21

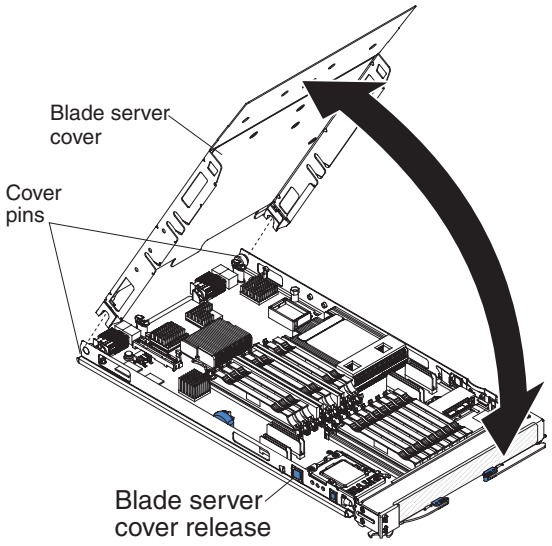
CAUTION:
Hazardous energy is present when the blade server is connected to the power source. Always replace the blade cover before installing the blade server.

Closing the blade server cover

Use these instructions for information about how to close the blade server cover.

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

To close the blade server cover, complete the following steps:

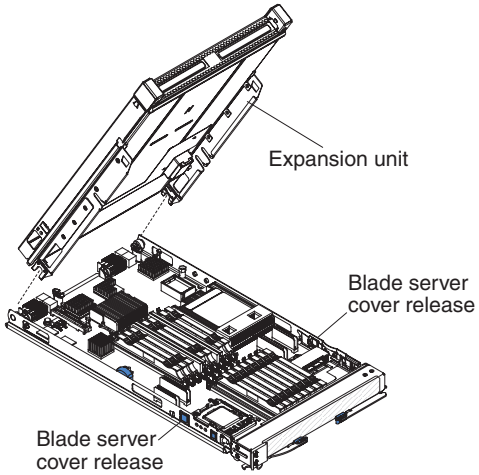


1. If you removed an expansion unit from the blade server, install it now (see "Installing an optional expansion unit" on page 58).
2. Lower the cover so that the slots at the rear slide down onto the pins at the rear of the blade server, as shown in the illustration. Before you close the cover, make sure 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, as shown in the illustration, 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 53).

Removing an optional expansion unit

Use these instructions to remove the optional expansion unit from the blade server.

To remove an optional expansion unit, complete the following steps:



1. Before you begin, read "Safety" on page v and "Installation guidelines" on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from the BladeCenter unit" on page 52 for instructions).
3. Carefully lay the blade server 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 55 for instructions).
5. Remove the expansion unit:
   a. If the expansion unit has an extraction device, use the extraction device to disengage the expansion unit from the blade server. These extraction devices can be of several types, including thumbscrews or levers.
   b. If the expansion unit does not have an extraction device, press the blade server cover release on each side of the blade server and lift the expansion unit from the blade server.
   c. Rotate the expansion unit open; then, lift the expansion unit from the blade server.
6. If you are instructed to return the expansion unit, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing an optional expansion unit

Use these instructions to install an optional expansion unit.

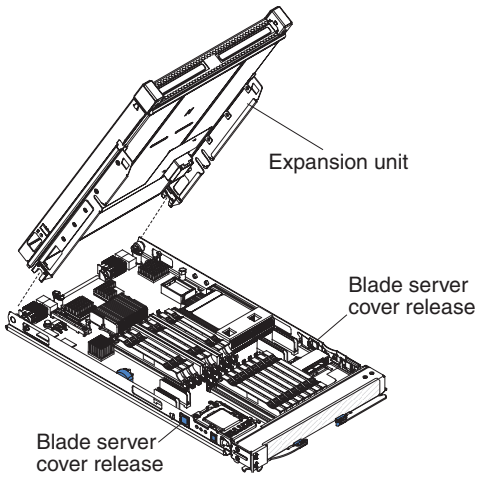
The optional expansion units supported for this blade server are the PCI Express I/O expansion unit.

Attention: If a horizontal combination-form-factor (CFFh) expansion card is installed on the blade server system board, you cannot install an optional expansion unit.

Notes:

1. The following illustration shows an optional expansion unit in a blade server.
2. The illustrations in this document might differ slightly from your hardware.

To install an optional expansion unit, complete the following steps.



1. Locate the blade expansion connector and remove the cover if one is installed (see "Blade server connectors" on page 14).
2. Touch the static-protective package that contains the optional 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 optional expansion unit from the package.
3. Orient the optional expansion unit as shown in the illustration.
4. Lower the expansion unit so that the slots at the rear slide down onto the cover pins at the rear of the blade server; then, pivot the expansion unit down onto the blade server.
5. If the expansion unit has an extraction device (such as a thumbscrew or a lever), use it to fully engage the expansion unit on the blade server; otherwise, press the expansion unit firmly into the closed position until it clicks into place.
6. Install the cover onto the blade server (see "Closing the blade server cover" on page 56).
7. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 53).

Removing the bezel assembly

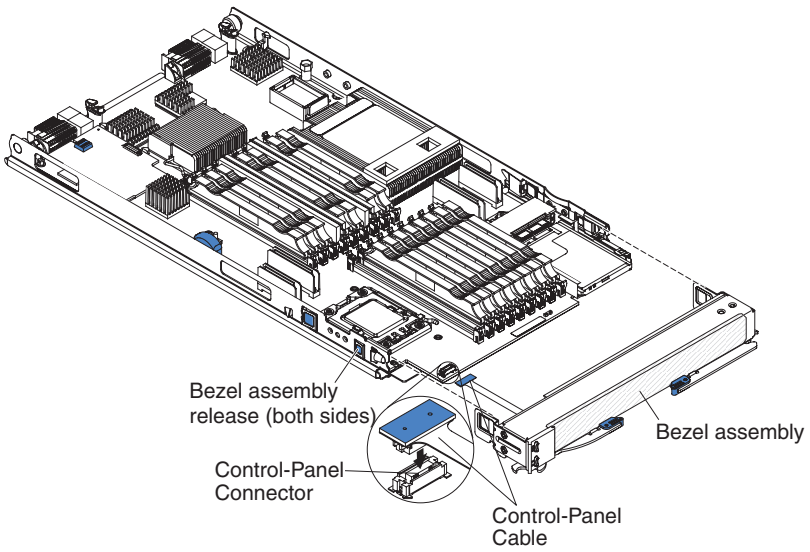
Use this information to remove the bezel assemble from the blade server.

The following illustration shows how to remove a bezel assembly from a blade server.

Note:

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

To remove the bezel assembly, complete the following steps.



1. Before you begin, read "Safety" on page v and "Installation guidelines" on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from the BladeCenter unit" on page 52 for instructions).
3. Open the blade server cover (see "Removing the blade server cover" on page 55 for instructions).
4. If an optional expansion unit is installed, remove it (see "Removing an optional expansion unit" on page 57).
5. Carefully lay the blade server on a flat, static-protective surface.
6. 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).
7. If you are removing the bezel assembly from a blade server, disconnect the control-panel cable from the control-panel connector by lifting up on the control-panel cable.

   Note: Some hardware installation and removal procedures that refer to this removal process do not require the control-panel cable to be removed. For example, the DIMM connectors can be accessed without removing the control-panel cable.
8. Pull the bezel assembly away from the blade server.
9. If you are instructed to return the bezel assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

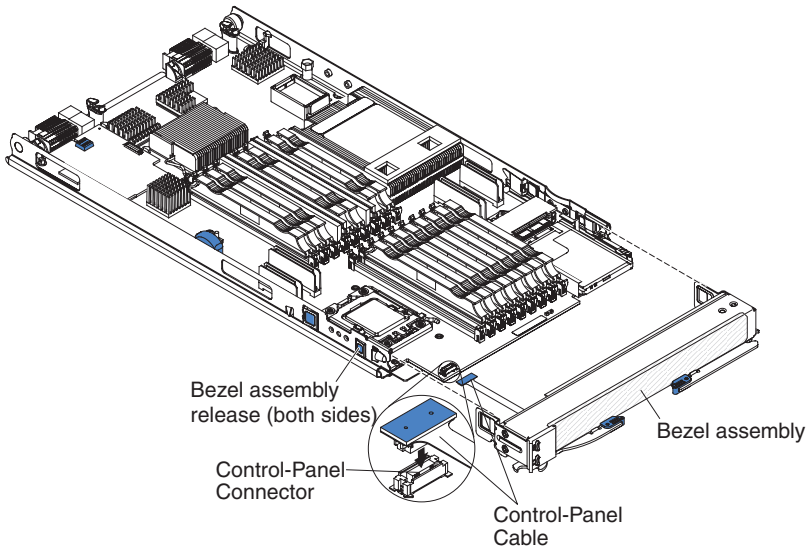
Installing the bezel assembly

Use this information to install a bezel assembly in the blade server.

Note:

1. The following illustration shows how to install a bezel assembly in a blade server.
2. The illustrations in this document might differ slightly from your hardware.

To install the bezel assembly, complete the following steps.



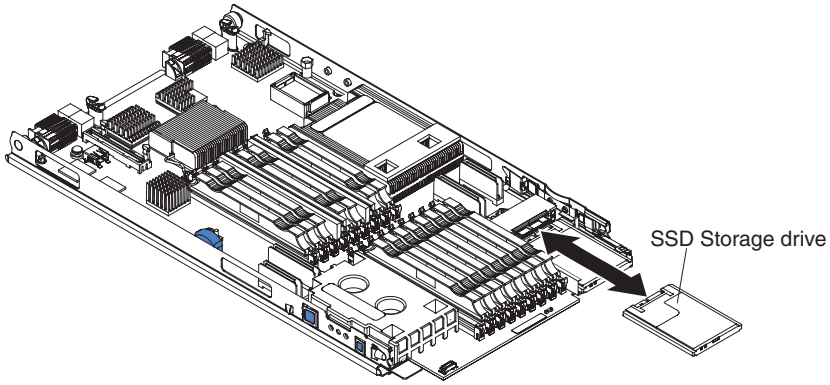
1. Orient the bezel with the front of the blade server.
2. If the control-panel cable is not already installed, connect the control-panel cable to the control-panel connector on the blade server.

   Note: Some hardware installation and removal procedures that refer to this installation process do not require the control-panel cable to be installed. For example, the DIMM connectors can be accessed without removing and reinstalling the control-panel cable.
3. Carefully slide the bezel assembly onto the blade server until it clicks into place.
4. Install the optional expansion unit, if you removed one from the blade server (see “Installing an optional expansion unit” on page 58 for instructions).
5. Install the cover onto the blade server (see “Closing the blade server cover” on page 56).
6. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 53).

Removing a SSD storage drive

Use this information to remove an SSD storage drive.

The blade server has two SSD storage bays. To remove an SSD storage drive, complete the following steps.



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 49.
2. Remove the blade server from the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 52).
3. Remove the cover from the blade server (see “Removing the blade server cover” on page 55).
4. If an expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 57).
5. Remove the front bezel from the blade server (see “Removing the bezel assembly” on page 59).

   Attention: When you remove an SSD drive, use a felt-tip pen to write which SSD connector the drive was removed from on the drive label. Installing an SSD drive into a different SSD connector can damage the RAID configuration.

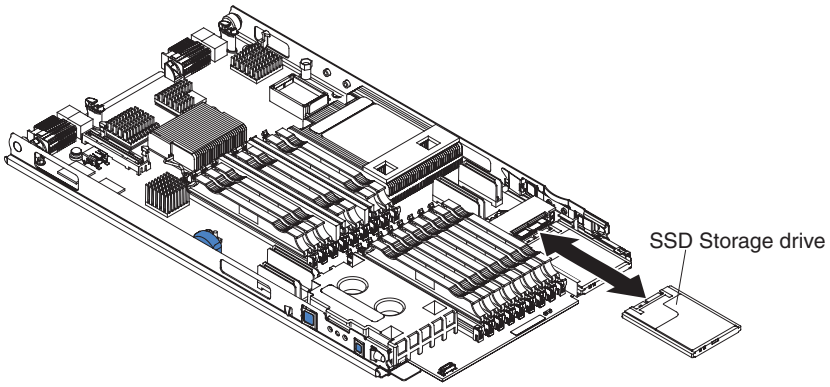
   Note: If there is an SSD drive in SSD connector 1, it must be removed before you can remove the SSD drive in SSD connector 0. SSD connector 1 is on top of SSD connector 0.
6. Locate the SSD storage drive you want to remove; then, press the release button to eject the SSD drive (see “Blade server connectors” on page 14).
7. Use your fingers to pull the SSD drive out of the SSD connector.
8. If you are instructed to return the storage drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a SSD storage drive

Use these instructions to install an SSD storage drive into the blade server.

The blade server has two SSD storage bays for installing SSD storage drives. One storage drive might already be installed in the blade server in storage bay 0. If the blade server is equipped with one storage drive, you can install an additional drive in storage bay 1. The blade server supports using RAID 0 or RAID 1 when two storage drives of the same interface type are installed. See "Configuring a RAID array" on page 35 for information about RAID configuration.

To install an SSD storage drive, complete the following steps.



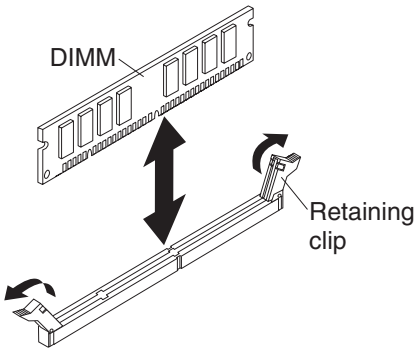
1. Identify the SSD storage bay (storage bay 0 or storage bay 1) in which the storage drive will be installed (see "Blade server connectors" on page 14).

   Attention: To maintain a RAID array, an SSD storage drive must be installed into the same SSD connector it was removed from.
2. Touch the static-protective package that contains the storage 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.
3. Slide the SSD storage drive into the storage bay until it is firmly seated in the connector.
4. Install the front bezel onto the blade server (see "Installing the bezel assembly" on page 60).
5. If an expansion was installed, install the expansion unit (see "Installing an optional expansion unit" on page 58).
6. Install the cover onto the blade server (see "Closing the blade server cover" on page 56).
7. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 53).

Removing a memory module

Use this information to remove a memory module from the blade server.

The following illustration shows how to remove a DIMM from the blade server. This information also applies to removing a DIMM filler.



To remove a DIMM, complete the following steps.

1. Before you begin, read "Safety" on page v and "Installation guidelines" on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from the BladeCenter unit" on page 52).
3. Remove the blade server cover (see "Removing the blade server cover" on page 55).
4. If an optional expansion unit is installed, remove the expansion unit (see "Removing an optional expansion unit" on page 57).
5. Locate the DIMM connectors (see "Blade server connectors" on page 14). 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.

   Note: To access DIMM connector ten through eighteen, remove the front bezel (see "Removing the bezel assembly" on page 59).
6. Move the retaining clips on the ends of the DIMM connector to the open position by pressing the retaining clips away from the center of the DIMM connector.
7. Using your fingers, pull the DIMM out of the connector.
8. Install a DIMM or DIMM filler in each empty DIMM connector (see "Installing a memory module" on page 64).

   Note: A DIMM or DIMM filler must occupy each DIMM socket before the blade server is turned on.
9. 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

Use these instructions to install memory modules in the blade server.

The blade server has a total of eighteen direct inline memory module (DIMM) slots. The blade server supports very low profile (VLP) DDR3 DIMMs with error code correction (ECC). For a current list of supported DIMMs for the blade server, see http://www.ibm.com/servers/eserver/serverproven/compat/us/.

After you install or remove a DIMM, you must change and save the new configuration information by using the Setup utility. When you turn on the blade server, a message indicates that the memory configuration has changed. Start the Setup utility and select **Save Settings** (see "Setup utility menu" on page 20 for more information) to save changes.

Depending on the memory mode that is set in the Setup utility, the blade server can support a minimum of 1 GB and a maximum of 144 GB of system memory on the system board in a blade server with one processor. If two microprocessors are installed, the blade server can support a minimum of 2 GB and a maximum of 288 GB of system memory.

Before you install the quad-rank DIMMs, read the following information:

- Quad-rank DIMMs must be installed first. You can install up to two quad-rank DIMMs per channel.
- DIMM connectors 1, 4, 7, 10, 13, and 16 are not supported when a quad-rank DIMM is installed. The maximum number of DIMMs supported is 12 (two microprocessors installed).

There are three different memory modes:

- **Independent channel mode:** Independent channel mode gives a maximum of 144 GB of usable memory with one microprocessor installed, and 288 GB of usable memory with 2 microprocessors installed (using 16 GB dual-rank DIMMs). The DIMMs can be installed without matching sizes. See the table below for the memory installation order.

Table 3. System memory configuration for independent channel mode **(1 microprocessor)**

Installed memory	DIMM connector																	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
1 DIMM			X															
2 DIMMs			X			X												
3 DIMMs			X			X			X									
4 DIMMs		X	X			X			X									
5 DIMMs		X	X		X	X			X									
6 DIMMs		X	X		X	X		X	X									
7 DIMMs	X_1	X	X		X	X		X	X									
8 DIMMs	X_1	X	X	X_1	X	X		X	X									

Table 3. System memory configuration for independent channel mode **(1 microprocessor)** *(continued)*

Installed memory	**DIMM connector**																	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
9 DIMMs	X[1]	X	X	X[1]	X	X	X[1]	X	X									

1. Not supported when a quad-rank DIMM is installed.

Table 4. System memory configuration for independent channel mode **(2 microprocessors)**

Installed memory	DIMM connector																	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
2 DIMMs			X									X						
3 DIMMs			X			X						X						
4 DIMMs			X			X						X			X			
5 DIMMs			X			X			X			X			X			
6 DIMMs			X			X			X			X			X			X
7 DIMMs		X	X			X			X			X			X			X
8 DIMMs		X	X			X			X		X	X			X			X
9 DIMMs		X	X		X	X			X		X	X			X			X
10 DIMMs		X	X		X	X			X		X	X		X	X			X
11 DIMMs		X	X		X	X		X	X		X	X		X	X			X
12 DIMMs		X	X		X	X		X	X		X	X		X	X		X	X
13 DIMMs	X[1]	X	X		X	X		X	X		X	X		X	X		X	X
14 DIMMs	X[1]	X	X		X	X		X	X	X[1]	X	X		X	X		X	X
15 DIMMs	X[1]	X	X	X[1]	X	X		X	X	X[1]	X	X		X	X		X	X
16 DIMMs	X[1]	X	X	X[1]	X	X		X	X	X[1]	X	X	X[1]	X	X		X	X
17 DIMMs	X[1]	X	X	X[1]	X	X	X[1]	X	X	X[1]	X	X	X[1]	X	X		X	X
18 DIMMs	X[1]	X	X	X[1]	X	X	X[1]	X	X	X[1]	X	X	X[1]	X	X	X[1]	X	X

1. Not supported when a quad-rank DIMM is installed.

- **Mirrored channel mode:** In mirrored channel mode, channels 2 is not used. The memory contents on channel 0 are duplicated in channel 1. The effective memory available to the system is only half of that installed. The maximum available memory (with 16 GB dual-rank DIMMs) is 48 GB for a single-microprocessor system and 96 GB for a dual-microprocessor system.

  The following table shows the order that memory DIMMs are installed to use a mirrored channel mode.

Table 5. System memory configuration for mirrored channel mode **(1 microprocessor)**

Installed memory	DIMM socket																	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
2 DIMMs			X						X									
4 DIMMs		X	X					X	X									
6 DIMMs	X_1	X	X				X_1	X	X									

1. Not supported when a quad-rank DIMM is installed.

Table 6. System memory configuration for mirrored channel mode **(2 microprocessors)**

Installed memory	DIMM socket																	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
4 DIMMs			X						X			X						X
6 DIMMs		X	X					X	X			X						X
8 DIMMs		X	X					X	X		X	X					X	X
10 DIMMs	X_1	X	X				X_1	X	X		X	X					X	X
12 DIMMs	X_1	X	X				X_1	X	X	X_1	X	X				X_1	X	X

1. Not supported when a quad-rank DIMM is installed.

- **Spare channel mode:** In Spare Channel Mode, channel 2 is the spare of the active channels 0 and 1. Channel 5 is the spare of the active channels 3 and 4. The spare channel is not available as active memory. When using spare channel mode, two-thirds of the installed memory is available as active memory. The maximum memory available (with 16 GB dual-rank DIMMs) is 96GB in a single-microprocessor system and 96 GB in a dual-microprocessor system. All three channels must have identical population with regards to size and organization. DIMMs within a channel do not have to be identical. The population ordering for Spare Channel Mode is shown in the table below.

  Note: Spare channel mode is only supported if the blade server has an Intel Xeon 5600 series microprocessor. Use the Setup utility to view the system summary and verify the type of microprocessor installed in your blade server (see "Using the Setup utility" on page 20).

  The following table shows the order that memory DIMMs are installed to use spare channel mode.

Table 7. System memory configuration for spare channel mode **(1 microprocessor)**

Installed memory	DIMM socket																	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
3 DIMMs			X			X			X									
6 DIMMs		X	X		X	X		X	X									
9 DIMMs	X[1]	X	X	X[1]	X	X	X[1]	X	X									

1. Not supported when a quad-rank DIMM is installed.

Table 8. System memory configuration for spare channel mode **(2 microprocessors)**

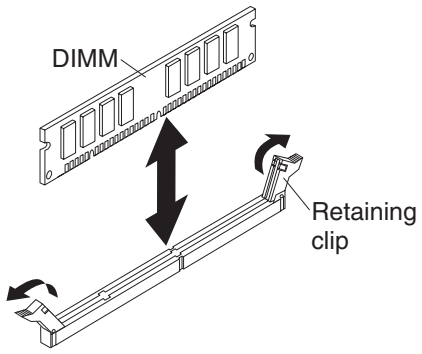
Installed memory	DIMM socket																	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
6 DIMMs			X			X			X			X			X			X
9 DIMMs		X	X		X	X		X	X			X			X			X
12 DIMMs		X	X		X	X		X	X		X	X		X	X		X	X
15 DIMMs	X[1]	X	X	X[1]	X	X	X[1]	X	X		X	X		X	X		X	X
18 DIMMs	X[1]	X	X	X[1]	X	X	X[1]	X	X	X[1]	X	X	X[1]	X	X	X[1]	X	X

1. Not supported when a quad-rank DIMM is installed.

To install a DIMM, complete the following steps:

1. Locate the DIMM connectors (see "Blade server connectors" on page 14). Determine which DIMM connectors you will be installing memory into.
2. If you are installing a DIMM in DIMM connectors ten through eighteen, remove the front bezel (see "Removing the bezel assembly" on page 59).
3. If a DIMM filler or another memory module is already installed in the DIMM connectors, remove them (see "Removing a memory module" on page 63).

   Note: A DIMM or DIMM filler must occupy each DIMM socket before the blade server is turned on.
4. To install the DIMMs, repeat the following steps for each DIMM that you install:



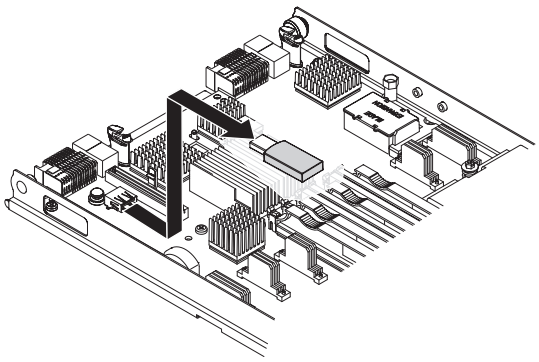
   a. Make sure that the retaining clips are in the open position, away from the center of the DIMM connector.
   b. Touch the static-protective package that contains the DIMM to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component in the rack in which you are installing the DIMM for at least two seconds; then, remove the DIMM from its package.
   c. Turn the DIMM so that the DIMM keys align correctly with the DIMM connector on the system board.

      Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.
   d. Press the DIMM into the DIMM connector. The retaining clips will lock the DIMM into the connector.
   e. Make sure that the small tabs on the retaining clips are in the notches on the DIMM. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly installed. Press the DIMM firmly into the connector, and then press the retaining clips toward the DIMM until the tabs are fully seated. When the DIMM is correctly installed, the retaining clips are parallel to the sides of the DIMM.
5. If the front bezel has been removed, install it now (see "Installing the bezel assembly" on page 60).
6. Install the cover onto the blade server (see "Closing the blade server cover" on page 56).
7. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 53).

Removing a USB Flash key

Use this information to remove a USB Flash key from the blade server.

The following illustration shows the removal of a USB Flash key from the blade server.



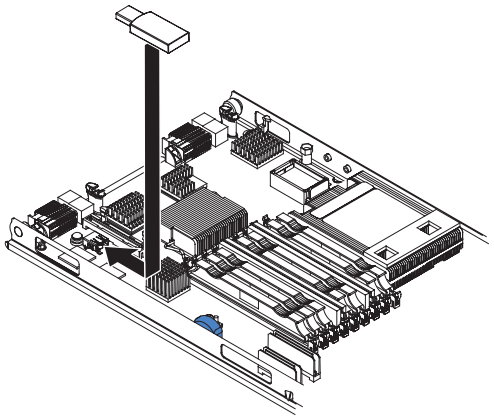
To remove the USB Flash key, complete the following steps.

1. Before you begin, read "Safety" on page v and "Installation guidelines" on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from the BladeCenter unit" on page 52).
3. Remove the blade server cover (see "Removing the blade server cover" on page 55).
4. If an optional expansion unit is installed, remove the expansion unit (see "Removing an optional expansion unit" on page 57).
5. If an optional CIOv expansion card is installed, remove the CIOv expansion card (see "Removing a CIOv-form-factor expansion card" on page 74).
6. Locate the USB Flash key on the system board (see "Blade server connectors" on page 14).
7. Using your fingers, push the USB Flash key out of the connector. It is recommended to use your finger to push the shoulder of the USB Flash key away from the connector.
8. If you are instructed to return the USB Flash key, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a USB Flash key

Use these instructions to install a USB Flash key in the blade server.

The following illustration shows the installation of the USB Flash key.

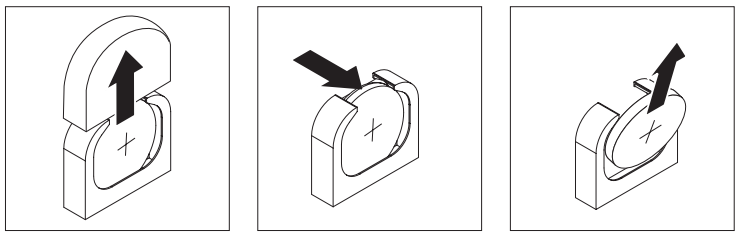


To install a USB module, complete the following steps:

1. If a CIOv expansion card is installed, remove the expansion card (see "Removing a CIOv-form-factor expansion card" on page 74).
2. Locate the USB connector on the blade server (see "Blade server connectors" on page 14).
3. Touch the static-protective package that contains the USB Flash key to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component in the rack in which you are installing the USB module for at least two seconds; then, remove the USB module from its package.
4. Orient the connector on the USB Flash key with the USB connector on the blade server.
5. Use your fingers to push the USB Flash key into the USB connector on the blade server.
6. If a CIOv expansion card was removed during the install process, install the expansion card (see "Installing a CIOv-form-factor expansion card" on page 78).
7. Install the cover onto the blade server (see "Closing the blade server cover" on page 56).
8. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 53).

Removing the battery

Use this information to remove the battery from the blade server.



To remove the battery, complete the following steps.

1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 52 for instructions).
3. Remove the blade server cover (see “Removing the blade server cover” on page 55 for instructions).
4. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 57).
5. Locate the battery on the system board.
6. If there is a rubber cover on the battery holder, use your fingers to lift the battery cover from the battery connector.
7. Release the battery by using your finger to press the top of the battery towards the middle of the blade server and out of the battery connector.
8. Use your thumb and index finger to lift the battery from the socket.
9. Dispose of the battery as required by local ordinances or regulations.

Installing the battery

Use this information to install a battery on the system board in the blade server.

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

- You must replace the battery 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 blade 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**

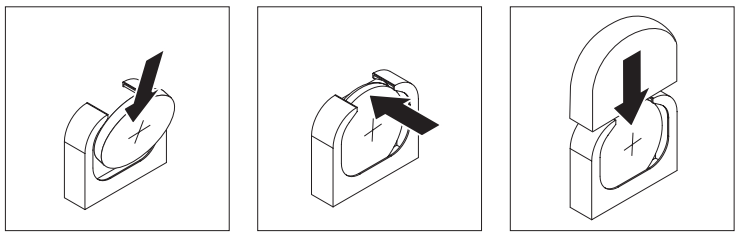
Dispose of the battery as required by local ordinances or regulations.

Note:

1. The following illustration shows how to install the battery in the system board.
2. The illustrations in this document might differ slightly from your hardware.

To install the battery, complete the following steps:

1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 52 for instructions).
3. Remove the blade server cover (see “Removing the blade server cover” on page 55 for instructions).
4. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 57 for instructions).
5. Follow any special handling and installation instructions that come with the battery.
6. Locate the battery connector on the system board (see “Blade server connectors” on page 14).
7. Orient the battery so that the positive (+) side faces in towards the center of the blade server.
8. Tilt the battery so that you can insert it into the bottom of the socket.
9. As you slide the battery into place, press the top of the battery into the socket.



10. If you removed a rubber cover from the battery holder, use your fingers to install the battery cover on top of the battery connector.
11. Install the optional expansion unit, if you removed one from the blade server to replace the battery (see “Installing an optional expansion unit” on page 58 for instructions).
12. Install the cover onto the blade server (see “Closing the blade server cover” on page 56).
13. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 53).
14. Turn on the blade server, start the Setup utility, and reset the configuration (see “Using the Setup utility” on page 20 for instructions).

Removing an I/O expansion card

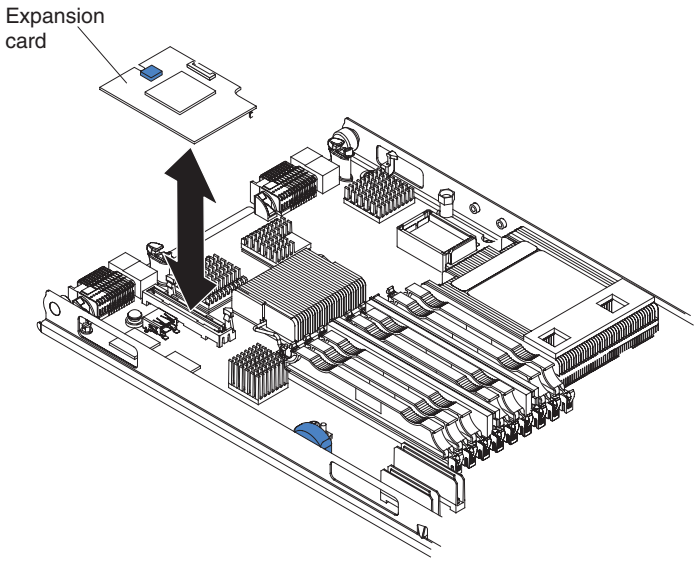
The following sections describe how to remove the following expansion cards:

- vertical-combination-I/O (CIOv)
- horizontal-combination-form-factor (CFFh)
- CIOv storage interface card

Removing a CIOv-form-factor expansion card

Use these instructions to remove a CIOv-form-factor expansion card from the blade server.

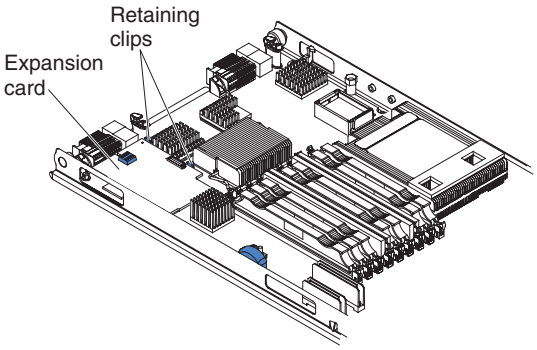
The following illustration shows how to remove a vertical-combination-I/O (CIOv) expansion card.



To remove a CIOv expansion card, complete the following steps:

1. Before you begin, read "Safety" on page v and "Installation guidelines" on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from the BladeCenter unit" on page 52 for instructions).
3. Carefully lay the blade server on a flat, static-protective surface.
4. Open the blade server cover (see "Removing the blade server cover" on page 55 for instructions).
5. If an optional expansion unit is installed, remove the expansion unit (see "Removing an optional expansion unit" on page 57).

6. Locate the CIOv expansion connector (see “Blade server connectors” on page 14).

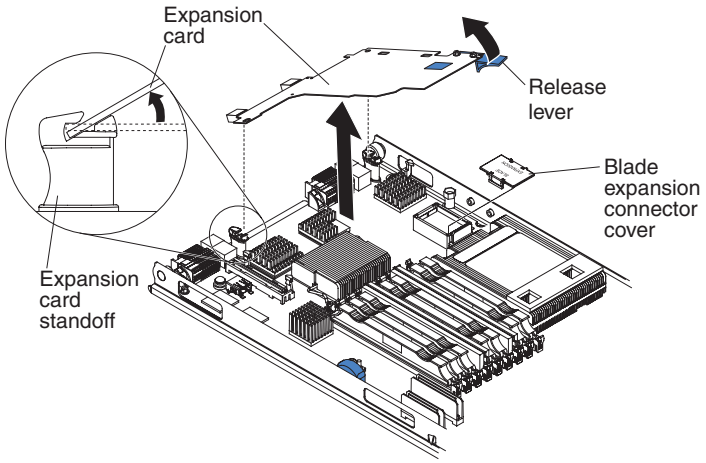


7. Using your fingers, move the retaining clips away from the CIOv card; then, lift the card out of the connector.

Removing a horizontal-combination-form-factor expansion card

Use these instructions to remove a horizontal-combination-form-factor expansion card from the blade server.

The following illustration shows how to remove a horizontal-compact-form-factor (CFFh) expansion card.



To remove a CFFh expansion card, complete the following steps:

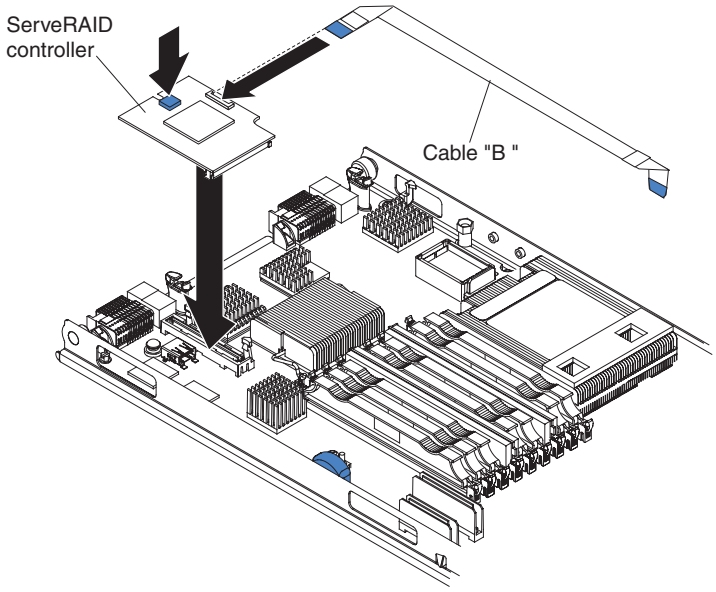
1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 52 for instructions).
3. Carefully lay the blade server on a flat, static-protective surface.
4. Open the blade server cover (see “Removing the blade server cover” on page 55 for instructions).
5. Locate the CFFh expansion card. The CFFh is installed into the blade expansion connector (see “Blade server connectors” on page 14).
6. Locate the release lever on the CFFh expansion card; then, use your finger to lift up on the release lever to loosen the expansion card from the expansion connector.

7. Use your fingers to hold the edge of the CFFh expansion card where it connects to the blade expansion connector; then, lift up on the card.
8. Pull the card away from the expansion-card standoff.

Removing a storage interface card

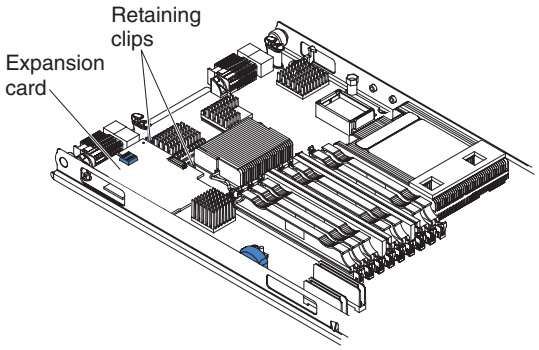
Use this information to remove a storage interface card from the blade server.

The storage interface card controls the SAS storage drives. The following illustrations and installation instructions show how to remove a ServeRAID-MR10ie CIOv storage interface card from the blade server. The illustrations and removal instructions are similar for other CIOv storage interface cards.



To remove a storage interface card, complete the following steps.

1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 52 for instructions).
3. Remove the blade server cover (see “Removing the blade server cover” on page 55 for instructions).
4. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 57). The storage-interface-card option includes the storage interface card, backup battery, and backup-battery cable. These parts can be removed separately from each other.
5. To remove the storage interface card, complete the following steps.
   a. Locate the storage interface card installed in the CIOv connector on the system board (see “Blade server connectors” on page 14).



b. Gently push the retaining clips away from the expansion card; then, lift the card out of the expansion-card connector.

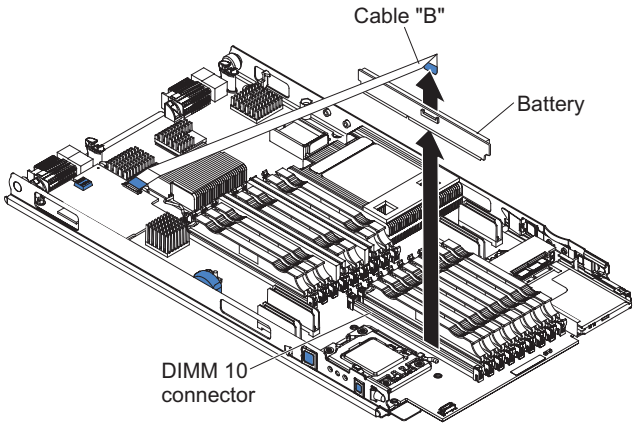
c. Remove the cable from the storage interface card by holding the card in one hand; then, use your other hand to pull the cable away from the card. When pulling the cable, make sure that you hold the cable where there is a blue touchpoint.

6. To remove the backup-battery cable, complete the following steps.

   a. Remove the cable from the storage interface card by holding the blue touchpoint on the cable; then, pull the cable away from the card.

   b. Remove the cable from the backup battery by holding the blue touchpoint on the cable; then, pull the cable away from the backup battery.

7. The backup battery is installed in DIMM connector ten. To remove the backup battery, complete the following steps.



   a. If you have not already done so, remove the backup-battery cable from the backup battery by holding the blue touchpoint on the cable; then, pull the cable away from the backup battery.

   b. Remove the backup battery from the DIMM connector ten by using the instructions to remove a memory module (see “Removing a memory module” on page 63).

8. Remove the backup battery from DIMM connector ten.

9. If you are instructed to return the storage interface card, backup battery, or the backup-battery cable; then, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing an I/O expansion card

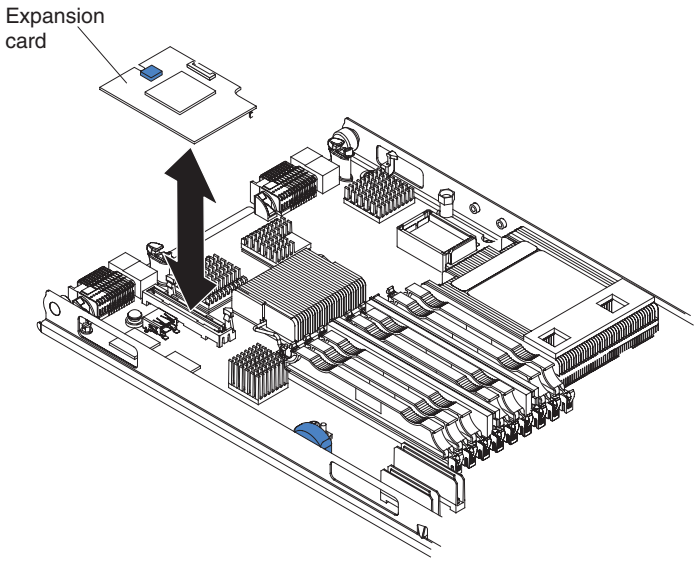
The following sections describe how to install the following expansion cards:

- vertical-combination-I/O (CIOv)
- horizontal-combination-form-factor (CFFh)
- CIOv storage interface card

Installing a CIOv-form-factor expansion card

Use these instructions to install a CIOv-form-factor expansion card in the blade server.

The following illustration shows the location and installation of a CIOv expansion card.



Attention: Before you install one of the following CIOv expansion cards in the blade server, make sure the PCIe speed is set to Gen1. You can configure the PCIe speed in the Setup utility by selecting **System Settings** and **Devices and I/O Ports**.

- Ethernet Expansion Card (CIOv) for IBM BladeCenter
- QLogic 4 Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter
- SAS Connectivity Card (CIOv) for IBM BladeCenter
- ServeRAID-MR10ie (CIOv) Controller for IBM BladeCenter

To install a CIOv expansion card, complete the following steps:

1. Locate the CIOv expansion connector (see "Blade server connectors" on page 14).
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 connector on the expansion card with the CIOv expansion connector on the system board; then, press the card into the CIOv 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.

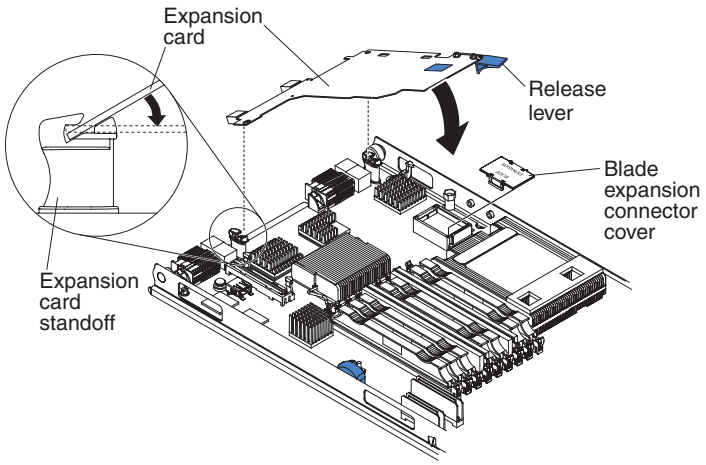
5. Install the cover onto the blade server (see "Closing the blade server cover" on page 56).
6. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 53).

Installing a horizontal-combination-form-factor expansion card

Use these instructions to install a horizontal-combination-form-factor expansion card in the blade server.

The following illustration shows how to install a horizontal-combination-form-factor (CFFh) expansion card.

Attention: Do not install a CFFh expansion card in the blade server if an expansion unit will be installed. The CFFh expansion card uses the blade-expansion connector on your blade server.



Attention: Before you install one of the following CFFh expansion cards in the blade server, make sure the PCIe speed is set to Gen1. You can configure the PCIe speed in the Setup utility by selecting **System Settings** and **Devices and I/O Ports**.

- 2/4 Port Ethernet Expansion Card for BladeCenter
- Broadcom 10 Gb 2-port Ethernet Expansion Card (CFFh) for IBM BladeCenter
- Broadcom 10 Gb 4-port Ethernet Expansion Card (CFFh) for IBM BladeCenter

To install a CFFh expansion card, complete the following steps:

1. Locate the blade server expansion connector (see "Blade server connectors" on page 14).
2. If a cover is installed on the blade expansion connector, remove it by using your fingers to lift the cover from the blade expansion connector.
3. 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.

4. 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 server expansion connector.
5. Firmly press on the indicated locations to seat the expansion card.

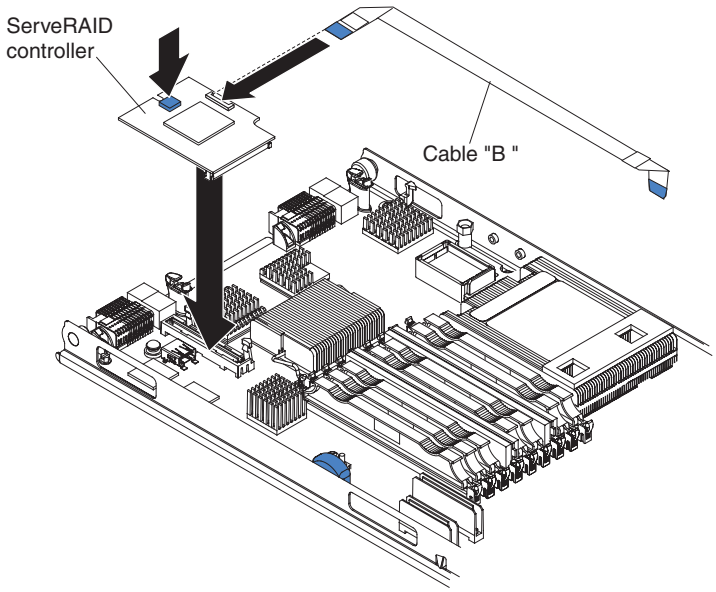
   Note: For device-driver and configuration information to complete the installation of the expansion card, see the documentation that comes with the expansion card.
6. Install the cover onto the blade server (see "Closing the blade server cover" on page 56).
7. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 53).

Installing a storage interface card

Use this information to install a storage interface card in the blade server.

The storage interface card controls the SAS storage drives. The following illustrations and installation instructions show how to install a ServeRAID-MR10ie controller into the CIOv expansion connector of the blade server. The illustrations and installation instructions are similar for other CIOv storage interface cards.

Note: The backup-battery will be installed in DIMM connector ten and might affect how much memory is recognized by the blade server. Review the tables in "Installing a memory module" on page 64 to make sure that your memory configuration will not be affected.

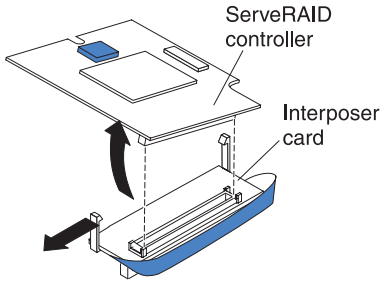


Attention: Before you install a ServeRAID-MR10ie controller in the blade server, make sure the PCIe speed is set to Gen1. You can configure the PCIe speed in the Setup utility by selecting **System Settings** and **Devices and I/O Ports**.

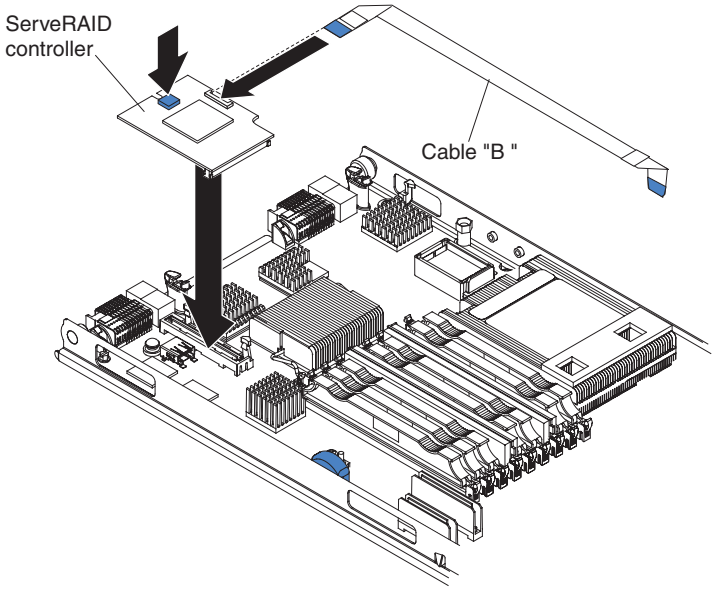
To install a storage interface card, complete the following steps.

1. Locate the CIOv expansion connector (see "Blade server connectors" on page 14).

2. Touch the static-protective package that contains the storage interface card to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the storage interface card from the package.
3. If an interposer card is installed on the storage interface card, remove it.



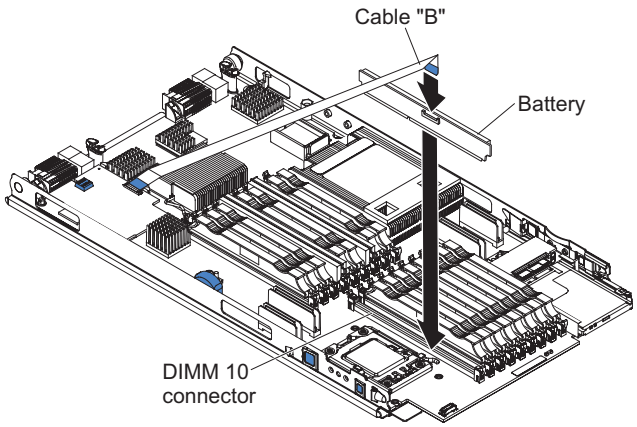
   a. If the interposer has a pull strap, move the pull strap away from the storage interface card. If the pull strap surrounds the storage interface card, the pull strap will interfere with the removal of the interposer card.
   b. Press out on the plastic latch that holds the interposer card to the storage interface card and simultaneously lift up on the controller, as shown.
   c. Separate the interposer card from the storage interface card and store the interposer card in a safe place.
4. Install the backup-battery cable to the storage interface card.
   a. If you are installing a ServeRAID-MR10ie controller, select cable "B" from the packaging.
   b. Locate the end of the cable marked “EXPANSION CARD”; then, with the blue side of the cable end facing up, carefully insert the cable end into the cable connector on the ServeRAID controller.



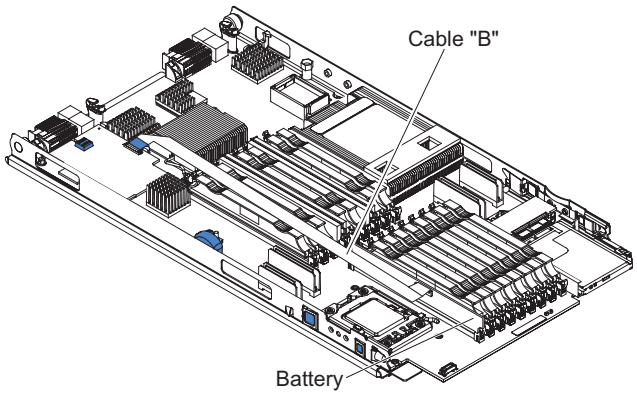
5. Orient the connector on the storage interface card with the CIOv expansion connector on the system board; then, press the storage interface card into the CIOv expansion connector.
6. Firmly press on the indicated locations to seat the storage interface card.

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

7. Install the backup battery for the storage interface card into DIMM connector ten (see "Blade server connectors" on page 14 and "Installing a memory module" on page 64).



8. Install the backup-battery cable to the backup battery. The side of the cable with the blue touchpoint should be oriented towards the center of the blade server.
9. Orient the backup-battery cable so that it lays flat over the top of the heat sink for microprocessor two.



10. If you removed an optional expansion unit, reinstall it (see "Installing an optional expansion unit" on page 58).
11. Install the cover onto the blade server (see "Closing the blade server cover" on page 56).
12. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 53).

Removing and replacing Tier 2 customer replaceable units (CRUs)

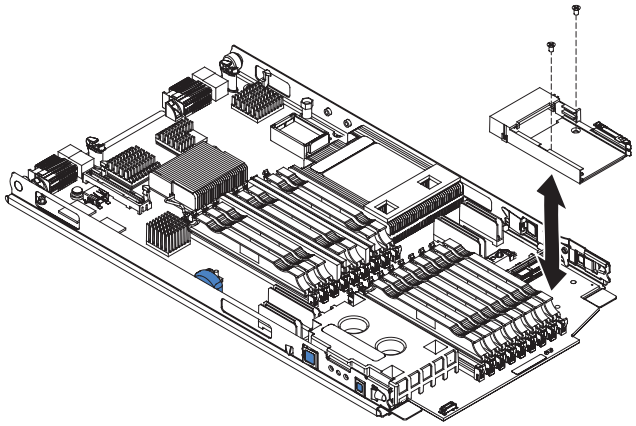
Use this information for removing and replacing Tier 2 CRUs.

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.

Removing an SSD storage tray

Use this information to remove an SSD storage tray.

The blade server has an SSD drive tray which contains two SSD storage bays for installing SSD storage drives. To remove an SSD storage tray, complete the following steps.



1. Before you begin, read "Safety" on page v and "Installation guidelines" on page 49.
2. Remove the blade server from the BladeCenter unit (see "Removing the blade server from the BladeCenter unit" on page 52).
3. Remove the cover from the blade server (see "Removing the blade server cover" on page 55).
4. If an expansion unit is installed, remove the expansion unit (see "Removing an optional expansion unit" on page 57).
5. Remove the front bezel from the blade server (see "Removing the bezel assembly" on page 59).
6. Locate the SSD storage tray (see "Blade server connectors" on page 14).
7. Remove any SSD storage drives from the SSD storage tray (see "Removing a SSD storage drive" on page 61).

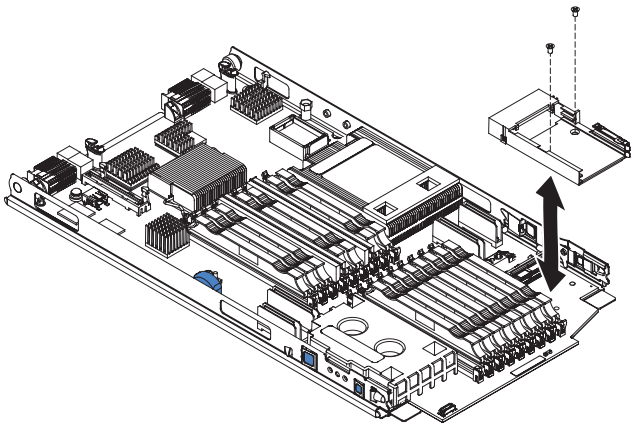
   Attention: When you remove an SSD drive, use a felt-tip pen to write which SSD connector the drive was removed from on the drive label. Installing an SSD drive into a different SSD connector can damage the RAID configuration.
8. Using a screwdriver, remove the two screws that secure the SSD storage tray to the blade server.
9. Use your fingers to lift the SSD storage tray from the blade server.
10. If you are instructed to return the storage drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing an SSD storage tray

Use these instructions to install an SSD storage tray in the blade server.

The blade server has an SSD drive tray which contains two SSD storage bays for installing SSD storage drives.

To install an SSD storage tray, complete the following steps.



1. Identify the location on the blade server where the SSD drive tray will be installed (see “Blade server connectors” on page 14).
2. Touch the static-protective package that contains the drive tray 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.
3. Orient the SSD drive tray so that the release latches are towards the front of the blade server.
4. Align the screw holes in the drive tray with the screw holes on the blade server.
5. Use a screwdriver to install two screws into the SSD drive tray and tighten the screws until the SSD drive tray is secure.

   Note: Make sure the SSD drives are installed into the same SSD connector that they were removed from to maintain any RAID array that might be configured.
6. Install any SSD storage drives that were removed from your blade server (see “Installing a SSD storage drive” on page 62).
7. Install the front bezel onto the blade server (see “Installing the bezel assembly” on page 60).
8. If an expansion was installed, install the expansion unit (see “Installing an optional expansion unit” on page 58).
9. Install the cover onto the blade server (see “Closing the blade server cover” on page 56).
10. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 53).

Removing and replacing field replaceable units

Use this information to remove and replace field replaceable units (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

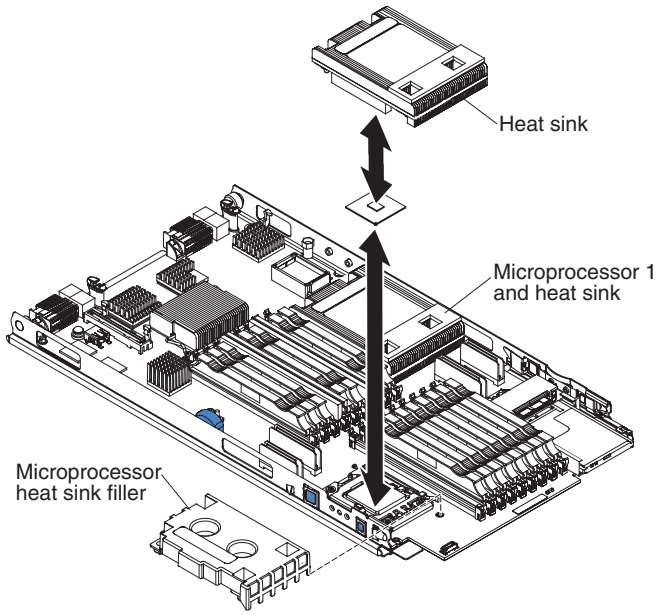
Use this information to remove a microprocessor and heat sink from the blade server.

Read the following important guidelines before you remove 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 carefully handle the heat sink and microprocessor when you remove or install these components. Do not touch the thermal material or otherwise allow it to become contaminated.

Note: The microprocessor and heat sink assembly are both field-replaceable units (FRUs) and must be replaced by a trained service technician. To contact an IBM service representative, see "Hardware service and support" on page 227.

To remove a microprocessor, complete the following steps.

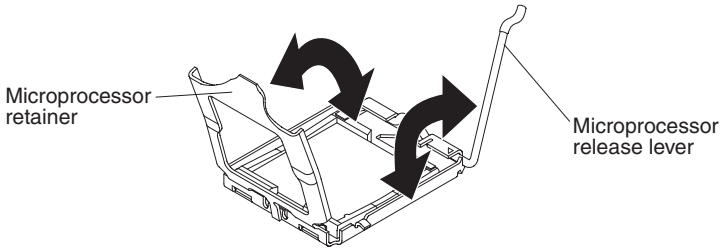


1. Before you begin, read "Safety" on page v and "Installation guidelines" on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from the BladeCenter unit" on page 52 for instructions).
3. Remove the blade server cover (see "Removing the blade server cover" on page 55 for instructions).

4. If an optional expansion unit is installed, remove the expansion unit (see "Removing an optional expansion unit" on page 57).
5. Locate the microprocessor that will be removed (see "Blade server connectors" on page 14).
6. If you are removing microprocessor 2, remove the bezel (see "Removing the bezel assembly" on page 59).
7. Before removing the microprocessor, you must remove the memory module closest to the microprocessor.
   a. If you are removing microprocessor 1, remove the memory module from DIMM connector 1 (see "Removing a memory module" on page 63).
   b. If you are removing microprocessor 2, remove the memory module from DIMM connector 10 (see "Removing a memory module" on page 63).
8. Remove the heat sink.

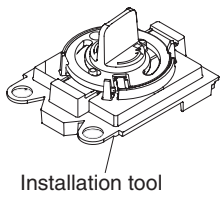
   Attention: Do not touch the thermal material on the bottom of the heat sink. Touching the thermal material will contaminate it. If the thermal material on the microprocessor or heat sink becomes contaminated, you must replace the heat sink.
   a. Loosen the screw on one side of the heat sink to break the seal with the microprocessor.
   b. Use a screwdriver to loosen the screws on the heat sink, rotating each screw two full turns until each screw is loose.
   c. Use your fingers to gently pull the heat sink from the microprocessor.

   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.

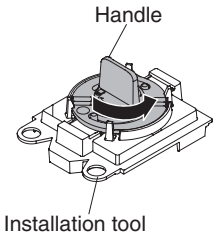


9. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops in the fully open position (approximately a 135° angle). Lift the microprocessor retainer cover upward.

   Attention: Do not touch the microprocessor contacts; handle the microprocessor by the edges only. Contaminants on the microprocessor contacts, such as oil from your skin, can cause connection failures between the contacts and the socket.
10. Find the microprocessor installation tool that came with the new microprocessor.

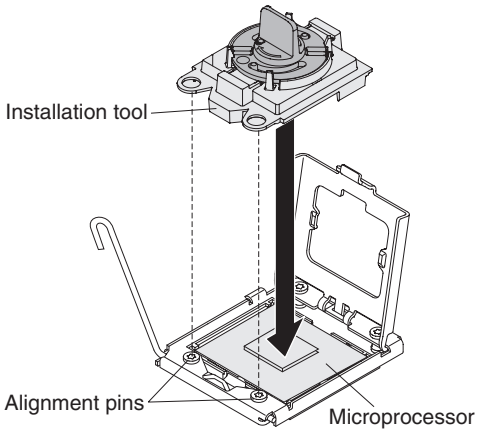


11. Twist the handle on the microprocessor tool counterclockwise so that it is in the open position.



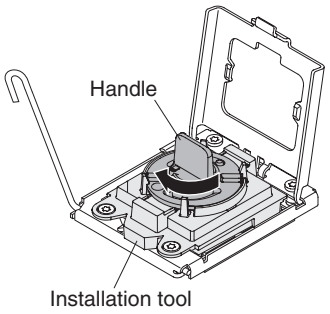
12. Place the microprocessor installation tool down over the microprocessor, aligning the holes on the tool with the screws on the microprocessor bracket.

    Note: The alignment holes on the tool will not sit flush on the microprocessor bracket screws. However, the holes can be used as a guide to ensure the proper alignment between the microprocessor installation tool and the microprocessor bracket.



13. Twist the handle clockwise to attach the tool to the microprocessor.

    Note: You can pick up or release the microprocessor by twisting the microprocessor installation tool handle.

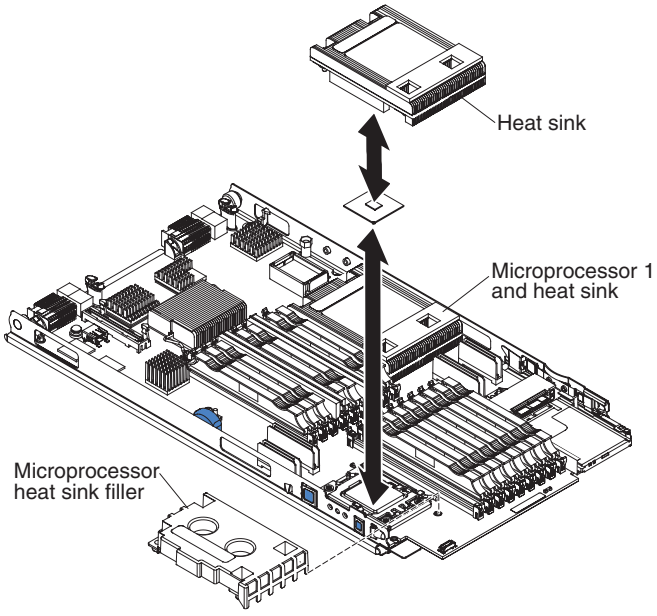


14. Carefully lift the microprocessor straight up and out of the socket, and place it on a static-protective surface.
15. If you are instructed to return the microprocessor and heat sink, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a microprocessor and heat sink

Use this information to install a microprocessor and heat sink in the blade server.

The following illustration shows how to install a microprocessor and heat sink in the blade server.

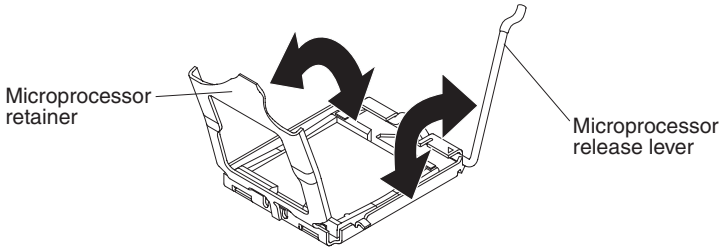


Attention:

1. 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.
2. Do not touch the contacts in the microprocessor socket. Touching these contacts might result in permanent damage to the system board.

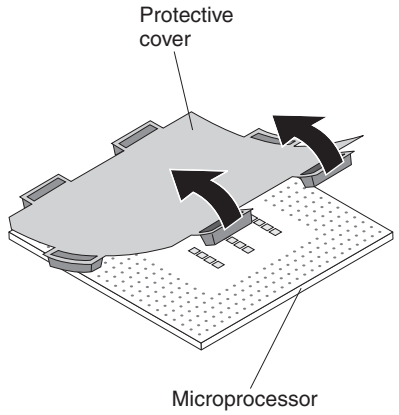
To install a microprocessor and heat sink, complete the following steps.

1. If you are not installing a new microprocessor and a new heat sink, remove the thermal grease from the heat sink and microprocessor; then, apply new thermal grease before installation (see "Thermal grease" on page 92).
2. Open the microprocessor socket release lever and retainer.

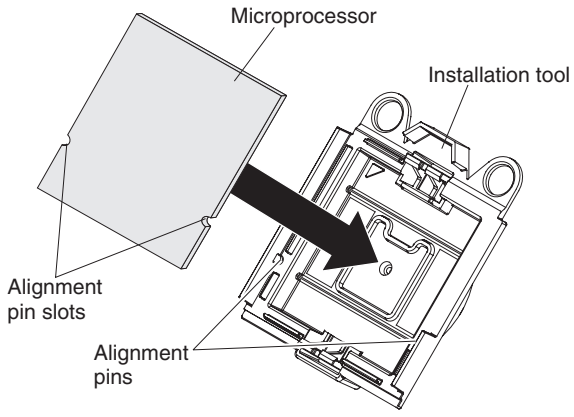


   a. Rotate the release lever on the microprocessor socket from its closed and locked position until it stops in the fully open position (approximately a 135° angle).
   b. Rotate the microprocessor retainer on the microprocessor socket from its closed position until it stops in the fully open position (approximately a 135° angle).

3. If a dust cover is installed over the microprocessor socket, lift the dust cover from the socket and store it in a safe place.
4. Install the microprocessor in the microprocessor installation tool.
   a. Remove the static-protective bag and the foam surrounding the bag from the box.
   b. Touch the static-protective bag that contains the new microprocessor to any *unpainted* surface on the BladeCenter chassis or any *unpainted* metal surface on any other grounded rack component.
   c. Carefully remove the microprocessor from the static-protective bag, touching only the edges of the microprocessor.
   d. If there is a plastic protective cover on the bottom of the microprocessor, carefully remove it.

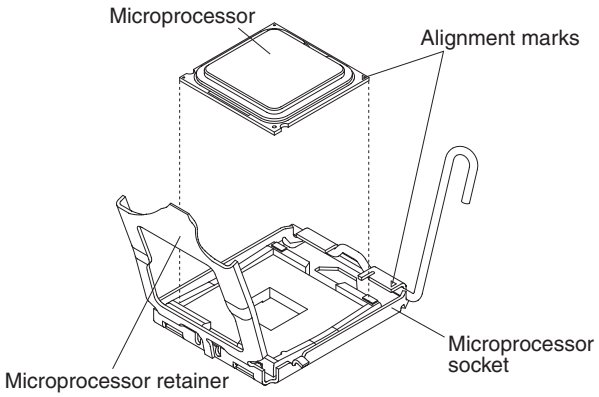


   e. Twist the handle of the installation tool counterclockwise so that it is in the open position.
   f. Align the microprocessor alignment slots with the alignment pins on the microprocessor installation tool and place the microprocessor on the underside of the tool so that the tool can grasp the microprocessor correctly.

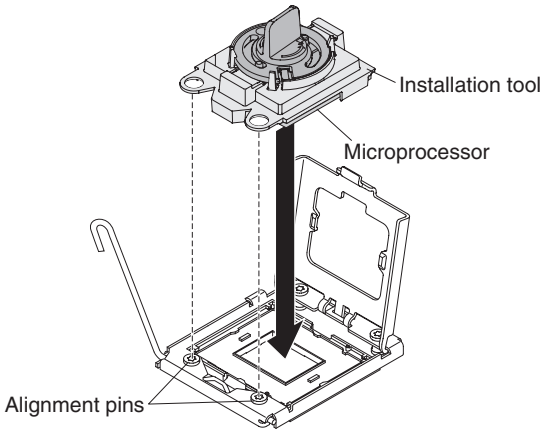


   g. Twist the handle of the installation tool clockwise to secure the microprocessor in the tool.

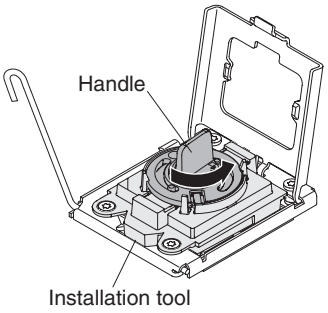
      Note: You can pick up or release the microprocessor by twisting the microprocessor installation tool handle.
5. Install the microprocessor.
   a. Remove the dust cover from the bottom of the microprocessor.



b. Align the installation tool with the microprocessor socket as shown in the following illustration.



c. Twist the handle on the microprocessor tool counterclockwise to insert the microprocessor into the socket.



Attention:

- Do not press the microprocessor into the socket.
- Do not touch exposed pins of the microprocessor socket.
- Make sure that the microprocessor is oriented and aligned correctly in the socket before you try to close the microprocessor retainer.
- Do not touch the thermal material on the bottom of the heat sink or on top of the microprocessor. Touching the thermal material will contaminate it. If the thermal material on the microprocessor or heat sink becomes contaminated, contact your service technician.

6. Carefully close the microprocessor retainer.

7. 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 pressing the tab on the microprocessor socket.
8. If you are reinstalling a heat sink that were removed from the blade server, complete the following steps:

   Attention:

   a. Thermal grease must be removed using an alcohol wipe from the microprocessor and heat sink if either component has been replaced. New thermal grease muse then be applied to the heat sink before it is installed (see "Thermal grease" on page 92).
   b. 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. Make sure that the microprocessor and the heat sink were the same pair that were removed from the blade server. If they are not, the old thermal grease must be removed using an alcohol wipe and new thermal grease must be applied to the heat sink (see "Thermal grease" on page 92).
   b. Make sure that the thermal material is still on the bottom of the heat sink and on the top of the microprocessor.
   c. 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.
   d. Align the three screws on the heat sink with the holes on the heat-sink retention module.
   e. Press firmly on the captive screws and tighten them with a screwdriver, alternating among the 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 Newton-meters (Nm) to 13 Nm (6.3 foot-pounds to 9.6 foot-pounds).
9. If you are installing a new heat sink, complete the following steps:

   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. Apply thermal grease to the heat sink (see "Thermal grease" on page 92).
   c. 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.
   d. Align the three screws on the heat sink with the holes on the heat-sink retention module.
   e. Press firmly on the captive screws and tighten them with a screwdriver, alternating among the 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 Newton-meters (Nm) to 13 Nm (6.3 foot-pounds to 9.6 foot-pounds).
10. Reinstall the memory module closest to the microprocessor you installed.

a. If you installed microprocessor 1, install the memory module into DIMM connector 1 (see “Installing a memory module” on page 64).
b. If you installed microprocessor 2, install the memory module into DIMM connector 10 (see “Installing a memory module” on page 64).

11. If you are using a single microprocessor, make sure that a memory module is installed in DIMM socket 3. If two microprocessors are installed in the blade server, make sure that memory modules are installed in DIMM socket 3 and DIMM socket 12. See “Installing a memory module” on page 64 for more information on installing a memory module.
12. If you removed the bezel in a previous step, install the bezel (see “Installing the bezel assembly” on page 60).
13. Install the optional expansion unit, if you removed one from the blade server to replace the battery (see “Installing an optional expansion unit” on page 58 for instructions).
14. Install the cover onto the blade server (see “Closing the blade server cover” on page 56).
15. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 53).

Thermal grease

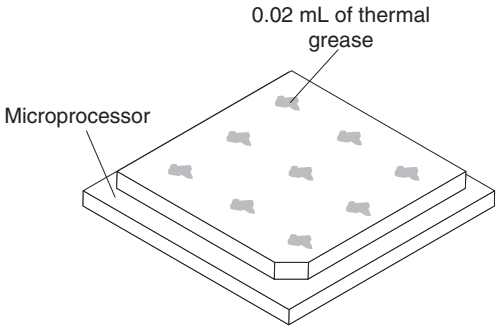
Use this information to determine the guidelines for using thermal grease on a heat sink and processor.

The thermal grease must be replaced whenever the heat sink has been removed from the top of the microprocessor and is going to be reused or when debris is found in the grease.

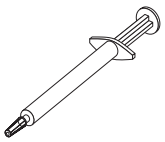
To replace missing, damaged, or contaminated thermal grease on the microprocessor and heat sink, complete the following steps:

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

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



5. Use the thermal-grease syringe to place nine uniformly spaced dots of 0.02 mL each on the top of the microprocessor.



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

6. Continue with step 5 on page 89.

Removing the system-board assembly

Use this information to remove the system-board assembly from the blade server.

Attention: The system-board assembly is a field-replaceable unit (FRU) and must be replaced by a trained service technician. To contact an IBM service representative, see "Hardware service and support" on page 227.

When you replace 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 14 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. Before you begin, read "Safety" on page v and "Installation guidelines" on page 49.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from the BladeCenter unit" on page 52 for instructions).
3. Carefully lay the blade server on a flat, static-protective surface.
4. Remove the blade server cover (see "Removing the blade server cover" on page 55).
5. If an optional expansion unit is installed, remove the expansion unit (see "Removing an optional expansion unit" on page 57).
6. Remove all of the installed components in the following list from the system-board assembly; then, place them on a static-protective surface or immediately install them on the new system-board assembly.
   - DIMMs. See "Removing a memory module" on page 63.
   - I/O expansion cards. See "Removing a CIOv-form-factor expansion card" on page 74, "Removing a horizontal-combination-form-factor expansion card" on page 75, and "Removing a storage interface card" on page 76.
   - USB module. See "Removing a USB Flash key" on page 70.
   - Storage drives. See "Removing a SSD storage drive" on page 61.
   - Microprocessors and heat sinks. See "Removing a microprocessor and heat sink" on page 85.
7. Remove the dust cover over the microprocessor sockets of the new system-board assembly and place them over the microprocessor sockets of the old system-board assembly (see "System-board layouts" on page 14).
8. 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

Use this information to install the system-board assembly in the blade server.

Attention: The system-board assembly is a field-replaceable unit and must be replaced by a trained service technician. To contact an IBM service representative, see "Hardware service and support" on page 227.

Important: When you replace the system board, you must either update the server with the latest firmware or restore the pre-existing firmware that the customer provides on a diskette or CD image. Make sure that you have the latest firmware or a copy of the pre-existing firmware before you proceed. See "Updating the DMI/SMBIOS data" on page 26 and "Firmware updates" on page 33 for more information.

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

1. Install all of the components in the following list that you removed from the old system-board assembly onto the new system-board assembly.
   - USB module. See "Installing a USB Flash key" on page 71.
   - I/O expansion cards. See "Installing a CIOv-form-factor expansion card" on page 78, "Installing a horizontal-combination-form-factor expansion card" on page 79, and"Installing a storage interface card" on page 80.
   - Storage drives. See "Installing a SSD storage drive" on page 62.
   - Microprocessors and heat sinks. See "Installing a microprocessor and heat sink" on page 88.
   - DIMMs. See "Installing a memory module" on page 64.
2. Install the optional expansion unit, if you removed one from the blade server to replace the battery (see "Installing an optional expansion unit" on page 58 for instructions).
3. Install the cover onto the blade server (see "Closing the blade server cover" on page 56).
4. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 53).
5. The Universal Unique Identifier (UUID) must be updated when the system board is replaced. Use the Advanced Settings Utility to update the UUID in the UEFI-based server (see "Updating the Universal Unique Identifier (UUID)" on page 23).
6. Update the server with the latest firmware or restore the pre-existing firmware that the customer provides on a diskette or CD image. Make sure that you have the latest firmware or a copy of the pre-existing firmware before you proceed. See "Updating the DMI/SMBIOS data" on page 26 and "Firmware updates" on page 33 for more information.

Chapter 6. Diagnostics

Use this information to review the diagnostic tools that are available to help you solve problems that might occur in the blade server.

Review 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 217 for information about isolating problems with these resources).

If you cannot locate and correct a problem by using the information in this chapter, see "Getting help and technical assistance," on page 225 for more information.

Diagnostic tools overview

Use this overview to locate specific diagnostic tools to diagnose and solve hardware-related problems.

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

- **Troubleshooting tables**

  These tables list problem symptoms and actions to correct the problems. See "Troubleshooting tables" on page 164
- **Light path diagnostics**

  Use light path diagnostics LEDs on the system board to diagnose system errors. If the system-error LED on the system LED panel on the front or rear of the BladeCenter unit is lit, one or more error LEDs on the BladeCenter unit components also might be lit. These LEDs help identify the cause of the problem. For more information about the blade server error LEDs, see "Light path diagnostics LEDs" on page 183.
- **Dynamic System Analysis (DSA) Portable Edition diagnostic program**

  DSA tests the major components of the BladeCenter unit, including the management modules, I/O modules, removable-media drives, and the blade servers, while the operating system is running. For documentation and download information for DSA, see http://www.ibm.com/systems/management/. For more information about diagnostic programs and error messages, see "Dynamic system analysis diagnostic programs and messages" on page 185

  Note: If you are unable to find the system-error logs in the blade server firmware code, view the system-event log in the BladeCenter management module.
- **Dynamic System Analysis (DSA) Preboot diagnostic program**

  The DSA Preboot diagnostic programs are stored in read-only memory and collect and analyze system information to aid in diagnosing server problems. The diagnostic programs collect the following information about the server:

  – Drive health information

- Event logs for ServeRAID controllers and service processors
- Hardware inventory, including PCI and USB information
- Light path diagnostics status
- LSI RAID and controller configuration
- Network interfaces and settings
- ServeRAID configuration
- Service processor status and configuration
- System configuration
- Vital product data, firmware, and Unified Extensible Firmware Interface (UEFI) configuration

The diagnostic programs create a merged log that includes events from all collected logs. The information is collected into a file that you can send to IBM service and support. Additionally, you can view the information locally through a generated text report file. You can also copy the log to removable media and view the log from a Web browser.

POST

Use this information for more about POST self-test errors for the blade server.

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 you are prompted, for POST to run.

If POST is completed without detecting any problems, the server startup will continue.

If POST detects a problem, an error message is displayed. See "POST error codes" on page 144 for more information.

When new hardware is installed or the firmware for an expansion card has been updated, the blade server could fail during POST. If this occurs after three attempts to boot the blade server, the blade server will use the default configuration values; then, start the Setup utility (see "Using the Setup utility" on page 20). To allow the blade server to boot normally, complete the following steps:

1. If any configuration changes were made before the blade server became unable to boot, change the settings back to their original values.
2. If new hardware was added before the blade server became unable to boot, remove the new hardware and restart the server.
3. If the previous steps do not correct the problem and the blade server starts the Setup utility (see "Using the Setup utility" on page 20), select **Load Default Settings** and save the settings to restore the blade server to the default values.

Error logs

Error codes and messages are displayed in the following types of event logs:

- **POST event log:** This log contains the three most recent error codes and messages that were generated during POST. You can view the POST event log through the Setup utility.
- **System-event log:** This log contains POST and system management interrupt (SMI) events and all events that are generated by the BMC that is embedded in the IMM. You can view the system-event log through the Setup utility and through the Dynamic System Analysis (DSA) program (as the IPMI event log).

  The system-event log is limited in size. When it is full, new entries will not overwrite existing entries; therefore, you must periodically save and then clear the system-event log through the Setup utility. When you are troubleshooting, you might have to save and then clear the system-event log to make the most recent events available for analysis.

  Messages are listed on the left side of the screen, and details about the selected message are displayed on the right side of the screen. To move from one entry to the next, use the Up Arrow (↑) and Down Arrow (↓) keys.

  Some IMM sensors cause assertion events to be logged when their setpoints are reached. When a setpoint condition no longer exists, a corresponding deassertion event is logged. However, not all events are assertion-type events.
- **Integrated management module (IMM) event log:** This log contains a filtered subset of all IMM, POST, and system management interrupt (SMI) events. You can view the IMM event log through the Dynamic System Analysis (DSA) program (as the ASM event log).
- **Advanced management module event log:** This log contains a filtered subset of IMM, POST, and system management interrupt (SMI) events. You can view the advanced management module event log through the advanced management module Web interface.
- **DSA log:** This log is generated by the Dynamic System Analysis (DSA) program, and it is a chronologically ordered merge of the system-event log (as the IPMI event log), the IMM chassis-event log (as the ASM event log), and the operating-system event logs. You can view the DSA log through the DSA program.

Viewing event logs through the Setup utility

Use this information to view the IMM log through the Setup utility.

For complete information about using the Setup utility, see "Using the Setup utility" on page 20.

To view the POST event log or system-event log, complete the following steps:

1. Turn on the blade server.
2. When the prompt `<F1> Setup` is displayed, press F1. If you have set both a power-on password and an administrator password, you must type the administrator password to view the event logs.
3. Select **System Event Logs** and use one of the following procedures:
   - To view the POST event log, select **POST Event Viewer**.
   - To view the system-event log, select **System Event Log**.

Viewing event logs without restarting the blade server

If the blade server is not hung, methods are available for you to view one or more event logs without having to restart the blade server.

You can view the advanced management module event log through the **Event Log** link in the advanced management module Web interface. For more information, see the *Advanced Management Module User's Guide* and *Advanced Management Module Command-Line Interface Reference Guide*.

If you have installed Portable Dynamic System Analysis (DSA), you can use it to view the system-event log (as the IPMI event log), the advanced management module event log (as the ASM event log), the operating-system event logs, or the merged DSA log. You can also use DSA Preboot to view these logs, although you must restart the blade server to use DSA Preboot. To install Portable DSA, DSA Preboot or to download a DSA Preboot CD image, go to http://www.ibm.com/systems/support/supportsite.wss/docdisplay?lndocid=SERV-DSA&brandind=5000008 or 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. Under **Related downloads**, click **Dynamic System Analysis (DSA)** to display the matrix of downloadable DSA files.

If IPMItool is installed in the blade server, you can use it to view the system-event log. Most recent versions of the Linux operating system come with a current version of IPMItool. For information about IPMItool, see http://publib.boulder.ibm.com/infocenter/lnxinfo/v3r0m0/index.jsp?topic=/liaai/ipmi/liaaiipmiother.htm or 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 "Viewing event logs through the Setup utility" on page 99.
2. Click **Linux information**.
3. Expand **Blueprints for Linux on IBM systems**, and click **Using Intelligent Platform Management Interface (IPMI) on IBM Linux platforms**.

The following table describes the methods that you can use to view the event logs, depending on the condition of the blade server. The first two conditions generally do not require that you restart the blade server.

Table 9. Methods for viewing event logs

Condition	Action
The blade server is not hung.	Use any of the following methods: • In a Web browser, type the IP address of the advanced management module and go to the Event Log page. • Run Portable DSA to view the event logs or create an output file that you can send to IBM service and support. • Use IPMItool to view the system-event log.
The blade server is hung.	• If DSA Preboot is installed, restart the blade server and press F2 to start DSA Preboot and view the event logs. • If DSA Preboot is not installed, insert the DSA Preboot CD and restart the blade server to start DSA Preboot and view the event logs. • Alternatively, you can restart the blade server and press F1 to start the Setup utility and view the POST event log or system-event log. For more information, see "Viewing event logs through the Setup utility" on page 99.

IMM error messages

Use this information to resolve IMM error messages.

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

Note: An updated list of IMM error messages and corrective actions are available on the IBM website at http://www.ibm.com/systems/support/supportsite.wss/docdisplay?lndocid=MIGR-5079338&brandind=5000008.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x80010200	Error	Expansion Module 1 (BPE3 12V Sense) voltage under critical threshold. Reading: *X*, Threshold: *Y*	1. If the under voltage problem is occurring on all blade servers, look for other events in the IMM event log related to power and resolve those events (see "Error logs" on page 99). 2. View the event log provided by the advanced management module for your BladeCenter unit and resolve any power related errors that might be displayed. 3. If other modules or blades are logging the same issue then check the system power supply, otherwise replace the Blade PCI Express I/O expansion unit. See "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58.
0x80010200	Error	Expansion Module 1 (BPE3 12VSB Sense) voltage under critical threshold. Reading: *X*, Threshold: *Y*	1. If the under voltage problem is occurring on all blade servers, look for other events in the log related to power and resolve those events (see "Error logs" on page 99). 2. View the event log provided by the advanced management module for your BladeCenter unit and resolve any power related errors that might be displayed. 3. If other modules or blades are logging the same issue; then, check the power supply for the BladeCenter unit. 4. If the base blade is not logging a power issue; then, replace the Blade PCI Express I/O expansion unit. See "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58.
0x80010200	Error	Expansion Module 1 (BPE3 3.3V Sense) voltage under critical threshold. Reading: *X*, Threshold: *Y*	1. If the under voltage problem is occurring on all blade servers, look for other events in the log related to power and resolve those events (see "Error logs" on page 99). 2. View the event log provided by the advanced management module for your BladeCenter unit and resolve any power related errors that might be displayed. 3. If the base blade is not logging a power issue; then, replace the Blade PCI Express I/O expansion unit. See "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x80010200	Error	System board (Planar 12V) voltage under critical threshold. with chassis Reading: *X*, Threshold: *Y*	1. If the under voltage problem is occurring on all blade servers, look for other events in the log related to power and resolve those events (see "Error logs" on page 99). 2. View the event log provided by the advanced management module for your BladeCenter unit and resolve any power related errors that might be displayed. 3. If other modules or blades are logging the same issue then check the power supply for the BladeCenter unit. 4. If the error still occurs, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x80010200	Error	System board (Planar 3.3V) voltage under critical threshold. Reading: *X*, Threshold: *Y*	1. Remove all expansion cards from the blade server (see "Removing an I/O expansion card" on page 74). 2. Remove all storage drives from the blade server (see "Removing a SSD storage drive" on page 61). 3. If the error still occurs, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x80010200	Error	System board (Planar 5V) voltage under critical threshold. with chassis Reading: *X*, Threshold: *Y*	1. Remove all expansion cards from the blade server (see "Removing an I/O expansion card" on page 74). 2. Remove all storage drives from the blade server (see "Removing a SSD storage drive" on page 61). 3. If the error still occurs, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x80010201	Error	CMOS Battery (CMOS Battery) voltage under critical threshold. with chassis Reading: *X*, Threshold: *Y*	Replace the system battery (see "Removing the battery" on page 71 and "Installing the battery" on page 72). **Note:** After you replace the system battery, verify that the blade server is running IMM firmware version 1.10 or newer to optimize the performance of the new system battery.

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- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are CRUs and which components are FRUs.**
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Error Code	Type	Error Message	Action
0x80010700	Warning	System board (Inlet Temp) temperature over/under warning threshold. Reading: *X*, Threshold: *Y*	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running.
0x80010900	Error	Expansion Module 1 (BPE3 12V Sense) voltage under critical threshold. with chassis Reading: *X*, Threshold: *Y*	1. If the under voltage problem is occurring on all blade servers, look for other events in the log related to power and resolve those events (see "Error logs" on page 99). 2. View the event log provided by the advanced management module for your BladeCenter unit and resolve any power related errors that might be displayed. 3. If other modules or blades are logging the same issue then check the power supply for the BladeCenter unit. 4. If the error continues, replace the Blade PCI Express I/O expansion unit. See "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58.
0x80010900	Error	Expansion Module 1 (BPE3 12VSB Sense) voltage over critical threshold. Reading: *X*, Threshold: *Y*	1. If the over voltage problem is occurring on all blade servers, look for other events in the log related to power and resolve those events. 2. View the event log provided by the advanced management module for your BladeCenter unit and resolve any power related errors that might be displayed. 3. If other modules or blades are logging the same issue then check the power supply for the BladeCenter unit. 4. If the error continues, replace the Blade PCI Express I/O expansion unit. See "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x80010900	Error	Expansion Module 1 (BPE3 3.3V Sense) voltage under critical threshold. with chassis Reading: *X*, Threshold: *Y*	1. If the under voltage problem is occurring on all blade servers, look for other events in the log related to power and resolve those events. 2. View the event log provided by the advanced management module for your BladeCenter unit and resolve any power related errors that might be displayed. 3. If other modules or blades are logging the same issue then check the power supply for the BladeCenter unit. 4. If the error continues, replace the Blade PCI Express I/O expansion unit. See "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58.
0x80010900	Error	System board (Planar 12V) voltage over critical threshold. Reading: *X*, Threshold: *Y*	1. If the over voltage problem is occurring on all blade servers, look for other events in the log related to power and resolve those events. 2. View the event log provided by the advanced management module for your BladeCenter unit and resolve any power related errors that might be displayed. 3. If other modules or blades are logging the same issue then check the power supply for the BladeCenter unit. 4. If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x80010900	Error	System board (Planar 3.3V) voltage over critical threshold. Reading: *X*, Threshold: *Y*	Replace the blade (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x80010900	Error	System board (Planar 5V) voltage over critical threshold. Reading: *X*, Threshold: *Y*	1. Remove all expansion cards from the blade server (see "Removing an I/O expansion card" on page 74). 2. Remove all storage drives from the blade server (see "Removing a SSD storage drive" on page 61). 3. If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x80010900	Error	System board (Inlet Temp) temperature over/under critical threshold with chassis reading: *X*, Threshold: *Y*	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running.
0x80010B00	Error	System board (Inlet Temp) temperature over/under non-recoverable threshold. Reading: X, Threshold: Y	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running.
0x80070100	Warning	Memory device *X*, temperature (DIMM *X* Temp) warning [Note: *X*=1-18]	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running.
0x80070100	Warning	Processor *X*, temperature (CPU *X* OverTemp) warning [Note: *X*=1-2]	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running.
0x80070200	Error	Memory device *X*, temperature (DIMM *X* Temp) critical [Note: *X*=1-18]	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running.

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Error Code	Type	Error Message	Action
0x80070200	Error	Processor *X*, temperature (CPU *X* OverTemp) critical [Note: *X*=1-2]	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running. 4. Make sure that the CPU heat sink is properly attached to the CPU (see "Installing a microprocessor and heat sink" on page 88).
0x80070200	Error	System board, voltage (Planar Fault) critical	1. Reseat the blade server in the BladeCenter unit (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 2. If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x80070200	Error	Expansion Card 1 (LDC Fault) critical	1. Check the operating system event log and the system event log as it may contain additional information (see "Error logs" on page 99). 2. Reseat the blade server in the BladeCenter (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 3. Update the device drivers for any expansion cards that are installed into the blade server. 4. Reseat the expansion card (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 5. Replace the expansion card (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78).

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- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are CRUs and which components are FRUs.**
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Error Code	Type	Error Message	Action
0x80070200	Error	PCI express bus 1, Expansion Card (HSDC Fault) critical	1. Check the operating system event log and the system event log as it may contain additional information (see "Error logs" on page 99). 2. Reseat the blade server in the BladeCenter (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 3. Update the device drivers for any expansion cards that are installed into the blade server. 4. Reseat the expansion card (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 5. Replace the expansion card (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78).
0x80070200	Error	System board, chip set (Sys Board Fault) critical	1. Make sure that the latest firmware is being used (see "Firmware updates" on page 33). 2. Reseat the blade server in the BladeCenter (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 3. Reset the UEFI firmware settings to default values using the Setup utility (see "Using the Setup utility" on page 20). 4. (Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x80070300	Error	Processor *X*, temperature (CPU *X* OverTemp) non-recoverable [Note: *X*=1-2]	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running. 4. Make sure that each bay of the BladeCenter unit has either a device or a filler installed. 5. Make sure that the blade server is not missing any heat sinks, DIMMs, heat-sink fillers, or DIMM fillers (see Chapter 4, "Parts listing, Types 7871 and 1949," on page 41). 6. Make sure that the CPU heat sink is properly attached to the CPU (see "Installing a microprocessor and heat sink" on page 88).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are CRUs and which components are FRUs.**
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Error Code	Type	Error Message	Action
0x80070600	Error	Processor *X*, temperature (CPU *X* OverTemp) non-recoverable [Note: *X*=1-2]	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running. 4. Make sure that each bay of the BladeCenter unit has either a device or a filler installed. 5. Make sure that the blade server is not missing any heat sinks, DIMMs, heat-sink fillers, or DIMM fillers (see Chapter 4, "Parts listing, Types 7871 and 1949," on page 41). 6. Make sure that the CPU heat sink is properly attached to the CPU (see "Installing a microprocessor and heat sink" on page 88).
0x80080000	Information	Blade bezel 1, presence (Front Panel) present	1. Reseat the control-panel cable (see "Removing the bezel assembly" on page 59 and "Installing the bezel assembly" on page 60) 2. Replace the front bezel (see "Removing the bezel assembly" on page 59 and "Installing the bezel assembly" on page 60). 3. (Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x80090000	Information	System board, memory (Performance Mode) disabled/enabled	This is informational only, no action is required. The performance mode has been enabled or disabled.

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Error Code	Type	Error Message	Action
0x800B0100	Error	Memory device 0 (Bckup Mem Status) is not redundant	1. Check the event logs for other memory errors that might occur (see "Error logs" on page 99). 2. Reseat all of the memory modules in the blade server (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 3. Make sure all of the memory is enabled in the Setup utility (see "Using the Setup utility" on page 20). Notice which memory modules are disabled before continuing to the next step. 4. If the error still occurs, replace the memory modules that were disabled in the Setup utility (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 5. (Trained service technician only) If the error still occurs, replace the microprocessor that controls the failing memory module. **Note:** DIMM sockets one through nine are controlled by the first microprocessor and DIMM sockets ten through eighteen are controlled by the second microprocessor. See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88.
0x800B0300	Warning	Memory device 0 (Bckup Mem Status) is not redundant and operational with minimal resources	1. Check the event logs for other memory errors that might occur (see "Error logs" on page 99). 2. Reseat all of the memory modules in the blade server (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 3. Make sure all of the memory is enabled in the Setup utility (see "Using the Setup utility" on page 20). Notice which memory modules are disabled before continuing to the next step. 4. If the error still occurs, replace the memory modules that were disabled in the Setup utility (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 5. (Trained service technician only) If the error still occurs, replace the microprocessor that controls the failing memory module. **Note:** DIMM sockets one through nine are controlled by the first microprocessor and DIMM sockets ten through eighteen are controlled by the second microprocessor. See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88.

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Error Code	Type	Error Message	Action
0x800B0500	Error	Memory device 0 (Bckup Mem Status) is not redundant and not operational	1. Check the event logs for other memory errors that might occur (see "Error logs" on page 99). 2. Reseat all of the memory modules in the blade server (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 3. Make sure all of the memory is enabled in the Setup utility (see "Using the Setup utility" on page 20). Notice which memory modules are disabled before continuing to the next step. 4. If the error still occurs, replace the memory modules that were disabled in the Setup utility (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 5. (Trained service technician only) If the error still occurs, replace the microprocessor that controls the failing memory module. **Note:** DIMM sockets one through nine are controlled by the first microprocessor and DIMM sockets ten through eighteen are controlled by the second microprocessor. See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88.
0x806F0007	Error	Group 4, processor (One of CPUs) internal error	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 3. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled. 4. If the problem continues, replace the processor (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 5. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0007	Error	Group 4, processor (All CPUs) internal error	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 3. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled. 4. If the problem continues, replace the processor (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 5. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x806F0007	Error	Group 4, processor (CPU *X* Status) internal error [Note *X*=1,2]	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 3. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled. 4. If the problem continues, replace the processor (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 5. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

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- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are CRUs and which components are FRUs.**
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Error Code	Type	Error Message	Action
0x806F000F	Error	FW/BIOS, firmware progress (ABR Status) FW/BIOS ROM corruption System board, firmware progress (Firmware Error) FW/BIOS ROM corruption	1. Install the latest UEFI firmware (see "Firmware updates" on page 33). 2. Follow the UEFI recovery procedure in "Recovering from a UEFI update failure" on page 212.
0x806F000F	Error	System board, firmware progress (Firmware Error) FW/BIOS ROM corruption	1. Install the latest UEFI firmware (see "Firmware updates" on page 33). 2. Follow the UEFI recovery procedure in "Recovering from a UEFI update failure" on page 212.
0x806F0013	Error	Chassis (NMI State) diagnostic interrupt	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 6. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 7. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

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Error Code	Type	Error Message	Action
0x806F0013	Error	Chassis (NMI State) bus timeout	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 6. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 7. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x806F0013	Error	Chassis (NMI State) software NMI	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Reseat any expansion cards that are installed in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 6. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 7. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 8. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are CRUs and which components are FRUs.**
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Error Code	Type	Error Message	Action
0x806F0021	Error	System board, connector (PCIe Status) fault	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Reseat any expansion cards that are installed in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 6. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 7. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 8. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x806F0107	Error	Group 4, processor (One of CPUs) thermal trip	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running. 4. Make sure that each bay of the BladeCenter unit has either a device or a filler installed. 5. Make sure that the blade server is not missing any heat sinks, DIMMs, heat-sink fillers, or DIMM fillers (see Chapter 4, "Parts listing, Types 7871 and 1949," on page 41). 6. Make sure that the CPU heat sink is properly attached to the CPU (see "Installing a microprocessor and heat sink" on page 88). 7. (Trained service technician only) If the error still occurs, replace the microprocessor. See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0107	Error	Group 4, processor (all CPUs) thermal trip	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running. 4. Make sure that each bay of the BladeCenter unit has either a device or a filler installed. 5. Make sure that the blade server is not missing any heat sinks, DIMMs, heat-sink fillers, or DIMM fillers (see Chapter 4, "Parts listing, Types 7871 and 1949," on page 41). 6. Make sure that the CPU heat sink is properly attached to the CPU (see "Installing a microprocessor and heat sink" on page 88). 7. (Trained service technician only) If the error still occurs, replace the microprocessor that controls the failing memory module. See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88.
0x806F0107	Error	Processor *X* (CPU *X* Status) thermal trip [Note: *X*=1-2]	1. Make sure that the room temperature is within the operating specifications (see "Features and specifications" on page 8). 2. Make sure that none of the air vents on the BladeCenter unit and on the blade server are blocked. 3. Make sure that all of the fans on the BladeCenter unit are running. 4. Make sure that each bay of the BladeCenter unit has either a device or a filler installed. 5. Make sure that the blade server is not missing any heat sinks, DIMMs, heat-sink fillers, or DIMM fillers (see Chapter 4, "Parts listing, Types 7871 and 1949," on page 41). 6. Make sure that the CPU heat sink is properly attached to the CPU (see "Installing a microprocessor and heat sink" on page 88). 7. (Trained service technician only) If the error still occurs, replace the microprocessor that controls the failing memory module. See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F010C	Error	Group 1 (All DIMMs) uncorrectable ECC memory error	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Manually re-enable all affected memory modules if the server firmware version is older than UEFI v1.10. If the server firmware version is UEFIv1.10 or newer, disconnect and reconnect the server to the power source and restart the server. 4. Install the affected memory modules (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 5. If the error still occurs on the same memory module, replace the affected memory module. 6. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 8. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F010C	Error	Group 1 (DIMM Status) uncorrectable ECC memory error	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Manually re-enable all affected memory modules if the server firmware version is older than UEFI v1.10. If the server firmware version is UEFIv1.10 or newer, disconnect and reconnect the server to the power source and restart the server. 4. Install the affected memory modules (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 5. If the error still occurs on the same memory module, replace the affected memory module. 6. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 8. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F010C	Error	Group 1 (DIMM Status) uncorrectable ECC memory error	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Manually re-enable all affected memory modules if the server firmware version is older than UEFI v1.10. If the server firmware version is UEFIv1.10 or newer, disconnect and reconnect the server to the power source and restart the server. 4. Install the affected memory modules (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 5. If the error still occurs on the same memory module, replace the affected memory module. 6. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 8. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F010C	Error	Group 1 (One of the DIMMs) uncorrectable ECC memory error	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Manually re-enable all affected memory modules if the server firmware version is older than UEFI v1.10. If the server firmware version is UEFIv1.10 or newer, disconnect and reconnect the server to the power source and restart the server. 4. Install the affected memory modules (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 5. If the error still occurs on the same memory module, replace the affected memory module. 6. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 8. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F010C	Error	Memory device *X* (DIMM *X* Status) uncorrectable ECC memory error [Note: *X*=1-18]	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Manually re-enable all affected memory modules if the server firmware version is older than UEFI v1.10. If the server firmware version is UEFIv1.10 or newer, disconnect and reconnect the server to the power source and restart the server. 4. Install the affected memory modules (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 5. If the error still occurs on the same memory module, replace the affected memory module. 6. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 8. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).
0x806F010D	Error	Hard drive *X* (Drive *X* Status) fault Note: *X*=1-2	Replace the storage drive (see "Removing a SSD storage drive" on page 61 and "Installing a SSD storage drive" on page 62).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0112	Information	Group 4 (CPU Fault Reboot) OEM system boot event	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 3. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled. 4. If the problem continues, replace the processor (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 5. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x806F0207	Error	Group 4, processor (One of CPUs) BIST failure	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 3. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled. 4. If the problem continues, replace the processor (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 5. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0207	Error	Group 4, processor (all CPUs) BIST failure	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 3. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled. 4. If the problem continues, replace the processor (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 5. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x806F0207	Error	Group 4, processor (CPU *X* Status) internal error [Note *X*=1,2]	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 3. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled. 4. If the problem continues, replace the processor (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 5. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0212	Error	Group 4 (CPU Fault Reboot) system hardware failure	No action is needed for this error code. This error indicates a microprocessor fault and will reboot the blade server up to three times to correct the error. If the error continues, error codes 0x806F0007 and 0x806F0807 will be logged. Follow the corrective actions for these error codes.
0x806F020D	Warning	Hard drive 1 (Drive 1 Status) predictive failure	1. Replace the storage drive (see "Removing a SSD storage drive" on page 61 and "Installing a SSD storage drive" on page 62). 2. Make sure that the LSI controller firmware level is up-to-date, upgrade if necessary; then, rerun the test. 3. Make sure that the hard disk drive firmware level is up-to-date, upgrade if necessary; then, rerun the test.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F030C	Error	Memory device *X* (DIMM *X* Status) memory scrub failed [Note: *X*=1-16]	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Manually re-enable all affected memory modules if the server firmware version is older than UEFI v1.10. If the server firmware version is UEFIv1.10 or newer, disconnect and reconnect the server to the power source and restart the server. 4. Install the affected memory modules (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 5. If the error still occurs on the same memory module, replace the affected memory module. 6. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 8. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).
0x806F040C	Information	Group 1 (All DIMMs) memory disabled	1. If the memory module was disabled due to a memory fault (error code 0x806F010C, 0x806F030C, or 0x806F050C), follow the procedure for that event and restart the server. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory event. If no memory fault is recorded in the logs and no DIMM connector error LED is lit, re-enable the memory modules using the Setup utility or the Advanced Settings Utility (ASU).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F040C	Information	Group 1 (One of the DIMMs) memory disabled	1. If the memory module was disabled due to a memory fault (error code 0x806F010C, 0x806F030C, or 0x806F050C), follow the procedure for that event and restart the server. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory event. If no memory fault is recorded in the logs and no DIMM connector error LED is lit, re-enable the memory modules using the Setup utility or the Advanced Settings Utility (ASU).
0x806F040C	Information	Memory device *X* (DIMM *X* Status) memory disabled [Note *X* = 1-18]	1. If the memory module was disabled due to a memory fault (error code 0x806F010c or 0x806F050c), follow the procedure for that event and restart the server. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory event. If no memory fault is recorded in the logs and no DIMM connector error LED is lit, re-enable the memory modules using the Setup utility or the Advanced Settings Utility (ASU).
0x806F0413	Error	Expansion Card 2 (PCI Slot 1) PCI parity error	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Reseat any expansion cards that are installed in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 6. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 7. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 8. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0413	Error	Group 2 (One of PCI Err) PCI parity error	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Reseat any expansion cards that are installed in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 6. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 7. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 8. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0413	Error	Group 2 (All PCI Err) PCI parity error;	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Reseat any expansion cards that are installed in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 6. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 7. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 8. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0413	Error	Expansion Card 3 (PCI Slot 2) PCI parity error	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Reseat any expansion cards that are installed in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 6. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 7. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 8. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x806F0507	Error	Group 4, processor (One of CPUs) configuration error	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 3. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0507	Error	Group 4, processor (All CPUs) configuration error	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 3. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled.
0x806F0507	Error	Group 4, processor (CPU *X* Status) configuration error [Note *X*=1,2]	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 3. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F050C	Error	Group 1 (All DIMMs) correctable ECC memory error logging limit reached	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Install the affected memory modules (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 4. If the error occurs again on the same memory module, replace the affected memory module. 5. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 6. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F050C	Error	Group 1 (DIMM Group Sta) correctable ECC memory error logging limit reached	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Install the affected memory modules (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 4. If the error occurs again on the same memory module, replace the affected memory module. 5. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 6. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F050C	Error	Group 1 (DIMM Status) correctable ECC memory error logging limit reached	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Install the affected memory modules (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 4. If the error occurs again on the same memory module, replace the affected memory module. 5. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 6. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F050C	Error	Group 1 (One of the DIMMs) correctable ECC memory error logging limit reached	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Install the affected memory modules (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 4. If the error occurs again on the same memory module, replace the affected memory module. 5. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 6. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F050C	Error	Memory device *X* (DIMM *X* Status) correctable ECC memory error logging limit reached [Note *X* = 1-18]	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Install the affected memory modules (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 4. If the error occurs again on the same memory module, replace the affected memory module. 5. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 6. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).
0x806F050D	Error	Hard drive *X* (Drive *X* Status) in critical array Note: *X*=1-2	1. Replace the storage drive (see "Removing a SSD storage drive" on page 61 and "Installing a SSD storage drive" on page 62). 2. After the storage drive has been replaced, rebuild the RAID array (see "Configuring a RAID array" on page 35).
0x806F050D	Error	Hard drive *X* (Drive *X* Status) in failed array Note: *X*=1-2	1. Replace the storage drive (see "Removing a SSD storage drive" on page 61 and "Installing a SSD storage drive" on page 62). 2. After the storage drive has been replaced, rebuild the RAID array (see "Configuring a RAID array" on page 35).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0513	Error	Expansion Card 2 (PCI Slot 1) PCI system error	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Reseat any expansion cards that are installed in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 6. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 7. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 8. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0513	Error	Expansion Card 3 (PCI Slot 2) PCI system error	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Reseat any expansion cards that are installed in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 6. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 7. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 8. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0513	Error	Group 2 (All PCI Err) PCI system error	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Reseat any expansion cards that are installed in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 6. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 7. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 8. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0513	Error	Group 2 (One of PCI Err) PCI system error	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. If an expansion card is installed in the blade server, verify that the firmware for each expansion card is up to date. 3. Run the Setup utility and restore system setting to defaults (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. Reseat any expansion cards that are installed in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 6. Remove each expansion card, one at a time until the error does not occur (see "Removing an I/O expansion card" on page 74). 7. Replace failing adapter and reinstall any other expansion cards that were removed (see "Installing an I/O expansion card" on page 78). 8. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x806F052B	Error	System mgmt software, (IMM FW Failover) unsupported software version	This error occurs because service processor (IMM) firmware is corrupted and reverts to a previous version of the firmware. Complete the following steps: 1. Check the IBM support website for an applicable firmware update that applies to the blade server. 2. Restart IMM and verify the IMM is running the correct firmware level after firmware update. For more information about updating firmware and the preferred methods, see *Firmware Update Best Practices* white paper at http://www-947.ibm.com/support/entry/portal/docdisplay?brand=5000020&lndocid=MIGR-5082923

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0607	Error	Group 4, processor (One of CPUs) SM BIOS uncorrectable error	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. (Trained service technician only) If the error still occurs, replace the microprocessors one at a time (see "Removing a microprocessor and heat sink" on page 85 and "Removing a microprocessor and heat sink" on page 85). 3. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x806F0607	Error	Group 4, processor (all CPUs) SM BIOS uncorrectable error	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x806F0607	Error	Processor *X* (CPU *X* Status) SM BIOS uncorrectable error	1. Verify that you have the latest system firmware (see "Firmware updates" on page 33). 2. (Trained service technician only) If the error still occurs, replace microprocessor *X* (see "Removing a microprocessor and heat sink" on page 85 and "Removing a microprocessor and heat sink" on page 85). 3. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0x806F070C	Error	Group 1 (All DIMMs) memory configuration error	Make sure that the memory modules are installed in the correct order and configured correctly (see "Installing a memory module" on page 64).
0x806F070C	Error	Group 1 (DIMM Group Sta) memory configuration error	Make sure that the memory modules are installed in the correct order and configured correctly (see "Installing a memory module" on page 64).
0x806F070C	Error	Group 1 (DIMM Status) memory configuration error	Make sure that the memory modules are installed in the correct order and configured correctly (see "Installing a memory module" on page 64).
0x806F070C	Error	Group 1 (One of the DIMMs) memory configuration error	Make sure that the memory modules are installed in the correct order and configured correctly (see "Installing a memory module" on page 64).
0x806F070C	Error	Memory device *X* (DIMM *X* Status) memory configuration error [Note *X*=1-18	Make sure that the memory modules are installed in the correct order and configured correctly (see "Installing a memory module" on page 64).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0807	Information	Group 4, processor (One of CPUs) disabled	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Check the event logs for other related error messages (see "Error logs" on page 99). 3. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 4. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled.
0x806F0807	Information	Group 4, processor (All CPUs) disabled	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Check the event logs for other related error messages (see "Error logs" on page 99). 3. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 4. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled.
0x806F0807	Information	Processor *X* (CPU *X* Status) disabled [Note *X*=1,2]	1. Remove the blade server and ensure the processors are installed correctly (see "Installing a microprocessor and heat sink" on page 88). 2. Check the event logs for other related error messages (see "Error logs" on page 99). 3. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 4. Run the Setup utility (see "Using the Setup utility" on page 20). a. Make sure that both processors are displayed by the system. b. Load the default settings. c. Go to the **System Settings** menu and make sure the processor is enabled.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0813	Error	Group 2 (Critical Int) bus uncorrectable error	1. Check the operating system event log and the system event log as it may contain additional information (see "Error logs" on page 99). 2. Reseat the blade server in the BladeCenter (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 3. Update the device drivers for any expansion cards that are installed into the blade server. 4. Reseat the expansion card (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 5. Replace the expansion card (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78).
0x806F0813	Error	Group 2 (Critical Int) bus uncorrectable error	1. Check the operating system event log and the system event log as it may contain additional information (see "Error logs" on page 99). 2. Reseat the blade server in the BladeCenter (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 3. Update the device drivers for any expansion cards that are installed into the blade server. 4. Reseat the expansion card (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 5. Replace the expansion card (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78).
0x806F0813	Error	Group 1 (Critical Int) bus uncorrectable error	1. Make sure that the latest firmware is being used (see "Firmware updates" on page 33). 2. Reseat the blade server in the BladeCenter unit (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 3. Run the Setup utility and load the default system settings (see "Using the Setup utility" on page 20). 4. Check the event logs for other related error messages (see "Error logs" on page 99). 5. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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	Type	Error Message	Action
0x806F0813	Error	Group 4 (Critical Int) bus uncorrectable error	1. Verify that the system is running the latest UEFI firmware (see "Firmware updates" on page 33). 2. (Trained service technician only) If the error continues, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

POST error codes

Use this information to diagnose and resolve POST error codes for the blade server.

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 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
0010002	Microprocessor not supported.	1. (Trained service technician) Reseat the following components one at a time in the order shown, restarting the server each time: • Microprocessor 1 (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). • Microprocessor 2, if installed (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 2. (Trained service technician) Complete the following steps: a. Remove microprocessor 2 and restart the server (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). b. If the problem remains, remove microprocessor 1 and install microprocessor 2 in the connector for microprocessor 1; then, restart the server (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). c. If the problem goes away, microprocessor 1 might have failed; replace the microprocessor. 3. (Trained service technician) Replace the following components one at a time in the order shown, restarting the server each time: • Microprocessor 1 (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). • Microprocessor 2, if installed (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). • System board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
001100A	Microcode update failed	1. Update the UEFI firmware (see "Firmware updates" on page 33. 2. (Trained service technician only) Replace the microprocessor.
0011000	Invalid microprocessor type	1. (Trained service technician) Reseat the following components one at a time in the order shown, restarting the server each time: • Microprocessor 1 (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). • Microprocessor 2, if installed (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 2. (Trained service technician) Complete the following steps: a. Remove microprocessor 2 and restart the server (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). b. If the problem remains, remove microprocessor 1 and install microprocessor 2 in the connector for microprocessor 1; then, restart the server (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). c. If the problem goes away, microprocessor 1 might have failed; replace the microprocessor. 3. (Trained service technician) Replace the following components one at a time in the order shown, restarting the server each time: • Microprocessor 1 (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). • Microprocessor 2, if installed (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). • System board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
0011002	Microprocessor mismatch.	1. (Trained service technician) Reseat the following components one at a time in the order shown, restarting the server each time: • Microprocessor 1 (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). • Microprocessor 2, if installed (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 2. (Trained service technician) Complete the following steps: a. Remove microprocessor 2 and restart the server (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). b. If the problem remains, remove microprocessor 1 and install microprocessor 2 in the connector for microprocessor 1; then, restart the server (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). c. If the problem goes away, microprocessor 1 might have failed; replace the microprocessor (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 3. (Trained service technician) Replace the following components one at a time in the order shown, restarting the server each time: • Microprocessor 1 (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). • Microprocessor 2, if installed (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). • System board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
0011004	Microprocessor failed BIST.	1. (Trained service technician) Reseat the following components one at a time in the order shown, restarting the server each time: • Microprocessor 1 (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). • Microprocessor 2, if installed (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 2. (Trained service technician) Complete the following steps: a. Remove microprocessor 2 and restart the server (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). b. If the problem remains, remove microprocessor 1 and install microprocessor 2 in the connector for microprocessor 1; then, restart the server (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). c. If the problem goes away, microprocessor 1 might have failed; replace the microprocessor. 3. (Trained service technician) Replace the following components one at a time in the order shown, restarting the server each time: • Microprocessor 1 (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). • Microprocessor 2, if installed (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). • System board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
0050001	DIMM disabled.	1. If the memory module was disabled due to a memory fault, follow the procedure for that event and restart the server. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory event. If no memory fault is recorded in the logs and no DIMM connector error LED is lit, re-enable the memory modules using the Setup utility or the Advanced Settings Utility (ASU).
005100A	No usable memory detected.	1. Make sure one or more DIMMs are installed in the server. 2. Reseat the DIMMs and restart the server (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 3. Make sure that the DIMMs are installed in the correct sequence (see "Installing a memory module" on page 64 for more information). 4. Clear CMOS memory to ensure that all DIMM connectors are enabled (see "Removing the battery" on page 71 and "Installing the battery" on page 72). Note that all firmware settings will be reset to the default settings.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
0051003	Uncorrectable DIMM error	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Manually re-enable all affected DIMMs if the server firmware version is older than UEFI v1.10. If the server firmware version is UEFIv1.10 or newer, disconnect and reconnect the server to the power source and restart the server. 4. If the problem remains, replace the affected DIMMs. 5. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector contains any foreign material or is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 6. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).
0051006	DIMM mismatch detected.	Make sure that the DIMMs have been installed in the correct sequence (see "Installing a memory module" on page 64).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
0051009	No memory detected.	1. Make sure one or more DIMMs are installed in the server. 2. Reseat the DIMMs and restart the server (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 3. Make sure that the DIMMs have been installed in the correct sequence (see "Installing a memory module" on page 64 for more information). 4. (Trained service technician) Replace the microprocessor that controls the failing DIMMs (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 5. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
00580A1	Unsupported DIMM populated for mirroring mode.	1. If a DIMM connector error LED is lit on the system board, check the event logs and follow the procedure for that event and restart the server. 2. Make sure that the DIMMs have been installed in the correct sequence for mirroring mode (see "Installing a memory module" on page 64).
00580A2	Invalid DIMM population for memory mode.	1. Make sure that the DIMMs are installed in the proper sequence (see "Installing a memory module" on page 64). 2. Reseat the DIMMs and restart the server (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 3. Remove each DIMM one at a time, restarting the server after removing each DIMM until the error is gone (see "Removing a memory module" on page 63). 4. Replace the failed DIMM; then, reinstall the DIMMs to their original connectors and restart the server (see "Installing a memory module" on page 64). 5. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
00580A4	Memory population changed.	Information only. Memory has been added, moved, or changed.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
00580A5	Mirror failover detected.	Information only. Memory redundancy has been lost. Check the event log for uncorrected DIMM failure events (see "Error logs" on page 99).
0058001	PFA threshold exceeded.	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Swap the affected DIMMs (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 4. If the error still occurs on the same DIMM, replace the affected DIMM. 5. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 6. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
0058004	Mirror failover complete.	1. Make sure that the DIMMs are installed in the proper sequence (see "Installing a memory module" on page 64). 2. Reseat the DIMMs and restart the server (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 3. Remove each DIMM one at a time, restarting the server after removing each DIMM until the error is gone (see "Removing a memory module" on page 63). 4. Replace the failed DIMM; then, reinstall the DIMMs to their original connectors and restart the server (see "Installing a memory module" on page 64). 5. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0058006	Spare copy failover complete.	1. Make sure that the DIMMs are installed in the proper sequence (see "Installing a memory module" on page 64). 2. Reseat the DIMMs and restart the server (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 3. Remove each DIMM one at a time, restarting the server after removing each DIMM until the error is gone (see "Removing a memory module" on page 63). 4. Replace the failed DIMM; then, reinstall the DIMMs to their original connectors and restart the server (see "Installing a memory module" on page 64). 5. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0058007	Unsupported DIMM population	1. Reseat the DIMMs and restart the server (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 2. Make sure that the DIMMs are installed in the proper sequence (see "Installing a memory module" on page 64).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
0058008	DIMM failed memory test	1. Refer to TIP H21455 for minimum code level. 2. Check the IBM support website for an applicable retain tip or firmware update that applies to this memory error. 3. Manually re-enable all affected DIMMs if the server firmware version is older than UEFI v1.10. If the server firmware version is UEFIv1.10 or newer, disconnect and reconnect the server to the power source and restart the server. 4. Install the affected DIMMs (as indicated by the error LEDs on the system board or the event logs) to a different memory channel or microprocessor (see "Installing a memory module" on page 64 for memory population sequence). 5. If the error still occurs on the same DIMM, replace the affected DIMM. 6. (Trained service technician only) If the problem occurs on the same DIMM connector, check the DIMM connector. If the connector is damaged, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 7. (Trained service technician only) Remove the affected microprocessor and check the microprocessor socket pins for any damaged pins. If a damage is found, replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 8. (Trained Service technician only) Replace the affected microprocessor (See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
0058009	All DIMM slots disabled. Slot 2 re-enabled, no OS boot.	1. If you disabled the DIMM, run the Setup utility and enable the DIMM (see "Using the Setup utility" on page 20). 2. Make sure that the DIMM is installed correctly (see "Installing the system-board assembly" on page 95 for more information). 3. Reseat the DIMM (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95). 4. Replace the DIMM (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
0068001	Planar POST failure.	1. Restart the server. 2. (Trained service technician only) If the problem remains, replace the system board. See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.
0068002	CMOS battery cleared.	1. Reseat the battery. 2. Clear the CMOS memory (see "System-board switches" on page 15). 3. Replace the following components one at a time in the order shown, restarting the server each time: • Battery (see "Removing the battery" on page 71"Removing the battery" on page 71 and "Installing the battery" on page 72). • (Trained service technician only) System board. See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.
0068003	Event timer failure.	(Trained service technician only) Replace the system board See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
2018001	PCI Express uncorrected or uncorrectable error.	1. Reseat the expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 2. Replace the following components one at a time in the order shown, restarting the server each time: • Expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). • (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
2010000	PCI-X PERR	1. Reseat the expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 2. Replace the following components one at a time in the order shown, restarting the server each time: • Expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). • (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
2010001	PCI-X SERR	1. Reseat the expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 2. Replace the following components one at a time in the order shown, restarting the server each time: • Expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). • (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
2018002	Option Rom resource allocation failure.	1. Run the Setup utility (see "Using the Setup utility" on page 20). Select **Start Options** from the menu and modify the boot sequence so that you change the load order of the optional-device ROM code. 2. Run the Setup utility (see "Using the Setup utility" on page 20) and disable unused resource to make more space available: • Select **Start Options** • Select **Planar Ethernet (PXE/DHCP)** to disable the on-board Ethernet controller ROM. • Select **Advanced Functions**, followed by **PCI Bus Control**, and then **PCI ROM Control Execution** to disable the ROM of the adapters in the PCI slots. • Select **Devices and I/O Ports** to disable any of the on-board devices. 3. If the problem remains, replace the following components one at a time in the order shown, restarting the server each time: • Expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). • (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
2018003	One or more option Roms were disabled.	1. Run the Setup utility (see "Using the Setup utility" on page 20). Select **Start Options** from the menu and modify the boot sequence so that you change the load order of the optional-device ROM code. 2. Run the Setup utility (see "Using the Setup utility" on page 20) and disable unused resource to make more space available: • Select **Start Options** • Select **Planar Ethernet (PXE/DHCP)** to disable the on-board Ethernet controller ROM. • Select **Advanced Functions**, followed by **PCI Bus Control**, and then **PCI ROM Control Execution** to disable the ROM of the adapters in the PCI slots. • Select **Devices and I/O Ports** to disable any of the on-board devices. 3. If the problem remains, replace the following components one at a time in the order shown, restarting the server each time: • Expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). • (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
3018000	TPM communication failure.	(Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
3018001	Primary FW bank signature invalid.	1. Run the Setup utility (see "Using the Setup utility" on page 20), select Load Default Settings, and save the settings. 2. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95)
3018002	Secondary FW bank signature invalid.	1. Run the Setup utility (see "Using the Setup utility" on page 20), select Load Default Settings, and save the settings. 2. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95)

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
3018003	CRTM corrupt image.	1. Run the Setup utility (see "Using the Setup utility" on page 20), select Load Default Settings, and save the settings. 2. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95)
3000007	Illegal software state (halted).	1. Run the Setup utility (see "Using the Setup utility" on page 20). Select **Load Default Settings** and save the settings. 2. Reseat the following components one at a time in the order shown, restarting the server each time: • Battery (see "Removing the battery" on page 71 and "Installing the battery" on page 72). • Expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 3. Replace the following components one at a time in the order shown, restarting the server each time: • Battery (see "Removing the battery" on page 71 and "Installing the battery" on page 72). • Expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). • (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95)

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
3008001	System configuration invalid.	1. Run the Setup utility (see "Using the Setup utility" on page 20). Select **Load Default Settings** and save the settings. 2. Reseat the following components one at a time in the order shown, restarting the server each time: • Battery (see "Removing the battery" on page 71 and "Installing the battery" on page 72). • Expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 3. Replace the following components one at a time in the order shown, restarting the server each time: • Battery (see "Removing the battery" on page 71 and "Installing the battery" on page 72). • Expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). • (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95)
3008002	Date, time, or both are incorrect.	1. Run the Setup utility (see "Using the Setup utility" on page 20). Select **Load Default Settings** and save the settings. 2. Reseat the following components one at a time in the order shown, restarting the server each time: • Battery (see "Removing the battery" on page 71 and "Installing the battery" on page 72). • Expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). 3. Replace the following components one at a time in the order shown, restarting the server each time: • Battery (see "Removing the battery" on page 71 and "Installing the battery" on page 72). • Expansion cards (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). • (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95)

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
3008003	Firmware corrupt.	1. Run the Setup utility (see "Using the Setup utility" on page 20). Select **Load Default Settings** and save the settings. 2. Follow the UEFI recovery procedure in "Recovering from a UEFI update failure" on page 212. 3. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95)
3008004	Three boot failure.	1. Run the Setup utility (see "Using the Setup utility" on page 20). Select **Load Default Settings** and save the settings. 2. Update the firmware to the latest level (see "Firmware updates" on page 33for more information). 3. Reseat the following components one at a time in the order shown, restarting the server each time: • Battery (see "Removing the battery" on page 71 and "Installing the battery" on page 72). • (Trained service technician only) Microprocessor (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). 4. Replace the following components one at a time in the order shown, restarting the server each time: • Battery (see "Removing the battery" on page 71 and "Installing the battery" on page 72). • (Trained service technician only) Microprocessor (see "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88). • (Trained service technician only) System board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
3048005	Booted secondary (backup) UEFI image.	Set SW1–4 and SW1–5 to the primary position (see "System-board switches" on page 15).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
3048006	Booted secondary (backup) UEFI image due to ABR.	1. Run the Setup utility (see "Using the Setup utility" on page 20). Select **Load Default Settings** and save the settings. 2. Follow the UEFI recovery procedure in "Recovering from a UEFI update failure" on page 212.
3138002	Boot configuration error.	1. Run the Setup utility and remove any recent changes made to the settings (see "Using the Setup utility" on page 20). 2. Run the Setup utility (see "Using the Setup utility" on page 20). Select **Load Default Settings** and save the settings.
3008000	IMM communication failure.	1. Reseat the blade server (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 2. Update the IMM firmware (see "Firmware updates" on page 33). 3. (Trained service technician only) If the problem remains, replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
3008001	IMM incompatible firmware level.	1. Reseat the blade server (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 2. Update the IMM firmware (see "Firmware updates" on page 33). 3. (Trained service technician only) If the problem remains, replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
3008002	Configuration update to IMM failed.	1. Reseat the blade server (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 2. Update the IMM firmware (see "Firmware updates" on page 33). 3. (Trained service technician only) If the problem remains, replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).**
- **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
3008003	Configuration retrieval from IMM failed.	1. Reseat the blade server (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 2. Update the IMM firmware (see "Firmware updates" on page 33). 3. (Trained service technician only) If the problem remains, replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
3008004	IMM system event log full.	Clear system event logs using the Setup utility (see "Setup utility menu" on page 20.
3008005	IMM not detected.	1. Reseat the blade server (see "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53). 2. Update the IMM firmware (see "Firmware updates" on page 33). 3. (Trained service technician only) If the problem remains, replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

Checkout procedure

Use this information to perform the checkout procedure for the blade server.

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

About the checkout procedure

Use this information to run diagnostics, locate error codes, and identify device errors for the blade server.

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

- Read "Safety" on page v and "Installation guidelines" on page 49.
- 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.
- If the blade server is halted and a POST error code is displayed, see "POST error codes" on page 144. If the blade server is halted and no error message is displayed, see "Troubleshooting tables" on page 164 and "Solving undetermined problems" on page 222.
- For intermittent problems, check the error log; see "Error logs" on page 99 and "Dynamic system analysis diagnostic programs and messages" on page 185.
- If no LEDs are lit on the blade server front panel, verify the blade server status and errors in the Advanced-Management-Module Web interface; also see "Solving undetermined problems" on page 222.
- If device errors occur, see "Troubleshooting tables" on page 164.

Performing the checkout procedure

Use this information to perform the checkout procedure for the blade server.

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 LED on the keyboard/video/mouse button is lit). If the blade server does not start, see "Troubleshooting tables" on page 164.
3. Record any 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 144.
4. Check the control panel blade-error LED; if it is lit, check the light path diagnostics LEDs (see "Light path diagnostics" on page 181).
5. Check for the following results:
   - Successful completion of POST, indicated by beginning the startup of the operating system.
   - Successful completion of startup, indicated by a readable display of the operating-system desktop.

Troubleshooting tables

Use this information to troubleshoot problems in the blade server.

Use the troubleshooting tables to find solutions to problems that have identifiable symptoms. If these symptoms are related to shared BladeCenter unit resources, see "Solving shared BladeCenter resource problems" on page 217.

If you cannot find a problem in these tables, see Chapter 6, "Diagnostics," on page 97 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 you use 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. For more information, see "POST" on page 98.
3. Reinstall the new software or new device. For more information, see the documentation that came with the new software or device.

General problems

Use this information to resolve a general hardware problem.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

• **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 - See "Removing and replacing Tier 1 customer replaceable units (CRUs)" on page 55 to replace the failed component. • If the part is a FRU, the part must be replaced by a trained service technician. See "Removing and replacing field replaceable units" on page 85. Or contact an IBM service representative, see "Hardware service and support" on page 227.
The server is hung while the screen is on. Cannot start the Setup utility by pressing F1.	1. See "Nx boot failure" on page 216 for more information. 2. See "Recovering from a UEFI update failure" on page 212 for more information.

Storage drive problems

Use this information to resolve storage 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 4, "Parts listing, Types 7871 and 1949," on page 41 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 storage drives are recognized by the Fixed Disk or SAS Attached Disk diagnostic test.	1. Remove the storage drive that is indicated by the diagnostic tests. See Chapter 5, "Removing and replacing blade server components," on page 49. 2. Run the SAS Fixed Disk or SAS Attached Disk diagnostic test again. See "Diagnostic tools overview" on page 97. 3. If the Fixed drive or SAS Attached Disk diagnostic test runs successfully, replace the storage drive that you removed with a new one. See Chapter 5, "Removing and replacing blade server components," on page 49.
The blade server stops responding during the Fixed Disk or SAS Attached Disk diagnostic test.	1. Remove the storage drive that was being tested when the blade server stopped responding. See Chapter 5, "Removing and replacing blade server components," on page 49. 2. Run the SAS Fixed Disk or SAS Attached Disk diagnostic test again (see "Diagnostic tools overview" on page 97). 3. If the Fixed drive or SAS Attached Disk diagnostic test runs successfully, replace the storage drive that you removed with a new one. See Chapter 5, "Removing and replacing blade server components," on page 49.
A storage drive passes the Fixed Disk or SAS Attached Disk diagnostics test, but the problem remains.	1. Run the SAS Fixed Disk or SAS Attached Disk diagnostic test again. See "Diagnostic tools overview" on page 97. 2. If the Fixed drive or SAS Attached Disk diagnostic test runs successfully but the storage drive continues to have a problem, replace the drive with a new one.

Intermittent problems

Use this information to resolve intermittent problems with the blade server.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

• **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 storage drives are configured correctly. 2. Check the AMM and IMM logs for an error message (see "Error logs" on page 99). 3. Make sure that the UEFI and IMM firmware level is up-to-date, update if necessary. 4. See "Solving undetermined problems" on page 222.

Keyboard or mouse problems

Use this information to lookup and resolve keyboard or mouse problems.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. 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 217.

• **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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. Check the function of the shared BladeCenter unit resources (see "Solving shared BladeCenter resource problems" on page 217). 3. Make sure that: • The device drivers are installed correctly. See "Firmware updates" on page 33 • 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. 4. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.

Memory problems

Use this information to diagnose and resolve memory problems with the blade server.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 is less than the amount of installed physical memory.	1. Make sure that: • You have installed the correct type of memory (see "Installing a memory module" on page 64). • If you changed the memory, you updated the memory configuration in the Setup utility (see "Using the Setup utility" on page 20). • 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 (see "Using the Setup utility" on page 20). 2. Check the IMM event log for a memory error (see "Viewing event logs through the Setup utility" on page 99): • If a DIMM was disabled by a systems-management interrupt (SMI), replace the DIMM (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). • If a DIMM was disabled by the user or by POST, run the Setup utility and enable the DIMM (see "Using the Setup utility" on page 20). 3. Reseat the DIMM, and the optional expansion unit, if one is installed (see "Removing a memory module" on page 63, "Installing a memory module" on page 64, "Removing an optional expansion unit" on page 57, and "Installing an optional expansion unit" on page 58). 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: a. Optional expansion unit, if one is installed (see "Removing an optional expansion unit" on page 57, and "Installing an optional expansion unit" on page 58) b. DIMM (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). c. (Trained service technician only) System-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
Multiple rows of DIMMs in a branch are identified as failing.	1. Make sure that the DIMMs are installed in the proper sequence (see "Installing a memory module" on page 64). 2. Reseat the DIMMs and restart the server (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 3. Remove each DIMM one at a time, restarting the server after removing each DIMM until the error is gone (see "Removing a memory module" on page 63). 4. Replace the failed DIMM; then, reinstall the DIMMs to their original connectors and restart the server (see "Installing a memory module" on page 64). 5. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

Monitor or video problems

Use this information to diagnose and resolve monitor or video errors.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

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 217.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 217). 2. Make sure that the blade server is turned on (see "Turning on the blade server" on page 13). 3. Make sure that the monitor is connected properly. See the documentation for your BladeCenter unit for more information. 4. Make sure that: • Damaged BIOS code is not affecting the video; see "Recovering from a UEFI update failure" on page 212. • The device drivers are installed correctly. 5. Follow the UEFI recovery procedure in "Recovering from a UEFI update failure" on page 212). 6. (Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
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 217). 2. (Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).
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 217). 3. (Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

Network connection problems

Use this information to diagnose and resolve network connection errors.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. The blade server connects to the network by using shared BladeCenter unit resources. See the following table and "Solving shared BladeCenter resource problems" on page 217.

• **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 217). 2. Make sure that: • The correct device drivers are installed. See "Firmware updates" on page 33. • The Ethernet controller is correctly configured. See "Configuring the Gigabit Ethernet controller" on page 34. • Optional I/O expansion cards are correctly installed and configured. See "Installing an I/O expansion card" on page 78 and Chapter 3, "Configuring the blade server," on page 19. 3. (Trained service technician only) Replace the system-board assembly. See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.

Optional-device problems

Use this information to diagnose and resolve optional-device problems.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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. See the instructions that came with the device. • You have not loosened any other installed devices or cables. • You updated the configuration information in the Setup utility program. Whenever memory or any other device is changed, you must update the configuration. See "Setup utility menu" on page 20. 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. See "Removing and replacing field replaceable units" on page 85. 4. Replace the device that you just installed. See "Removing and replacing field replaceable units" on page 85.

Power error messages

Use this information to diagnose and resolve power error messages for the blade server.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. Power to the blade server is provided by shared BladeCenter unit resources. See the following table and "Solving shared BladeCenter resource problems" on page 217.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 Power Good fault	1. Reseat the blade server - See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 2. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 217. 3. If an optional expansion unit is installed, reseat it - See "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: a. Optional expansion unit (if one is installed) - See "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58. b. (Trained service technician only) System-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.
VRD Power Good fault	1. Reseat the blade server - See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 2. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 217. 3. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.
System over recommended voltage for +12 V.	Informational only. **Note:** If the problem remains, complete the following steps: 1. Reseat the blade server - See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 2. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 217. 3. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 over recommended voltage for +0.9 V.	Informational only. **Note:** If the problem remains, complete the following steps: 1. Reseat the blade server - See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 2. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 217. 3. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.
System over recommended voltage for +3.3 V.	Informational only. **Note:** If the problem remains, complete the following steps: 1. Reseat the blade server - See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 2. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 217. 3. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.
System over recommended 5 V fault.	Informational only. **Note:** If the problem remains, complete the following steps: 1. Reseat the blade server - See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 2. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 217. 3. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.
System under recommended voltage for +12 V.	Informational only. **Note:** If the problem remains, complete the following steps: 1. Reseat the blade server - See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 2. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 217. 3. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 +0.9 V.	Informational only. **Note:** If the problem remains, complete the following steps: 1. Reseat the blade server - See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 2. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 217. 3. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.
System under recommended voltage for +3.3 V.	Informational only. **Note:** If the problem remains, complete the following steps: 1. Reseat the blade server - See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 2. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 217. 3. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.
System under recommended +5 V fault.	Informational only. **Note:** If the problem remains, complete the following steps: 1. Reseat the blade server - See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 2. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 217. 3. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.

Power problems

Use this information to diagnose and resolve power problems for the blade server.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

• **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 power-control button does not work.	1. Reseat the control-panel connector - See "Blade server controls and LEDs" on page 10. 2. Replace the bezel assembly - See "Removing the bezel assembly" on page 59 and "Installing the bezel assembly" on page 60. 3. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 217. 2. Make sure that the power-on LED on the blade server control panel is flashing slowly. See "Blade server controls and LEDs" on page 10. • If the power LED is flashing rapidly and continues to do so, the blade server is not communicating with the Advanced Management Module; reseat the blade server. See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. • If the power LED is off, the blade server bay is not receiving power, the blade server is defective, or the LED information panel is loose or defective. See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 3. Check the power-management policies in the operating system for the blade server. See the *Advanced Management Module User's Guide* for more information (see "Related documentation" on page 6). 4. Check the Advanced-Management-Module log of the corresponding blade server for an error that is preventing the blade server from turning on. See "Error logs" on page 99. 5. Reseat the blade server - See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 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 server bay supports. 7. If you tried another blade server in the blade server bay when you check the function of the shared BladeCenter unit resources and the other blade server worked, complete the following tasks on the blade server that you removed: a. If an optional expansion unit is installed, reseat it - See "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58. b. Replace the following components one at a time, in the order shown, restarting the blade server each time: 1) Optional expansion unit (if one is installed) - See "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58. 2) (Trained service technician only) System-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95. 8. See "Solving undetermined problems" on page 222.
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 217. 2. (Trained service technician only) If the microprocessor error LED is lit, replace the microprocessor - See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88. 3. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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. See "Blade server controls and LEDs" on page 10. 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. See "Removing the blade server from the BladeCenter unit" on page 52 and "Installing the blade server in a BladeCenter unit" on page 53. 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. See the *Advanced Management Module User's Guide* for more information (see "Related documentation" on page 6). b. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.

Removable-media drive problems

Use this information to diagnose and resolve removable-media drive problems in the blade server.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved. 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 217.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 217. 3. Run the Setup utility and make sure that the drive is enabled. See "Setup utility menu" on page 20. 4. For SAS storage drive problems, make sure that the correct device driver is installed. For the latest device drivers, go to http://www.ibm.com/systems/support/. 5. Reseat the battery - See "Removing the battery" on page 71 and "Installing the battery" on page 72. 6. Replace the battery - See "Removing the battery" on page 71 and "Installing the battery" on page 72. 7. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.

The CD or DVD drive is detected as /dev/sr0 by SUSE Linux. (If the SUSE Linux operating system is installed remotely on 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`

ServerGuide problems

Use this information to locate ServerGuide problems and suggested actions.

The following table lists problem symptoms and suggested solutions.

Symptom	Suggested action
The *ServerGuide Setup and Installation* CD will not start.	• Make sure that the CD drive is associated with the blade server that you are configuring. • Make sure that the blade server supports the ServerGuide program and has a bootable CD (or DVD) drive. • If the startup (boot) sequence settings have been changed, make sure that the CD drive is first in the startup sequence.
The RAID configuration program cannot view all installed drives, or the operating system cannot be installed.	• Make sure that there are no duplicate SCSI/SAS IDs or interrupt request (IRQ) assignments. See "Configuring a RAID array" on page 35. • Make sure that the storage drive is connected correctly. See "Blade server connectors" on page 14 to locate the storage drive connector.
The operating-system installation program continuously loops.	Make more space available on the hard disk.
The ServerGuide program will not start the operating-system CD.	Make sure that the operating-system CD is supported by the ServerGuide program. See the *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 operating system is supported on the blade server. If the operating system is supported, either no logical drive is defined (SCSI/SAS RAID systems) or the ServerGuide System Partition is not present. Run the ServerGuide program and make sure that setup is complete.

Software problems

Use this information to diagnose and resolve software problems for the blade server.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

• **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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 receive any error messages while you use 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

Use this information to diagnose and resolve USB port problems in the blade server.

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 217.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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. 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. 2. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 217. 3. Make sure that: • The operating system supports USB devices. • The correct USB device driver is installed. For the latest device drivers, go to http://www.ibm.com/support/. 4. (Trained service technician only) Replace the system-board assembly. See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.

Light path diagnostics

Use this information as an overview of 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:

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

Viewing the light path diagnostics LEDs

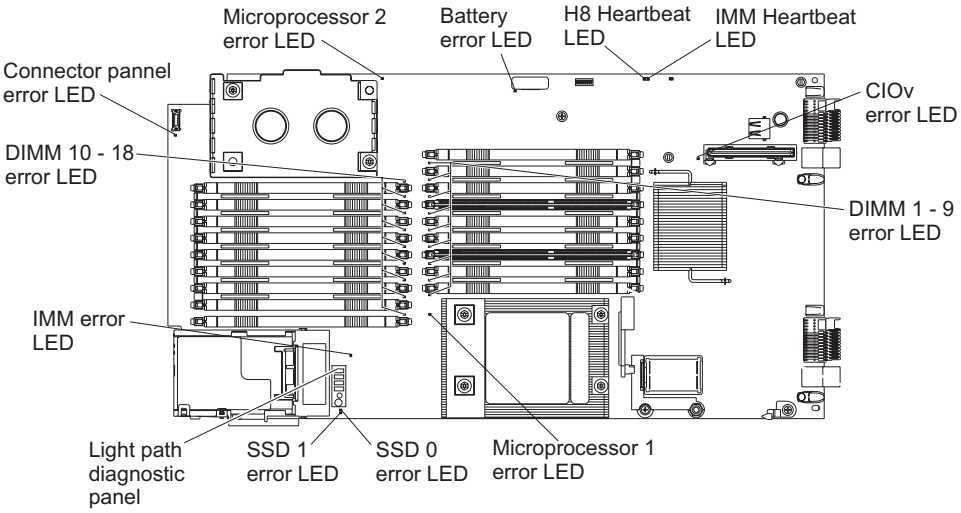
Use this information to locate and identify the light path diagnostics LEDs.

Before you work inside the blade server to view light path diagnostics LEDs, read "Safety" on page v and "Installation guidelines" on page 49.

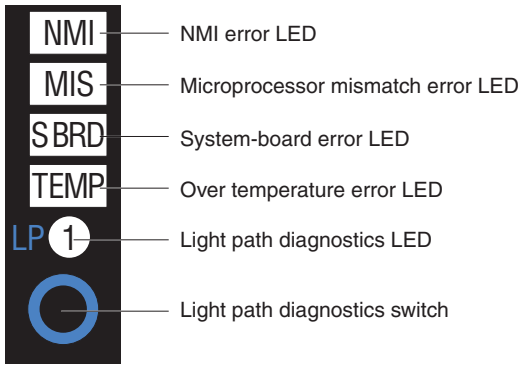
If an error occurs, view the light path diagnostics LEDs in the following order:

1. Look at the control panel on the front of the blade server (see "Blade server controls and LEDs" on page 10).
   - If the information LED is lit, it indicates that information about a suboptimal condition in the blade server is available in the IMM log or in the Advanced-Management-Module event log.
   - If the blade-error LED is lit, it indicates that an error has occurred; view the light path diagnostics panel and LEDs to isolate the failing component.
2. To view the light path diagnostics panel and LEDs, complete the following steps:
   a. Remove the blade server from the BladeCenter unit. See "Removing the blade server from the BladeCenter unit" on page 52.
   b. Place the blade server on a flat, static-protective surface.
   c. Remove the cover from the blade server. See "Removing the blade server cover" on page 55.
   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.



The following illustrations show the system-board light path diagnostics panel and LEDs on the system-board light path diagnostics panel.



Light path diagnostics LEDs

Use this information to diagnose and resolve possible errors displayed by the light path diagnostic LEDs.

The following table describes the LEDs on the light path diagnostics panels, on the system board, and on the optional expansion unit 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 4, "Parts listing, Types 7871 and 1949," on page 41 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. See "Viewing the light path diagnostics LEDs" on page 181. 2. Check the BMC log for information about an error that is not represented by a light path diagnostics LED. See "Using the Setup utility" on page 20.
Battery error	The system battery is not installed or is not working.	1. Reseat the battery. See "Removing the battery" on page 71 and "Installing the battery" on page 72. 2. Replace the battery. See "Removing the battery" on page 71 and "Installing the battery" on page 72.
DIMM x error	A memory error occurred.	Look for system-event and IMM/AMM logs related to memory and resolve those events (see "IMM error messages" on page 101 and "POST error codes" on page 144
LP1	• LP1 LED on system board: system-board assembly light path diagnostic LEDs have power. • LP1 LED on optional expansion unit: check light path LEDs on the system board.	Check for error LEDs that are lit on the system-board assembly. See "Viewing the light path diagnostics LEDs" on page 181.
LP2 (optional expansion unit only)	Light path diagnostic LEDs on the optional expansion unit have power.	Check for error LEDs that are lit on the optional expansion unit. See "Viewing the light path diagnostics LEDs" on page 181.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
Microprocessor error	The microprocessor has failed or overheated, or the start microprocessor is missing.	1. Check the AMM event logs. 2. If the log shows that a microprocessor is disabled or that a microprocessor error has occurred, perform one of the following actions: a. (Trained service technician only) Reseat the microprocessor that is indicated by the lit LED. See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88. b. (Trained service technician only) Replace the microprocessor that is indicated by the lit LED. See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88.
MIS	Microprocessor mismatch.	Make sure that microprocessors 1 and 2 are identical (number of cores, cache size and type, clock speed, internal and external clock frequencies). 1. Verify the type of microprocessors installed by using the Configuration/Setup utility. See "Using the Setup utility" on page 20. 2. (Trained service technician only) Replace microprocessor 2 with an identical microprocessor to microprocessor 1. See "Removing a microprocessor and heat sink" on page 85 and "Installing a microprocessor and heat sink" on page 88.
NMI (NMI error)	The system board has failed.	1. Replace the blade server cover, reinsert the blade server in the BladeCenter unit, and then restart the blade server. Check the BMC log for information about the error. See "Using the Setup utility" on page 20. 2. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.
SAS storage drive error	A storage drive has failed.	Run the SAS Attached Disk diagnostic test. If the drives passes diagnostics but continues to have a problem, replace the storage drive with a new one. See "Dynamic system analysis diagnostic programs and messages" on page 185.

- **Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.**
- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
SYS BRD (System board error)	The system board has failed	(Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95.
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 217. 2. Make sure the air vents are not blocked and that all blade bays in the BladeCenter unit have a blade server or a blade filler installed. 3. Make sure that the room temperature is not too high. See "Features and specifications" on page 8 for temperature information.

Dynamic system analysis diagnostic programs and messages

Use this information to learn more about using the dynamic system analysis (DSA) diagnostic programs and messages to resolve blade server errors.

The Dynamic System Analysis (DSA) Preboot diagnostic programs are the primary method of testing the major components of the server. DSA is a system information collection and analysis tool that you can use to provide information IBM service and support to aid in the diagnosis of the system problems.

As you run the diagnostic programs, text messages are displayed on the screen and are saved in the test log. A diagnostic text message indicates that a problem has been detected and provides the action you should take as a result of the text message. The diagnostic programs collect the following information about the blade server:

- System configuration
- Network interfaces and settings
- Installed hardware
- Light path diagnostics status
- Vital product data, firmware, and UEFI configuration
- Hard disk drive health
- Baseboard Management Controller logs

The DSA diagnostic programs can also provide diagnostics for the following system components, if they are installed in the system:

- BroadCom Ethernet controller

- Optical (CD or DVD) drives
- Storage drives
- LSI 1064e SAS RAID controller
- Baseboard management controller
- Memory
- Microprocessor

The diagnostic programs create a merged log, called the DSA error log, that includes events from all collected logs. You can output all of the collected XML file that you can send to the IBM service and support, view the information locally through a generated text report file, or copy the log to a removable media and view the log from a Web browser. See "Running the diagnostic programs" for more information.

If you cannot find the problem using the diagnostic programs, see "Solving undetermined problems" on page 222 for information about testing the blade server.

Running the diagnostic programs

Use this information to start the diagnostic programs for the blade server.

Important: The DSA diagnostic programs do not support USB CD-ROM drives. If you run the DSA diagnostic programs while any USB CD-ROM drives are attached, ignore any optical drive test results that are returned for USB CD-ROM drives. You can also remove USB CD-ROM drives before you run the DSA diagnostic programs to get accurate optical drive test results.

To run the DSA Preboot diagnostic programs, complete the following steps:

1. If the blade server is running, turn off the blade server and all attached devices.
2. Turn on all attached devices; then, turn on the blade server.
3. When the prompt `<F2> Diagnostics` is displayed, press F2.

   Note: The DSA Preboot diagnostic program might appear to be unresponsive for an unusual length of time when you start the program. This is normal operation while the program loads.
4. Optionally, select **Quit to DSA** to exit from the stand-alone memory diagnostic program.

   Note: After you exit from the stand-alone memory diagnostic environment, you must restart the server to access the stand-alone memory diagnostic environment again.
5. Select **gui** to display the graphical user interface, or select **cmd** to display the DSA interactive menu.
6. Follow the instructions on the screen to select the diagnostic test to run.

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 messages" on page 188.

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.

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

Use this information to understand the diagnostic text messages that display 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

Use this information to view the test log of the blade server.

You can use one of the following methods to access the test log when the tests are completed:

- From the DSA command line, issue the DSA CLI View command or select the Diagnostic Event Log option from the DSA graphical user interface (GUI)
- From the DSA interactive menu, select the `getextendedresults` option.
- From the DSA interactive menu, select the View option to view all of the collected results and error log data.
- In the DSA GUI, select DSA Error Log from the System Information page.

You can send the DSA error log file to IBM service and support to aid in diagnosing the server problems or you can use the DSA CLI copy command to copy the log to an external USB device.

Diagnostic messages

Use this information to review the diagnostic error messages and resolve any errors that might occur in the blade server.

If the diagnostic programs generate error codes that are not listed in the table, make sure that the latest level of the UEFI code is installed. To download the latest firmware for the blade server, go to http://www.ibm.com/systems/support/.

The following table describes the messages that the diagnostic programs might generate and suggested actions to correct the detected problems. Follow the suggested actions in the order in which they are listed in the action column. 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 187 for more information.

Broadcom Ethernet device tests

Use this information to resolve Broadcom Ethernet device errors.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

• **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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**
405-000-xxx	Passed the EEPROM test on the system board.	N/A
405-001-xxx	Passed the MII registers test.	N/A
405-002-xxx	Passed the EEPROM test on the system board.	N/A
405-003-xxx	Passed the Internal memory test.	N/A
405-004-xxx	Passed the interrupt test.	N/A
405-005-xxx	Passed the MAC layer loopback test.	N/A
405-007-xxx	Passed LED test.	N/A
405-901-xxx	Test control registers.	1. Make sure that the component firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 2. If the failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.
405-902-xxx	Failed the MII registers test.	1. Make sure that the component firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 2. If the failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
405-903-xxx	Failed the EEPROM test on the system board.	1. Make sure that the component firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 2. If the failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.
405-904-xxx	Failed the Internal memory test.	1. Make sure that the component firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 2. If the failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.
405-905-xxx	Failed interrupt test.	1. Make sure that the component firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 2. If the failure remains, check interrupt assignments in the PCI Hardware section of the DSA Diagnostic Log. If the Ethernet device is sharing interrupts, modify the interrupt assignments using the Setup utility to assign a unique interrupt to the device (see "Using the Setup utility" on page 20). 3. If the failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
405-906-xxx	Failed MAC layer loopback test.	1. Make sure that the component firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 2. If the failure remains, check interrupt assignments in the PCI Hardware section of the DSA Diagnostic Log. If the Ethernet device is sharing interrupts, modify the interrupt assignments using the Setup utility to assign a unique interrupt to the device (see "Using the Setup utility" on page 20). 3. If the failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.
405-908-xxx	Failed LED test.	1. Make sure that the component firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 2. If the failure remains, check interrupt assignments in the PCI Hardware section of the DSA Diagnostic Log. If the Ethernet device is sharing interrupts, modify the interrupt assignments using the Setup utility to assign a unique interrupt to the device (see "Using the Setup utility" on page 20). 3. If the failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.

CPU stress tests

Use this information to view CPU stress test error codes and resolve CPU stress test errors.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
089-801-xxx	Aborted due to an internal program error.	1. If the blade server has stopped responding, turn off and restart the blade server. See "Turning off the blade server" on page 13 and "Turning on the blade server" on page 13. 2. Make sure that the DSA Diagnostic code is up-to-date, upgrade if necessary; then, rerun the test. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Make sure that the system firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 4. If the blade server has stopped responding, turn off and restart the blade server; then, rerun the test. See "Turning off the blade server" on page 13 and "Turning on the blade server" on page 13. 5. (Trained service technician only) If the component failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
089-802-xxx	Aborted due a system resource availability error.	1. Make sure at least 1 GB of memory is installed in the blade server (see "Installing a memory module" on page 64). 2. Make sure that the DSA Diagnostic code is up-to-date, upgrade if necessary; then, rerun the test. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Make sure that the system firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T. 4. If the blade server has stopped responding, turn off and restart the blade server; then, rerun the test. See "Turning off the blade server" on page 13 and "Turning on the blade server" on page 13. 5. (Trained service technician only) If the component failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
089-803-000	CPU test aborted. Memory size is insufficient to run the test. At least 1 GB is required.	1. If the blade server has stopped responding, turn off and restart the blade server; then, rerun the test. See "Turning off the blade server" on page 13 and "Turning on the blade server" on page 13. 2. Run the test again. 3. If the error continues, make sure that the DSA Diagnostic code is up-to-date, upgrade if necessary; then, rerun the test. up-to-date, upgrade if necessary. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 4. Make sure that the system firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 5. If the blade server has stopped responding, turn off and restart the blade server; then, rerun the test. 6. (Trained service technician only) If the component failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
089-901-xxx	Failed the CPU stress test.	1. If the blade server has stopped responding, turn off and restart the blade server; then, rerun the test. See "Turning off the blade server" on page 13 and "Turning on the blade server" on page 13. 2. Make sure that the DSA Diagnostic code is up-to-date, upgrade if necessary; then, rerun the test. up-to-date, upgrade if necessary. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Make sure that the system firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 4. If the blade server has stopped responding, turn off and restart the blade server; then, rerun the test. 5. (Trained service technician only) If the component failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.

IMM I2C tests

Use this information to resolve IMM I2C-test errors by referencing the error codes and following the suggested corrective actions.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
166-901-xxx	Failed the IMM I2C test due to a failure in the host bus.	1. Turn off the blade server, open the blade server release levers and pull the blade server away from the blade server bay, but do not remove it. See "Removing the blade server from the BladeCenter unit" on page 52. 2. Wait 45 seconds and reseat the blade server in the blade server bay and turn on the blade server. See "Installing the blade server in a BladeCenter unit" on page 53 and "Turning on the blade server" on page 13. 3. Rerun the test. See "Diagnostic tools overview" on page 97. 4. Make sure that the DSA Diagnostic code is up-to-date, upgrade if necessary; then, rerun the test. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 5. Make sure that the component firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T. 6. Turn off the blade server and reseat the blade server in the blade server bay and turn on the blade server. See "Removing the blade server from the BladeCenter unit" on page 52 and "Turning on the blade server" on page 13. 7. Rerun the test. See "Diagnostic tools overview" on page 97. 8. If the failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
166-903-xxx	Failed the IMM I2C test due to a failure in the DIMM bus.	1. Turn off the blade server, open the blade server release levers and pull the blade server away from the blade module bay, but do not remove it. See "Removing the blade server from the BladeCenter unit" on page 52 for more information. 2. Wait 45 seconds and reseat the blade server in the blade module bay and turn on the blade server. See "Installing the blade server in a BladeCenter unit" on page 53 and "Turning on the blade server" on page 13. 3. Rerun the test. See "Diagnostic tools overview" on page 97. 4. Make sure that the DSA Diagnostic code is up-to-date, upgrade if necessary; then, rerun the test. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 5. Make sure that the component firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T. 6. Reseat the DIMMs (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 7. Rerun the test. 8. If the error occurs, replace one DIMM at a time until the error is resolved (see "Removing a memory module" on page 63 and "Installing a memory module" on page 64). 9. Rerun the test. 10. (Trained service technician) If the failure remains, replace the system-board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
166-904-xxx	Failed the IMM I2C test indicates failure in the blade expansion unit, high-speed daughter card, or light path diagnostics panel.	1. Turn off the blade server, open the blade server release levers and pull the blade server away from the blade server bay, but do not remove it. See "Removing the blade server from the BladeCenter unit" on page 52 for more information. 2. Wait 45 seconds and reseat the blade server in the blade module bay and turn on the blade server. See "Installing the blade server in a BladeCenter unit" on page 53 and "Turning on the blade server" on page 13. 3. Rerun the test. See "Diagnostic tools overview" on page 97. 4. Make sure that the DSA Diagnostic code is up-to-date, upgrade if necessary; then, rerun the test. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 5. Make sure that the component firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T. 6. Reseat the following components: a. Reseat the expansion unit, if one is installed (see "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58). b. Reseat all high-speed expansion cards in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). c. Reseat the bezel and control-panel cable (see "Removing the bezel assembly" on page 59 and "Installing the bezel assembly" on page 60) 7. Rerun the test. See "Diagnostic tools overview" on page 97. 8. (Trained service technician) If the failure remains, replace the system-board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
166-906-xxx	Failed the IMM I2C test due to a failure in the memory configuration bus.	1. Turn off the blade server, open the blade server release levers and pull the blade server away from the blade server bay, but do not remove it from the bay. See "Removing the blade server from the BladeCenter unit" on page 52 for more information. 2. Wait 45 seconds and reseat the blade server in the blade module bay and turn on the blade server. See "Installing the blade server in a BladeCenter unit" on page 53 and "Turning on the blade server" on page 13. 3. Rerun the test. See "Diagnostic tools overview" on page 97. 4. Make sure that the DSA Diagnostic code is up-to-date, upgrade if necessary; then, rerun the test. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 5. Make sure that the IMM firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T. 6. Turn off the blade server, open the blade server release levers and pull the blade server away from the blade server bay, but do not remove it from the bay. See "Removing the blade server from the BladeCenter unit" on page 52 for more information. 7. Wait 45 seconds and reseat the blade server in the blade module bay and turn on the blade server. See "Installing the blade server in a BladeCenter unit" on page 53 and "Turning on the blade server" on page 13. 8. Rerun the test. See "Diagnostic tools overview" on page 97. 9. (Trained service technician) If the failure remains, replace the system-board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
166-920-xxx	Failed the IMM I2C test due to a failure in the EXP A0 bus.	1. Turn off the blade server, open the blade server release levers and pull the blade server away from the blade server bay, but do not remove it. See "Removing the blade server from the BladeCenter unit" on page 52 for more information. 2. Wait 45 seconds and reseat the blade server in the blade module bay and turn on the blade server. See "Installing the blade server in a BladeCenter unit" on page 53 and "Turning on the blade server" on page 13. 3. Rerun the test. See "Diagnostic tools overview" on page 97. 4. Make sure that the DSA Diagnostic code is up-to-date, upgrade if necessary; then, rerun the test. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 5. Make sure that the IMM firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T. 6. Reseat the expansion unit, if one is installed (see "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58). 7. Rerun the test. See "Diagnostic tools overview" on page 97. 8. (Trained service technician) If the failure remains, replace the system-board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
166-921-xxx	Failed the IMM I2C test due to a failure in the EXP A1 bus.	1. Turn off the blade server, open the blade server release levers and pull the blade server away from the blade server bay, but do not remove it. See "Removing the blade server from the BladeCenter unit" on page 52 for more information. 2. Wait 45 seconds and reseat the blade server in the blade module bay and turn on the blade server. See "Installing the blade server in a BladeCenter unit" on page 53 and "Turning on the blade server" on page 13. 3. Rerun the test. See "Diagnostic tools overview" on page 97. 4. Make sure that the DSA Diagnostic code is up-to-date, upgrade if necessary; then, rerun the test. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 5. Make sure that the IMM firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T. 6. Reseat the following components: a. Reseat the expansion unit, if one is installed (see "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58). b. Reseat all high-speed expansion cards in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). c. Reseat the bezel and control-panel cable (see "Removing the bezel assembly" on page 59 and "Installing the bezel assembly" on page 60) 7. Rerun the test. See "Diagnostic tools overview" on page 97. 8. (Trained service technician) If the failure remains, replace the system-board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
166-922-xxx	Failed the IMM I2C test due to a failure in the EXP A2 bus.	1. Turn off the blade server, open the blade server release levers and pull the blade server away from the blade server bay, but do not remove it. See "Removing the blade server from the BladeCenter unit" on page 52 for more information. 2. Wait 45 seconds and reseat the blade server in the blade module bay and turn on the blade server. See "Installing the blade server in a BladeCenter unit" on page 53 and "Turning on the blade server" on page 13. 3. Rerun the test. See "Diagnostic tools overview" on page 97. 4. Make sure that the DSA Diagnostic code is up-to-date, upgrade if necessary; then, rerun the test. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 5. Make sure that the IMM firmware level is up-to-date, upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T. 6. Reseat the following components: a. Reseat the expansion unit, if one is installed (see "Removing an optional expansion unit" on page 57 and "Installing an optional expansion unit" on page 58). b. Reseat all high-speed expansion cards in the blade server (see "Removing an I/O expansion card" on page 74 and "Installing an I/O expansion card" on page 78). c. Reseat the bezel and control-panel cable (see "Removing the bezel assembly" on page 59 and "Installing the bezel assembly" on page 60) 7. Rerun the test. See "Diagnostic tools overview" on page 97. 8. (Trained service technician) If the failure remains, replace the system-board (see "Removing the system-board assembly" on page 94 and "Installing the system-board assembly" on page 95).

Memory I2C tests

Use this information to diagnose and resolve memory test errors.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
210-000-xxx	Passed the memory test.	N/A
202-801-xxx	Test aborted due to internal program error.	1. If the blade server has stopped responding, turn off the blade server and pull it out of the bay to disconnect it from power. See "Turning off the blade server" on page 13 and "Removing the blade server from the BladeCenter unit" on page 52. 2. Make sure that the DSA Diagnostic code is at the latest level; then, rerun the test ("Diagnostic tools overview" on page 97). The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Make sure that the system BIOS firmware is at the latest level, upgrade if necessary; then, rerun the test ("Diagnostic tools overview" on page 97). The BIOS firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 4. Reseat the DIMMs. See "Removing a memory module" on page 63 and "Installing a memory module" on page 64. 5. If the component failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failing DIMMs.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
202-802-xxx	Test failed. Memory size is insufficient to run the test.	1. Make sure all of the installed memory is enabled in the Setup utility (see "Using the Setup utility" on page 20). 2. Make sure that the DSA Diagnostic code is at the latest level; then, rerun the test ("Diagnostic tools overview" on page 97). The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Make sure that the system BIOS firmware is at the latest level, upgrade if necessary; then, rerun the test ("Diagnostic tools overview" on page 97). The BIOS firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 4. Reseat the DIMMs. See "Removing a memory module" on page 63 and "Installing a memory module" on page 64. 5. If the component failure remains, refer to "Removing a memory module" on page 63 and "Installing a memory module" on page 64 to replace the failing DIMMs.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
201-901-xxx	Failed the memory stress test.	1. If the blade server has stopped responding, turn off the blade server and pull it out of the bay to disconnect it from power. See "Turning off the blade server" on page 13 and "Removing the blade server from the BladeCenter unit" on page 52. 2. Make sure that the DSA Diagnostic code is at the latest level; then, rerun the test ("Diagnostic tools overview" on page 97). The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Make sure that the system BIOS firmware is at the latest level, upgrade if necessary; then, rerun the test ("Diagnostic tools overview" on page 97). The BIOS firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 4. Reseat the DIMMs. See "Removing a memory module" on page 63 and "Installing a memory module" on page 64. 5. If the component failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failing DIMMs.

Optical drive

Use this information to diagnose and resolve optical drive self-test errors.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
215-000-xxx	Passed the optical drive self test.	N/A
215-801-xxx	Aborted the optical drive self test because it was unable to communicate with the device driver.	1. Make sure that the DSA Diagnostic code is at the latest level, upgrade if necessary; then, rerun the test ("Diagnostic tools overview" on page 97). The latest code can be found IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 2. Make sure that the cable for the optical drive is securely connected at both ends of the cable, then; tighten any loose connections. See your BladeCenter documentation for information about replacing the optical drive (media tray). 3. Make sure that the cable for the optical drive is not damaged, then; replace the cable if damage is present. See your BladeCenter documentation for information about replacing the optical drive. 4. Rerun the test. See "Diagnostic tools overview" on page 97. 5. For additional troubleshooting information, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559. 6. Make sure that the system firmware level is at the latest level and upgrade if necessary; then, rerun the test. The installed firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017 7. Rerun the test. See "Diagnostic tools overview" on page 97. 8. Replace the CD or DVD drive. See your BladeCenter documentation for information about replacing the optical drive (media tray). 9. If the failure remains, collect the data from the DSA event log and sent it to IBM Service. For information about contacting and sending data to IBM Service, see "Hardware service and support" on page 227.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
215-802-xxx	Aborted the optical drive self test due to media tray being open.	1. Insert a new CD or DVD into the drive and wait for 15 seconds for the media to be recognized. Rerun the test. See your BladeCenter documentation for information about the optical drive (media tray). 2. Rerun the test. See "Diagnostic tools overview" on page 97. 3. Make sure that the cable for the optical drive is securely connected at both ends of the cable and tighten any loose connections. See your BladeCenter documentation for information about the optical drive (media tray). 4. Make sure that the cable for the optical drive is not damaged and replace the cable if damage is present. See your BladeCenter documentation for information about the optical drive (media tray). 5. Rerun the test. See "Diagnostic tools overview" on page 97. 6. Make sure that the DSA Diagnostic code is at the latest level, upgrade if necessary. The latest code can be found at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 7. Rerun the test. See "Diagnostic tools overview" on page 97. 8. For additional troubleshooting information, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559. 9. Rerun the test. See "Diagnostic tools overview" on page 97. 10. Replace the CD or DVD drive (media tray). See your BladeCenter documentation for information about replacing the optical drive. 11. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see "Hardware service and support" on page 227.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
215-803-xxx	Failed the optical drive self test due to the disk possibly being in use by the system.	1. Wait for the system activity to stop; then, rerun the test. See . 2. Turn off and turn on the system, then; rerun the test. See "Turning off the blade server" on page 13, "Turning on the blade server" on page 13 and "Diagnostic tools overview" on page 97. 3. If the component failure remains, see your BladeCenter documentation for information about replacing the optical drive (media tray). 4. If the failure remains, collect the data from the DSA event log ("Diagnostic tools overview" on page 97) and send it to IBM Service. For information about contacting and sending data to IBM Service, see "Hardware service and support" on page 227.
215-901-xxx	Aborted the optical drive self test because the drive media was not detected.	1. Insert a new CD or DVD into the drive and wait for 15 seconds for the media to be recognized; then, rerun the test. See"Diagnostic tools overview" on page 97. 2. Make sure that the cable for the optical drive is securely connected at both ends of the cable and tighten any loose connections. See your BladeCenter documentation for information about the optical drive (media tray). 3. Make sure that the cable for the optical drive is not damaged and replace the cable if damage is present. See your BladeCenter documentation for information about the optical drive (media tray). 4. Rerun the test. See "Diagnostic tools overview" on page 97. 5. For additional troubleshooting information, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559. 6. Rerun the test. See"Diagnostic tools overview" on page 97. 7. Replace the CD or DVD drive. See your BladeCenter documentation for information about replacing the optical drive (media tray). 8. If the failure remains, collect the data from the DSA event log ("Diagnostic tools overview" on page 97) and send it to IBM Service. For information about contacting and sending data to IBM Service, see "Hardware service and support" on page 227.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
215-902-xxx	Failed the optical drive self test due to a read miscompare.	1. Insert a new CD or DVD into the drive and wait for 15 seconds for the media to be recognized; then, rerun the test. See "Diagnostic tools overview" on page 97. 2. Make sure that the cable for the optical drive is securely connected at both ends of the cable and tighten any loose connections. See your BladeCenter documentation for information about the optical drive (media tray). 3. Make sure that the cable for the optical drive is not damaged and replace the cable if damage is present. See your BladeCenter documentation for information about the optical drive (media tray). 4. Rerun the test. See"Diagnostic tools overview" on page 97. 5. For additional troubleshooting information, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559. 6. Rerun the test. See "Diagnostic tools overview" on page 97. 7. Replace the CD or DVD drive. See your BladeCenter documentation for information about replacing the optical drive (media tray). 8. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see "Hardware service and support" on page 227.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
215-903-xxx	Aborted the optical drive self test because the drive could not be accessed.	1. Insert a new CD or DVD into the optical drive and wait for 15 seconds for the media to be recognized; then, rerun the test. See "Diagnostic tools overview" on page 97. 2. Make sure that the cable for the optical drive is securely connected at both ends of the cable. See your BladeCenter documentation for information about the optical drive (media tray). 3. Make sure that the cable for the optical drive is not damaged; then, replace the cable if damage is present. See your BladeCenter documentation for information about replacing the optical drive (media tray). 4. Make sure that the DSA Diagnostic code is at the latest level and upgrade if necessary; then, rerun the test. The latest code can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 5. For additional troubleshooting information, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559. 6. Rerun the test. See "Diagnostic tools overview" on page 97. 7. Replace the CD or DVD drive. Refer to your BladeCenter documentation for information about replacing the drive. 8. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see "Hardware service and support" on page 227.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
215-904-xxx	Failed the optical drive self test due to a possible read error.	1. Insert a new CD or DVD into the optical drive and wait for 15 seconds for the media to be recognized; then, rerun the test. See "Diagnostic tools overview" on page 97. 2. Make sure that the cable for the optical drive is securely connected at both ends of the cable. See your BladeCenter documentation for information about the optical drive (media tray). 3. Make sure that the cable for the optical drive is not damaged; then, replace the cable if damage is present. See your BladeCenter documentation for information about replacing the optical drive (media tray). 4. Rerun the test. See "Diagnostic tools overview" on page 97. 5. For additional troubleshooting information, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559. 6. Rerun the test. See "Diagnostic tools overview" on page 97. 7. Replace the CD or DVD drive. See your BladeCenter documentation for information about replacing the optical drive (media tray). 8. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see "Hardware service and support" on page 227.

Tape alert flags

Use this information to diagnose and resolve tape alert flags for the blade server.

Tape alert flags are numbered 1 through 64 and indicate a specific media-changer error condition. Each tape alert is returned as an individual log parameter, and its state is indicated in bit 0 of the 1-byte Parameter Value field of the log parameter. When this bit is set to 1, the alert is active.

Each tape alert flag has one of the following severity levels:

C - Critical
W - Warning
I - Information

Different tape drives support some or all of the following flags in the tape alert log:

Flag 2: Library Hardware B (W) This flag is set when an unrecoverable mechanical error occurs.

Flag 4: Library Hardware D (C) This flag is set when the tape drive fails the power-on self-test or a mechanical error occurs that requires a power cycle to recover. This flag is internally cleared when the drive is powered-off.

Flag 13: Library Pick Retry (W) This flag is set when a high retry count threshold is passed during an operation to pick a cartridge from a slot before the operation succeeds. This flag is internally cleared when another pick operation is attempted.

Flag 14: Library Place Retry (W) This flag is set when a high retry count threshold is passed during an operation to place a cartridge back into a slot before the operation succeeds. This flag is internally cleared when another place operation is attempted.

Flag 15: Library Load Retry (W) This flag is set when a high retry count threshold is passed during an operation to load a cartridge into a drive before the operation succeeds. This flag is internally cleared when another load operation is attempted. Note that if the load operation fails because of a media or drive problem, the drive sets the applicable tape alert flags.

Flag 16: Library Door (C) This flag is set when media move operations cannot be performed because a door is open. This flag is internally cleared when the door is closed.

Flag 23: Library Scan Retry (W) This flag is set when a high retry count threshold is passed during an operation to scan the bar code on a cartridge before the operation succeeds. This flag is internally cleared when another bar code scanning operation is attempted.

Service processor (IMM) error codes

Use this information to view the IMM error log.

The Integrated Management Module (IMM) 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 IMM log from the Configuration/Setup Utility menu by selecting **Advanced Setup → Integrated Management Module(IMM) Settings → IMM System Event Log**.

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

Recovering from a UEFI update failure

Use this information to recover from a UEFI update failure in the blade server.

Important: Some cluster solutions require specific code levels or coordinated code updates. If the device is part of a cluster solution, verify that the latest level of code is supported for the cluster solution before you update the code.

If the server firmware has become corrupted, such as from a power failure during an update, you can recover the server firmware in one of four ways:

- **In-band manual recovery method** (See “In-band manual recovery method” on page 213.)
- **Out-of-band manual recovery method** (See “Out-of-band manual recovery method” on page 214.)
- **In-band automated boot recovery method** (See “In-band automated boot recovery method” on page 215.)
- **Out-of-band automated boot recovery method** (See “Out-of-band automated boot recovery method” on page 215.)

In-band manual recovery method

To recover the server firmware and restore the server operation to the primary bank, complete the following steps:

1. Download the blade server UEFI firmware update from the World Wide Web (see "Firmware updates" on page 33).
2. Turn off the server (see "Turning off the blade server" on page 13).
3. Remove the blade server from the BladeCenter unit (see "Removing the blade server from the BladeCenter unit" on page 52).
4. Remove the server cover. See "Removing the blade server cover" on page 55 for more information.
5. Locate the UEFI boot block recovery switch (SW1-5) on the system board (see "System-board switches" on page 15).
6. Use your finger to move switch SW1-5 to the ON position.
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. See "Closing the blade server cover" on page 56 and "Installing the blade server in a BladeCenter unit" on page 53.
8. Restart the blade server (see "Turning on the blade server" on page 13). The system begins the power-on self-test (POST).
9. Boot the server to an operating system that is supported by the firmware update package that you downloaded.
10. Perform the firmware update by following the instructions that are in the firmware update package readme file.
11. Copy the downloaded firmware update package into a directory.
12. From a command line, type *filename*`-s`, where *filename* is the name of the executable file that you downloaded with the firmware update package.
13. Reboot the server and verify that it completes POST (see "Turning off the blade server" on page 13 and "Turning on the blade server" on page 13).
14. Turn off the server (see "Turning off the blade server" on page 13).
15. Remove the blade server form the BladeCenter unit (see "Removing the blade server from the BladeCenter unit" on page 52).
16. Remove the server cover. See "Removing the blade server cover" on page 55.
17. Move the UEFI boot block recovery switch (SW1-5) to the OFF position (see "System-board switches" on page 15).
18. 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. See "Closing the blade server cover" on page 56 and "Installing the blade server in a BladeCenter unit" on page 53.
19. Restart the blade server (see "Turning off the blade server" on page 13 and "Turning on the blade server" on page 13). The system begins the power-on self-test (POST).If this does not recover the primary bank continue with the following steps.
20. Remove the blade server form the BladeCenter unit (see "Removing the blade server from the BladeCenter unit" on page 52).
21. Remove the server cover. See "Removing the blade server cover" on page 55.
22. Reset the CMOS by removing the battery (see "Removing the battery" on page 71).
23. Leave the battery out of the server for 5 minutes.
24. Reinstall the battery (see "Installing the battery" on page 72).

25. 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. See “Closing the blade server cover” on page 56 and “Installing the blade server in a BladeCenter unit” on page 53.
26. Restart the blade server (see “Turning on the blade server” on page 13).

The system begins the power-on self-test (POST).

Out-of-band manual recovery method

To recover the server firmware and restore the server operation to the primary bank, complete the following steps:

1. Download the blade server UEFI firmware update from the World Wide Web (see “Firmware updates” on page 33).
2. Turn off the server (see “Turning off the blade server” on page 13).
3. Remove the blade server from the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 52).
4. Remove the server cover. See “Removing the blade server cover” on page 55 for more information.
5. Locate the UEFI boot block recovery switch (SW1-5) on the system board (see “System-board switches” on page 15).
6. Use your finger to move switch SW1-5 to the ON position.
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. See “Closing the blade server cover” on page 56 and “Installing the blade server in a BladeCenter unit” on page 53.
8. Restart the blade server (see “Turning on the blade server” on page 13). The system begins the power-on self-test (POST).
9. Boot the server to the operating system or the F1 UEFI configuration menu.
10. Log into the Advanced Management's web interface.
11. After you log in, select **MM Control -> Network Protocol** and ensure that TFTP is enabled on the management module. The default setting is disable.
12. Select **Blade Tasks -> Firmware update** and select the blade server you want to recover.
13. Use the browse button to point to the UEFI update file.
14. Click the **Update** button to update the UEFI firmware.
15. Reboot the server and verify that it completes POST (see “Turning off the blade server” on page 13 and “Turning on the blade server” on page 13).
16. Turn off the server (see “Turning off the blade server” on page 13).
17. Remove the blade server form the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 52).
18. Remove the server cover. See “Removing the blade server cover” on page 55.
19. Move the UEFI boot block recovery switch (SW1-5) to the OFF position (see “System-board switches” on page 15).
20. 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. See “Closing the blade server cover” on page 56 and “Installing the blade server in a BladeCenter unit” on page 53.

21. Restart the blade server (see “Turning off the blade server” on page 13 and “Turning on the blade server” on page 13). The system begins the power-on self-test (POST). If this does not recover the primary bank continue with the following steps.
22. Remove the blade server form the BladeCenter unit (see “Removing the blade server from the BladeCenter unit” on page 52).
23. Remove the server cover. See “Removing the blade server cover” on page 55.
24. Reset the CMOS by removing the battery (see “Removing the battery” on page 71).
25. Leave the battery out of the server for 5 minutes.
26. Reinstall the battery (see “Installing the battery” on page 72).
27. 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. See “Closing the blade server cover” on page 56 and “Installing the blade server in a BladeCenter unit” on page 53.
28. Restart the blade server (see “Turning on the blade server” on page 13).

The system begins the power-on self-test (POST).

In-band automated boot recovery method

To download the server UEFI firmware update package from the World Wide Web, complete the following steps.

Note: Use this method if the SYS BRD LED on the light path diagnostics panel is lit and there is an AMM event log entry or Booting Backup Image is displayed on the firmware splash screen; otherwise, use the in-band manual recovery method.

1. Download the blade server UEFI firmware update from the World Wide Web (see “Firmware updates” on page 33).
2. Boot the server to an operating system that is supported by the firmware update package that you downloaded (see “Turning on the blade server” on page 13).
3. Perform the firmware update by following the instructions that are in the firmware update package readme file.
4. Restart the server (see “Turning off the blade server” on page 13 and “Turning on the blade server” on page 13).
5. At the firmware splash screen, press F3 when prompted to restore to the primary bank. The server boots from the primary bank.

Out-of-band automated boot recovery method

To download the server UEFI firmware update package from the World Wide Web, complete the following steps.

Note: Use this method if the SYS BRD LED on the light path diagnostics panel is lit and there is an AMM event log entry or Booting Backup Image is displayed on the firmware splash screen; otherwise, use the out-of-band manual recovery method.

1. Download the blade server UEFI firmware update for your blade server (see “Firmware updates” on page 33).
2. Log into the Advanced Management Module's web interface.
3. After you log in, select **MM Control** → **Network Protocols** and ensure that TFTP is enabled on the management module. It is disabled by default.

4. Select **Blade Tasks** → **Firmware update** and select the blade server to recover.
5. Use the browse button to point to the UEFI update file.
6. Click the **Update** button to update the UEFI firmware.
7. Restart the server (see "Turning off the blade server" on page 13 and "Turning on the blade server" on page 13).
8. At the firmware splash screen, press F3 when prompted to restore to the primary bank. The server boots from the primary bank.

Nx boot failure

Configuration changes, such as added devices or adapter firmware updates, and firmware or application code problems can cause the server to fail POST (the power-on self-test). If this occurs, the server responds in either of the following ways:

- The server restarts automatically and attempts POST again.
- The server hangs, and you must manually restart the server for the server to attempt POST again.

After a specified number of consecutive attempts (automatic or manual), the Nx boot failure feature causes the server to revert to the default UEFI configuration and start the Setup utility so that you can make the necessary corrections to the configuration and restart the server. If the server is unable to successfully complete POST with the default configuration, there might be a problem with the system board.

To specify the number of consecutive restart attempts that will trigger the Nx boot failure feature, complete the following steps:

1. In the Setup utility, click **System Settings** > **Operating Modes** > **POST Attempts Limit**.
2. The available options are 3, 6, 9, and 255 (disable Nx boot failure). Select your option.

Automated boot recovery (ABR)

While the server is starting, if the integrated management module detects problems with the server firmware in the primary bank, the server automatically switches to the backup firmware bank and gives you the opportunity to recover the firmware in the primary bank. For instructions for recovering the UEFI firmware, see "Recovering from a UEFI update failure" on page 212. After you have recovered the firmware in the primary bank, complete the following steps:

1. Restart the server.
2. When the prompt `Press F3 to restore to primary` is displayed, press F3 to start the server from the primary bank.

Solving SAS hard disk drive problems

Use this information to diagnose and resolve SAS hard disk drive issues.

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 incorrect SAS configuration

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

Solving shared BladeCenter resource problems

Use this information to diagnose and resolve shared BladeCenter resource issues.

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* for your BladeCenter unit and other BladeCenter component documentation for additional information. If the problem cannot be solved, see "Solving undetermined problems" on page 222.

To check the general function of shared BladeCenter resources, complete the following tasks:

- Make sure that:
  - The BladeCenter unit has the required power modules and is connected to a working power source.
  - Power management has been correctly set for your BladeCenter unit configuration.
- Determine whether 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 server bay.
- Try a known-good blade server in the blade server bay.

Keyboard or mouse problems

Use this information to diagnose and resolve keyboard and mouse issues.

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 Advanced Management Module.
   - The keyboard or mouse works with another blade server.
2. Check for correct Advanced-Management-Module operation (see the documentation for your BladeCenter unit).

   Note: Some BladeCenter unit types have several management-module components that might have to be tested or replaced (see the *Installation Guide* for your Advanced Management Module for more information).
3. Replace the keyboard or mouse.
4. Replace the Advanced Management Module (see the documentation for your BladeCenter unit).

If these steps do not solve the problem, it is likely a problem with the blade server. See "Keyboard or mouse problems" on page 166.

Media tray problems

Use this information to diagnose and resolve media tray issues for the blade server.

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. Determine whether the problem affects more than one media tray component:
   - USB ports
   - Diskette drive
   - CD or DVD drive
3. For problems that affect only a USB port:
   a. Make sure that the USB device is operational. If you are using a USB hub, make sure that the hub is operating correctly and that any software that the hub requires is installed. Connect the USB device directly to 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 "Media tray problems."
4. For problems that affect only the diskette drive, make sure that:
   a. The diskette is inserted correctly in the drive.
   b. The diskette is good and not damaged; the drive LED flashes once per second when the diskette is inserted. (Try another diskette if you have one.)
   c. The diskette contains the necessary files to start the blade server.
   d. The software program is working correctly.
   e. The distance between monitors and diskette drives is at least 76 mm (3 in.).
5. For problems that affect only the CD or DVD drive, make sure that:
   a. 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.
   b. The CD or DVD is clean and not damaged. (Try another CD or DVD if you have one.)
   c. The software program is working properly.
6. For problems that affect 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

7. Check for correct Advanced-Management-Module operation (see the documentation for your BladeCenter unit).

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

If these steps do not solve the problem, it is likely a problem with the blade server. See "Removable-media drive problems" on page 177 or "Universal Serial Bus (USB) port problems" on page 180.

Network connection problems

Use this information to diagnose and resolve network connection issues with the blade server.

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 I/O-module 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 have to be tested or replaced (see the *Installation Guide* for your Advanced Management Module for more information).
4. Replace the Advanced Management Module (see the documentation for your BladeCenter unit).

If these steps do not solve the problem, it is likely a problem with the blade server. See "Network connection problems" on page 169.

Power problems

Use this information to diagnose and resolve power issues with the blade server.

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.
- The BladeCenter unit support installation of the blade server type.
- The BladeCenter unit has the correct power configuration to operate the blade server bay where the 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 *Advanced 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 *Advanced Management Module Command-Line Interface Reference Guide* for information).
- The power-on LED on the blade server flashes slowly before you press the power-control button.

  Note: While the service processor in the blade server is initializing and synchronizing with the management module, the power-on LED flashes rapidly, and the power-control button on the blade server does not respond. This process can take approximately two minutes after the blade server has been installed.
- The BladeCenter unit blowers are correctly installed and operational.

If these procedures do not solve the problem, it is likely a problem with the blade server. See "Power error messages" on page 171 and "Power problems" on page 174.

Video problems

Use this information to diagnose and resolve video issues .

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 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 Advanced 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 Advanced-Management-Module operation (see the documentation for your BladeCenter unit).

   Note: Some BladeCenter unit types have several management-module components that might have to be tested or replaced (see the *Installation Guide* for your Advanced Management Module for more information).
3. Replace the monitor cable, if applicable.
4. Replace the monitor.
5. Replace the Advanced Management Module (see the documentation for your BladeCenter unit).

If these steps do not solve the problem, it is likely a problem with the blade server. See "Monitor or video problems" on page 168.

Storage drive tests

Use this information to diagnose and resolve storage drive test problems for the blade server.

Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.

- **See Chapter 4, "Parts listing, Types 7871 and 1949," on page 41 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
217-000-000	Passed the storage drive test.	N/A
217-800-xxx	The storage drive test was terminated by the user.	N/A
217-900-xxx	Failed the storage drive test.	1. Reseat the storage drive (see "Installing a SSD storage drive" on page 62 and "Removing a SSD storage drive" on page 61). 2. Rerun the test. 3. Make sure that the system BIOS firmware is at the latest level, upgrade if necessary; then, rerun the test. The BIOS firmware level can be found in the DSA Diagnostic Event Log within the Firmware/VPD section for this component. The latest level firmware for this component can be found on the IBM support Web site at http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63017. 4. Rerun the test. 5. If the component failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 49 to replace the failed component.

Solving undetermined problems

Use this information to diagnose and resolve undetermined issues with the blade server.

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 178.

Damaged data in CMOS memory or damaged UEFI 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 71. If you suspect that the UEFI code is damaged, see "Recovering from a UEFI update failure" on page 212.

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 "Blade server connectors" on page 14 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 Advanced Management Module (see the documentation for the BladeCenter unit and Advanced 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.
   - Storage 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

Use these tips to determine problems with the blade server.

Because of the variety of hardware and software combinations that you can encounter, use the following information to assist you in problem determination. If possible, have this information available when you request assistance from IBM.

- Machine type and model
- Microprocessor and hard disk drive upgrades
- Failure symptoms
  - Does the blade server fail the diagnostic tests?
  - What occurs? When? Where?
  - Does the failure occur on a single server or on multiple servers?
  - Is the failure repeatable?
  - Has this configuration ever worked?
  - What changes, if any, were made before the configuration failed?
  - Is this the original reported failure?
- Diagnostic program type and version level
- Hardware configuration (print screen of the system summary)
- UEFI 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
- UEFI 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. 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.

Use this information to obtain additional information about IBM and IBM products, determine what to do if you experience a problem with your IBM system or optional device, and determine 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.

If you believe that you require IBM to perform warranty service on your IBM product, the IBM service technicians will be able to assist you more efficiently if you prepare before you call.

- 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.
- Check for updated software, firmware, and operating-system device drivers for your IBM product. The IBM Warranty terms and conditions state that you, the owner of the IBM product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your IBM service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
- If you have installed new hardware or software in your environment, check http://www.ibm.com/systems/info/x86servers/serverproven/compat/us to make sure that the hardware and software is supported by your IBM product.
- Go to http://www.ibm.com/supportportal to check for information to help you solve the problem.
- Gather the following information to provide to IBM Support. This data will help IBM Support quickly provide a solution to your problem and ensure that you receive the level of service for which you might have contracted.
  - Hardware and Software Maintenance agreement contract numbers, if applicable
  - Machine type number (IBM 4-digit machine identifier)
  - Model number
  - Serial number
  - Current system UEFI and firmware levels
  - Other pertinent information such as error messages and logs
- Go to http://www.ibm.com/support/entry/portal/Open_service_request to submit an Electronic Service Request. Submitting an Electronic Service Request will start the process of determining a solution to your problem by making the pertinent information available to IBM Support quickly and efficiently. IBM service technicians can start working on your solution as soon as you have completed and submitted an Electronic Service Request.

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/supportportal.

Getting help and information from the World Wide Web

Up-to-date information about IBM products and support is available on the World Wide Web.

On the World Wide Web, up-to-date information about IBM systems, optional devices, services, and support is available at http://www.ibm.com/supportportal. IBM System x information is at http://www.ibm.com/systems/x. IBM BladeCenter information is at http://www.ibm.com/systems/bladecenter. IBM IntelliStation information is at http://www.ibm.com/systems/intellistation.

How to send DSA data to IBM

Use the IBM Enhanced Customer Data Repository to send diagnostic data to IBM.

Before you send diagnostic data to IBM, read the terms of use at http://www.ibm.com/de/support/ecurep/terms.html.

You can use any of the following methods to send diagnostic data to IBM:

- **Standard upload:** http://www.ibm.com/de/support/ecurep/send_http.html
- **Standard upload with the system serial number:** http://www.ecurep.ibm.com/app/upload_hw
- **Secure upload:** http://www.ibm.com/de/support/ecurep/send_http.html#secure
- **Secure upload with the system serial number:** https://www.ecurep.ibm.com/app/upload_hw

Creating a personalized support web page

You can create a personalized support web page by identifying IBM products that are of interest to you.

To create a personalized support web page, go to http://www.ibm.com/support/mynotifications. From this personalized page, you can subscribe to weekly email notifications about new technical documents, search for information and downloads, and access various administrative services.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with your IBM products.

For information about which products are supported by Support Line in your country or region, see http://www.ibm.com/services/supline/products.

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

Hardware service and support

You can receive hardware service through your IBM reseller or IBM Services.

To locate a reseller authorized by IBM to provide warranty service, go to http://www.ibm.com/partnerworld and click **Business Partner Locator**. For IBM support telephone numbers, see http://www.ibm.com/planetwide. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

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

IBM Taiwan product service

Use this information to contact IBM Taiwan product service.

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

Notices

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Important notes

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

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

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.

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

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

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

Each solid-state memory cell has an intrinsic, finite number of write cycles that the cell can incur. Therefore, a solid-state device has a maximum number of write cycles that it can be subjected to, expressed as `total bytes written` (TBW). A device that has exceeded this limit might fail to respond to system-generated commands or might be incapable of being written to. IBM is not responsible for replacement of a device that has exceeded its maximum guaranteed number of program/erase cycles, as documented in the Official Published Specifications for the device.

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Particulate contamination

Attention: Airborne particulates (including metal flakes or particles) and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the device that is described in this document.

Risks that are posed by the presence of excessive particulate levels or concentrations of harmful gases include damage that might cause the device to malfunction or cease functioning altogether. This specification sets forth limits for particulates and gases that are intended to avoid such damage. The limits must not be viewed or used as definitive limits, because numerous other factors, such as temperature or moisture content of the air, can influence the impact of particulates or environmental corrosives and gaseous contaminant transfer. In the absence of specific limits that are set forth in this document, you must implement practices that maintain particulate and gas levels that are consistent with the protection of human health and safety. If IBM determines that the levels of particulates or gases in your environment have caused damage to the device, IBM may condition provision of repair or replacement of devices or parts on implementation of appropriate remedial measures to mitigate such environmental contamination. Implementation of such remedial measures is a customer responsibility.

Table 10. Limits for particulates and gases

Contaminant	Limits
Particulate	• The room air must be continuously filtered with 40% atmospheric dust spot efficiency (MERV 9) according to ASHRAE Standard 52.2[1]. • Air that enters a data center must be filtered to 99.97% efficiency or greater, using high-efficiency particulate air (HEPA) filters that meet MIL-STD-282. • The deliquescent relative humidity of the particulate contamination must be more than 60%[2]. • The room must be free of conductive contamination such as zinc whiskers.
Gaseous	• Copper: Class G1 as per ANSI/ISA 71.04-1985[3] • Silver: Corrosion rate of less than 300 Å in 30 days

Table 10. Limits for particulates and gases (continued)

Contaminant	Limits
[1] ASHRAE 52.2-2008 - *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size*. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. [2] The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction. [3] ANSI/ISA-71.04-1985. *Environmental conditions for process measurement and control systems: Airborne contaminants*. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.	

Documentation format

The publications for this product are in Adobe Portable Document Format (PDF) and should be compliant with accessibility standards. If you experience difficulties when you use the PDF files and want to request a web-based format or accessible PDF document for a publication, direct your mail to the following address:

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When you attach a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices that are supplied with the monitor.

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

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

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

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Responsible manufacturer:

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Germany Class A statement

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

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International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
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Der verantwortliche Ansprechpartner des Herstellers in der EU ist:

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IBM-Allee 1, 71139 Ehningen, Germany
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Email: lugi@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

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В жилых помещениях оно может создавать радиопомехи, для снижения которых необходимы дополнительные меры

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中华人民共和国“A类”警告声明

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