



BladeCenter HS12
Type 8014, 8028 or 1916
Problem Determination and Service Guide





BladeCenter HS12
Type 8014, 8028 or 1916
Problem Determination and Service Guide

Note: Before using this information and the product it supports, read the general information in “Notices” on page 175 and the *Warranty and Support Information* document for your blade server type on the IBM *Documentation* CD.

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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.

بھارتی
پاکستان
ایران
ترکی
عراق
سعودی عرب
قطر
بحرین
امارات
کویت

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 pečítajte 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.

ਬੰਦੋਬਸਤੀ ਆਰੰਭ ਕਰਨ ਤੋਂ ਪਹਿਲਾਂ ਸੁਰੱਖਿਆ ਸੂਚੀ ਪੜ੍ਹੋ।
ਸੁਰੱਖਿਆ ਸੂਚੀ ਪੜ੍ਹਨ ਤੋਂ ਪਹਿਲਾਂ ਸੁਰੱਖਿਆ ਸੂਚੀ ਪੜ੍ਹੋ।

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

مەزكۆر مەهسۇلاتنى ئورنىتىشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

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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:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect:

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Statement 2



CAUTION:

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

Do not:

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

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

Statement 12



CAUTION:
The following label indicates a hot surface nearby.



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.

UL regulatory information

This device is for use only with Listed .

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 for information about using light path diagnostics LEDs.
 - **Event logs:** See 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 .
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 .

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 . For more information about the Bootable Media Creator, see .

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 .

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 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 . For information about configuring the blade server, see .
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 .

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 .
8. **Use the troubleshooting tables.** See 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 . 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 . 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 HS12 Type 8014, 8028 or 1916 blade server. It describes the diagnostic tools that come with the blade server, error codes and suggested actions, and instructions for replacing failing components.

Blade server machine type 8014 exclusively supports a SATA interface card which controls the fixed-storage drives. Blade server machine type 8028 and 1916 exclusively supports a SAS interface card which controls hot-swap storage drives.

Note:

Replaceable components are of three types:

- **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 and Support Information* document on the IBM Documentation CD.

Related documentation

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

This *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:

- *Problem Determination and Service Guide*
This 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.
- *Safety Information*
This document is in PDF on the IBM Documentation CD. It contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* document.
- *Warranty and Support Information*
This document is in PDF on the IBM Documentation CD. It contains information about the terms of the warranty and getting service and assistance.

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 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 **Publications lookup**.
4. From the **Product family** menu, select **BladeCenter HS12** and click **Continue**.

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 the removable-media drives. 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.

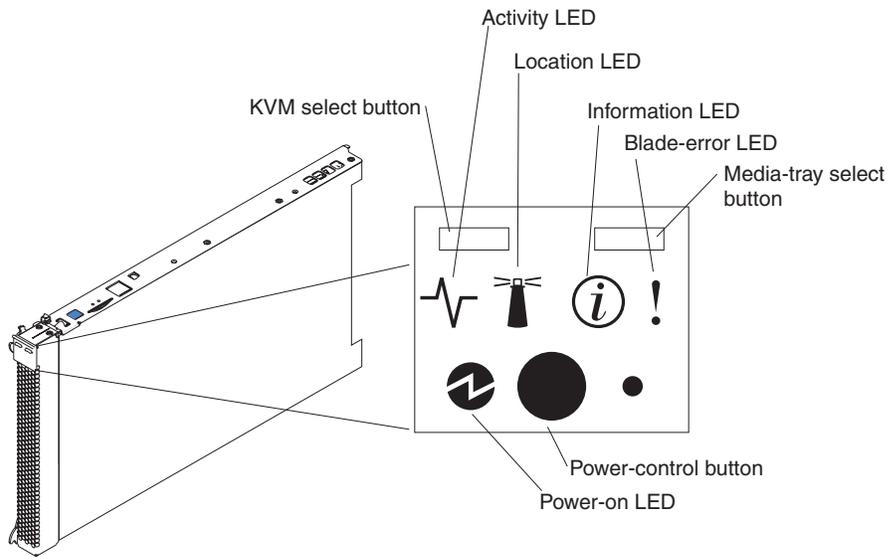
Table 1. Features and specifications

<p>Microprocessor: Supports one Intel LGA-771 microprocessor</p> <p>Note: Use the Configuration/Setup Utility program to determine the type and speed of the microprocessors in the blade server.</p> <p>Memory:</p> <ul style="list-style-type: none"> • Dual-channel, dual inline memory modules (DIMMs): 6 DIMM connectors • Type: ECC double-data rate (DDR2 667) DRAM. Supports 512 MB, 1 GB, 2 GB, and 4 GB DIMMs with up to 24 GB of total memory on the system board <p>Drives: Support for a pair of one of the following storage drives:</p> <ul style="list-style-type: none"> • Hot-swap, small form factor (SFF) Serial Attached SCSI (SAS) hard disk drives, and hot-swap solid state storage drives. • Fixed SFF Serial Advanced Technology Attachment (SATA) hard disk drives • Fixed SFF SATA solid state storage drives 	<p>Predictive Failure Analysis (PFA) alerts:</p> <ul style="list-style-type: none"> • Microprocessor • Memory • Hard disk drives <p>Electrical input: 12 V dc</p> <p>Integrated functions:</p> <ul style="list-style-type: none"> • Expansion card interface • Local service processor: Baseboard management controller (BMC) with Intelligent Platform Management Interface (IPMI) firmware • ATI ES1000 video controller • LSI 1064E SAS controller (type 8028 and 1916) • SATA controller (type 8014) • Concurrent keyboard/video/mouse (cKVM) support when optional cKVM feature card is installed • Light path diagnostics • RS-485 interface for communication with the management module • Automatic server restart (ASR) • USB 2.0 for communication with the cKVM and removable media drives • Serial over LAN (SOL) • Redundant buses for communication with keyboard, mouse, and removable media drives 	<p>Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – 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 89.6°F). Altitude: 914.4 m to 2133.6 m (3000 ft to 7000 ft) – Blade server shipping: -40°C to 60°C (-40°F to 140°F) • Humidity: <ul style="list-style-type: none"> – Blade server on: 8% to 80% – Blade server off: 8% to 80% <p>Size:</p> <ul style="list-style-type: none"> • Height: 24.5 cm (9.7 inches) • Depth: 44.6 cm (17.6 inches) • Width: 2.9 cm (1.14 inches) • Maximum weight: 4.8 kg (10 lb)
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Blade server controls and LEDs

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

Note: The control panel door is shown in the closed position in the following illustration. To access the power-control button, you must open the control panel door.



Keyboard/video/mouse (KVM) select button: Press this button to associate the shared BladeCenter unit keyboard port, video port, and mouse port with the blade server. The LED on this button flashes while the request is being processed and then is lit when the ownership of the keyboard, video, and mouse has been transferred to the blade server. It can take approximately 20 seconds to switch the keyboard, video, and mouse control to the blade server.

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

NumLock NumLock *blade_server_number* Enter

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 management-module Web interface to determine whether local control has been disabled on the blade server. See <http://www-03.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).

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

management-module Web interface at or through IBM® Director Console. For more information about the management-module Web interface, see <http://www-03.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/eserver/v1r2/topic/dirinfo_all/dirinfoparent.html .

Information LED: When this amber LED is lit, it indicates that information about a system error in the blade server has been placed in the management-module event log. The information LED can be turned off through the management-module Web interface at or through IBM® Director Console. For more information about the management-module Web interface, see <http://www-03.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/eserver/v1r2/topic/dirinfo_all/dirinfoparent.html .

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.

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 management-module Web interface to determine whether local control has been disabled on the blade server.

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

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

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

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

- Flashing rapidly: The service processor (BMC) on the blade server is communicating with the management module.
- Flashing slowly: The blade server has power but is not turned on.
- Lit continuously: The blade server has power and is turned on.

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 (behind the control panel door, see “Blade server controls and LEDs” on page 7) 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 management module is initializing, the power-on LED does not flash, and the power-control button on the blade server does not respond.
 2. While the blade server is starting, the power-on LED on the front of the blade server is lit. See “Blade server controls and LEDs” on page 7 for the power-on LED states.
- If a power failure occurs, the BladeCenter unit and then the blade server can start automatically when power is restored, if the blade server is configured through the management module to do so.
 - You can turn on the blade server remotely by using the management module.
 - If the blade server is connected to power (the power-on LED is flashing slowly), the operating system supports the Wake on LAN feature, and the Wake on LAN feature has not been disabled through the management module, the Wake on LAN feature can turn on the blade server.

Turning off the blade server

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 (behind the control panel door; see “Blade server controls and LEDs” on page 7). 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 management-module Web interface. For additional information, see the *IBM BladeCenter Management Module User’s Guide* or go to <http://www-03.ibm.com/systems/management/> for more information.

System-board layouts

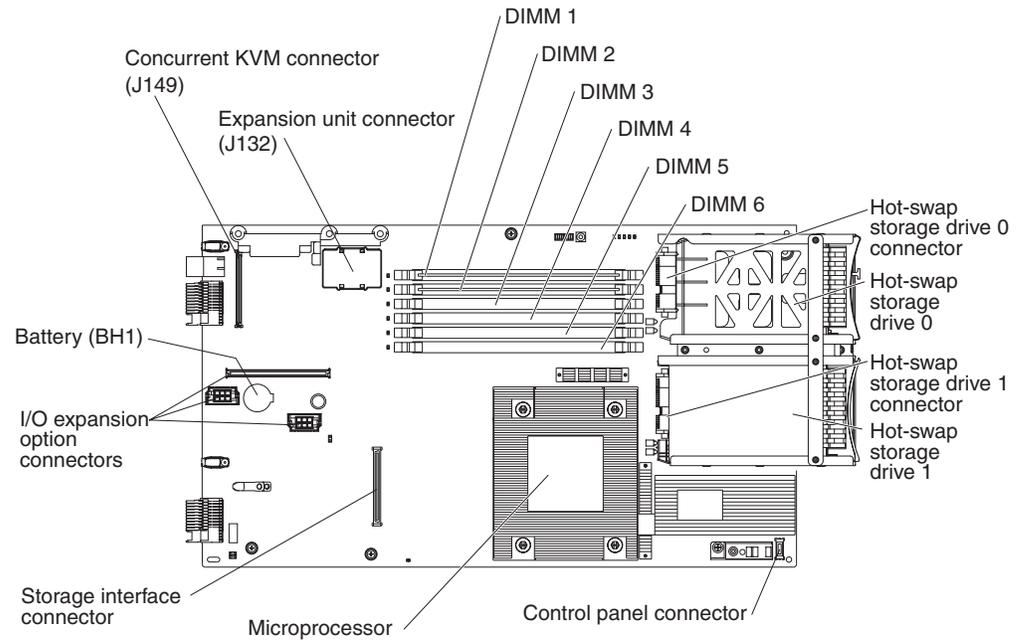
Use this layout to locate connectors, LEDs and switches on the system board of the blade server.

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

System-board connectors

Use this information to locate the component connectors on the system board of the blade server.

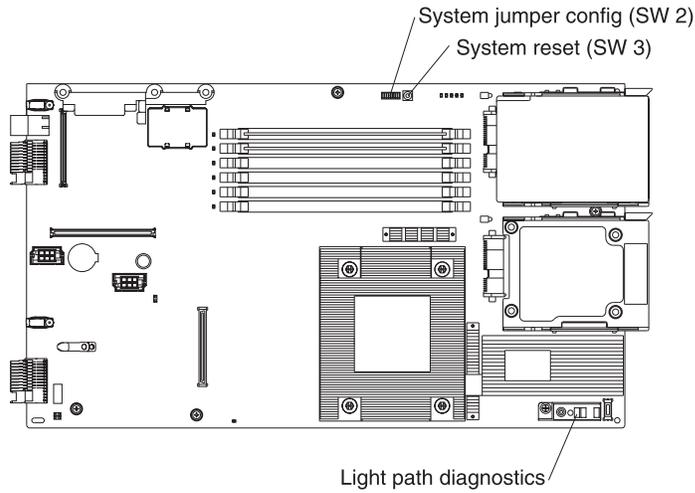
The following illustration shows the connector locations for the hot-swap SAS system board; the connector locations are identical in the fixed SATA system board.



System-board switches

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

The following illustration shows the locations of the two switch blocks (SW2 and SW3) and the light path diagnostics switch on the system board.



The following table describes the function of each switch in the switch blocks (SW2, SW3).

Switch	Description
SW2	<p>Switch block 2 has the following switches:</p> <ul style="list-style-type: none"> • 1 - Boot block • 2 - Force power on • 3 - Wake On LAN disable <ul style="list-style-type: none"> – On: Disabled – Off: Enabled (default) • 4 - Wake On LAN bypass disable <ul style="list-style-type: none"> – On: Disabled – Off: Enabled (default) • 5 - Debug serial port <ul style="list-style-type: none"> – On: Disabled – Off: Enabled (default) • 6 - RCTRST (I/O controller hub (ICH) real-time clock (RTC)) <ul style="list-style-type: none"> – On: Reset RTC – Off: Normal (default) • 7 - Force PCIX 100 <ul style="list-style-type: none"> – On: Force PCIX frequency at 100MHz maximum – Off: PCIX frequency at 133 MHz maximum (default) • 8 - Bypass power-on password during next server start <ul style="list-style-type: none"> – On: Enabled – Off: Disabled (default)
SW3	Switch block 3 is a system-reset switch

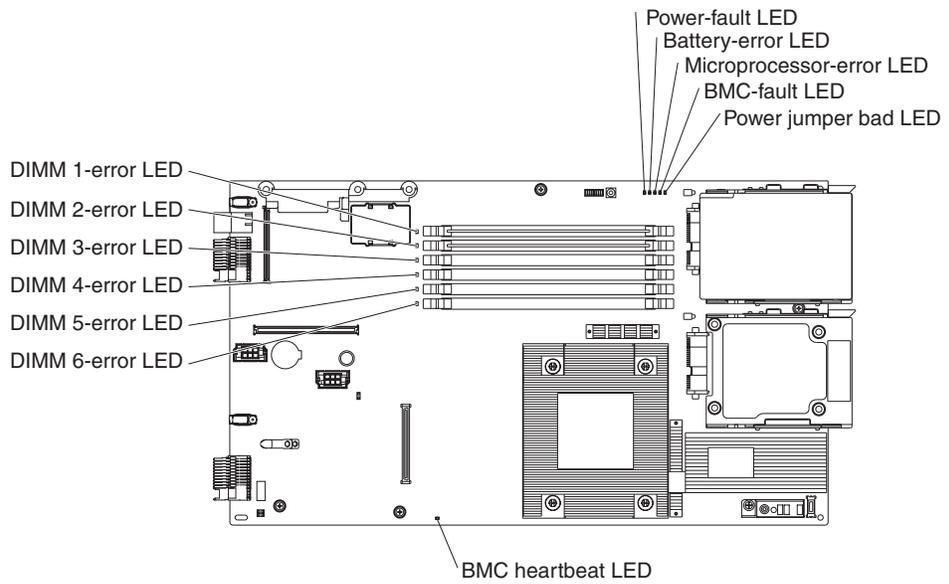
System-board LEDs

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

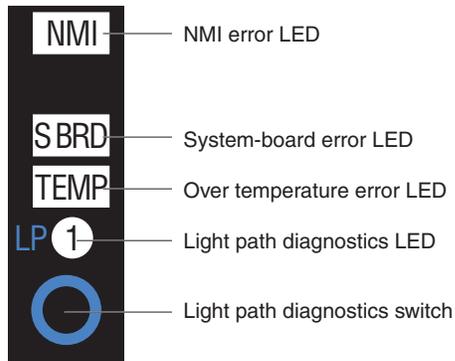
The following illustration shows the LEDs on the system board.

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 12) 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 123.

Note: Some system boards are *not* equipped with the power jumper bad LED.



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.

Before you continue, make sure that the blade server has the latest version of firmware code. For additional information, see “Firmware updates” on page 18.

The following configuration programs come with the blade server:

- **Configuration/Setup Utility program**

The Configuration/Setup Utility program is part of the basic input/output system (BIOS). Use it to change system settings, such as interrupt requests (IRQ), date and time, and password. See *Using the Configuration/Setup Utility program* for more information.

- **LSI Logic Configuration Utility program**

The LSI Logic Configuration Utility program is part of the BIOS. 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 20 for more information.

- **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 using this CD, see “Using the ServerGuide Setup and Installation CD” on page 16.

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

The PXE boot agent utility program is part of the BIOS. 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 18.

The IBM Remote Deployment Manager (RDM) Version 4.20 program is available for purchase. You can use IBM RDM Version 4.20 (or later) to install a BIOS code update onto a blade server by following the instructions in the documentation that comes with the RDM program. To determine whether an operating system supports the RDM program or for updated information about RDM and information about purchasing the software, go to <http://www.ibm.com/systems/management/>.

Using passwords

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

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

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 Configuration/Setup Utility menu.

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

If you forget the power-on password, you can regain access to the blade server either by removing the blade server battery and then reinstalling it or by using the power-on password override switch (see the *Problem Determination and Service Guide* on the *Documentation CD* for instructions).

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.

If a later version of the ServerGuide program is available, you can download a free image of the *ServerGuide Setup and Installation CD*, or purchase the CD from the 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.

Typical operating-system installation

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

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

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.

1. After you have completed the setup process, the operating-system installation program starts. (You will need the 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 the operating-system selection and the installed hard disk drives.
4. The ServerGuide program prompts you to insert the operating-system CD and restart the server. At this point, the installation program for the operating system takes control to complete the installation. The BladeCenter CD drive must be associated with the blade server before you perform this step.

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/systems/support/>.
2. Under **Product support**, click **BladeCenter**.
3. From the menu on the left side of the page, click **BladeCenter support search**.
4. From the **Task** menu, select **Install**.
5. From the **Product family** list, select **BladeCenter HS12**.
6. From the **Operating system** list, select your operating system and click **Search** 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.
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.

If the PXE setup prompt is not displayed, use the Configuration/Setup Utility program to set the **Enable Ethernet PXE/DHCP** option.

3. Use the arrow keys or press Enter to select a choice from the menu.
4. Follow the instructions on the screen to change the settings of the selected items; then, press Enter.

Firmware updates

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

IBM periodically makes BIOS code, service processor (BMC) firmware, and diagnostic firmware updates available for the blade server. 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 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 BIOS code, service processor (BMC) firmware, and diagnostic firmware levels are consistent for all blade servers within the BladeCenter unit.

Configuring the Gigabit Ethernet controller

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

One Ethernet controller is integrated on the blade server system board. A 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 a different I/O module in I/O-module bay 1 or bay 2. The routing from an Ethernet controller to an I/O-module bay varies according to the blade server type and the operating system that is installed.

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, see the *Broadcom NetXtreme Gigabit Ethernet Software* CD that comes with the blade server.

To find updated information about configuring the 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/systems/support/>.
2. Under **Product support**, click **BladeCenter**.
3. Under **Popular links**, click **Publications lookup**.
4. From the **Product family** menu, select **BladeCenter HS12**, and click **Continue**.

Configuring a SAS RAID array

Use this information to configure a SAS RAID array.

Configuring a SAS RAID array applies only to a blade server (machine type 8028) in which two SAS storage drives are installed.

You can use two SAS 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 SAS RAID by using the LSI Configuration Utility program.

If an optional expansion unit is installed, you can use it to control all of the SAS storage drives that are installed in the blade server. Enable this feature by using the **Device and I/O Ports** choice in Configuration/Setup Utility program (see Configuration/Setup Utility menu for information and instructions).

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

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

1. Turn on the blade server (make sure that the blade server is the owner of the keyboard, video, and mouse). See “Turning on the blade server” on page 9.
2. When the message Press Ctrl-C to start LSI Logic Configuration Utility is displayed, press F1. If an administrator password has been set, you must type the administrator password to access the full LSI Logic Configuration Utility menu.
3. Follow the instructions on the screen to modify the SAS storage drive and SAS controller settings.

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 SAS device scan order
- Set the SAS ID for the controller
- Manage the SAS RAID configuration

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

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.

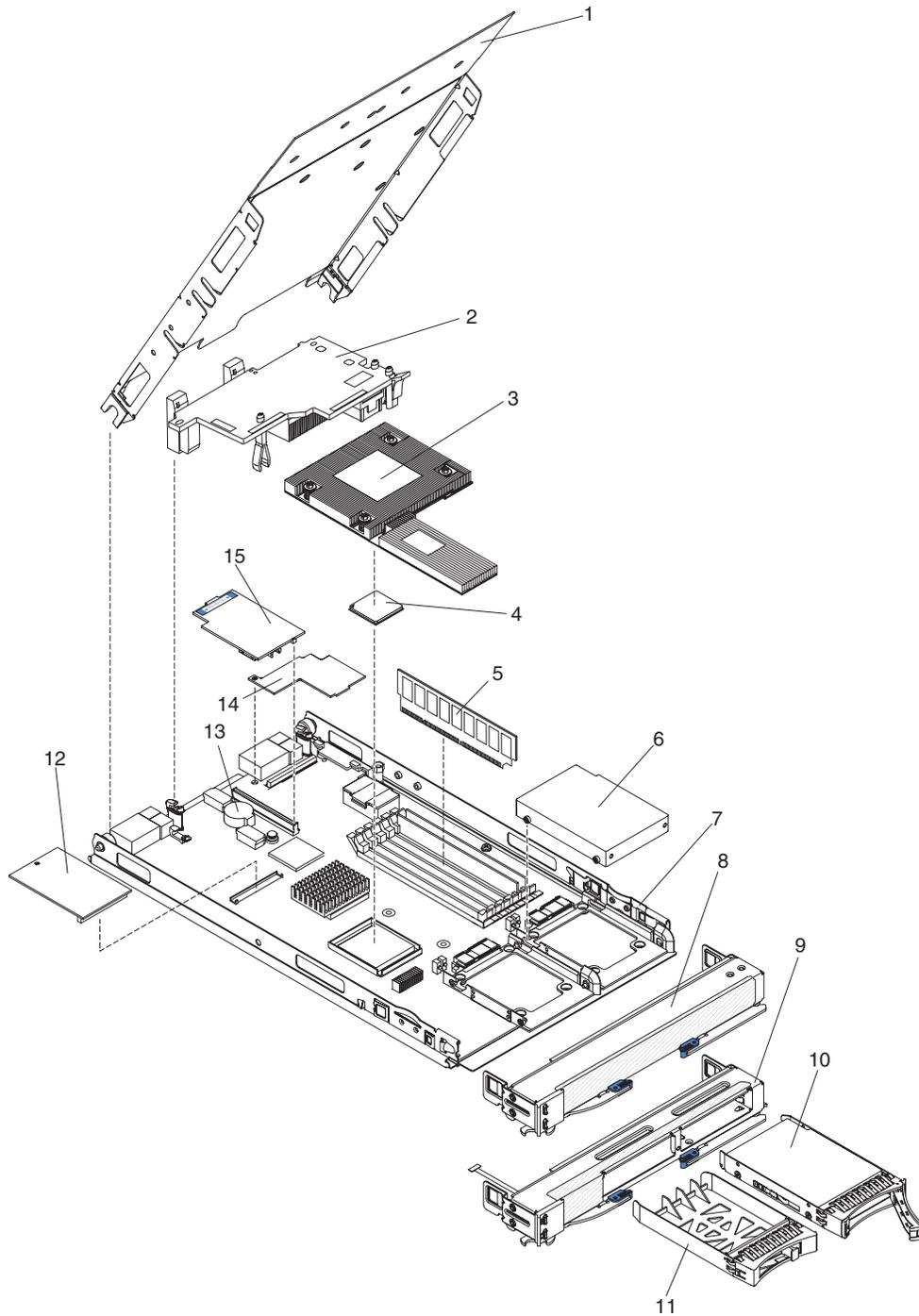
Chapter 4. Parts listing, Types 8014, 8028 and 1916

The following replaceable components are available for the IBM BladeCenter HS12 Type 8014, 8028 or 1916 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 HS12** 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 three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit:** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

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

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
1	Cover (all models)	44R5761		
2	InfiniBand 4x high-speed I/O expansion card (option)	32R1763		
3	Heat sink, microprocessor (all models)			44R5708
4	Microprocessor 1.86 GHz/1066-512KB (fused single-core) (type 8014 model 1Ax, 2Ax)			44R5511
4	Microprocessor 1.86 GHz/1066-2M (dual core) (type 8014 models 2Bx, EBx)			44R5512
4	Microprocessor 2.13 GHz/1066-2M (dual core) (type 8028 models 23x, 33x, E3x)			44R5513
4	Microprocessor 2.50 GHz/1333-6M (quad core) (type 8028 models 44x, 54x)			44R5514
4	Microprocessor 2.50 GHz/1333-12M (quad core) (type 8028 models 4Lx)			46M5500
4	Microprocessor 2.66 GHz/1333-12M (quad core) (type 8028 model 45x)			44R5515
4	Microprocessor 2.83 GHz/1333-12M (quad core) (types 8028 and 1916 models 46x, 56x)			44R5516
4	Microprocessor 3.00 GHz/1333-6M (dual core) (type 8028 27x)			46C7642
5	Memory, 512 MB very low profile (VLP) ECC DDR2 (type 8014 model 1Ax)	39M5860		
5	Memory, 1 GB VLP ECC DDR2 (type 8014 model 2Bx) (type 8028 models 23x, 27x, 44x, 45x, 46x, 4Lx) (type 1916 model 46x)	39M5863		
5	Memory, 1 GB PC2-5300 CL5 ECC DDR2 VLP DIMM (type 8014 model 2Ax) (type 8028 models 33x,54x,56x)	46C0523		
5	Memory, 2 GB VLP ECC DDR2 (type 8014 model EBx) type 8028 model E3x)	46C0518		
5	Memory, 4 GB VLP ECC DDR2 (types 8014 and 8028 option)	46C0519		
6	Hard disk drive, 2.5 inch SATA 80 GB, 7.2 KHz (type 8014 option)	43W7643		
6	Solid state storage drive, 2.5 inch 15.8 GB, 10 KHz, (type 8014 option)	43W7617		
6	Solid state storage drive, 2.5 inch 32 GB, 10 KHz (type 8014 option)	43W7621		
6	Solid state storage drive, 2.5 inch SATA 32 GB, 10KHz (type 8028 option)	43W7651		
7	System-board assembly (all models)			44R5688
8	Front bezel (type 8014 models 1Ax, 2Ax, 2Bx, EBx)	44R5706		
8	Front bezel (OEM)	44R5853		
9	Front bezel with hot-swap open bays (type 8028 models 23x, 27x, 33x, 44x, 45x, 46x, 54x, 56x, E3x) type 1916 models 46x, 4Lx)	44R5705		
10	Hard disk drive, 2.5 inch hot-swap SAS 73 GB, 10 KHz, (type 8028: E3x)	43W7537		

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
10	Hard disk drive, 2.5 inch hot-swap SAS 73 GB, 15 KHz (type 8028 option)	43W7546		
10	Hard disk drive, 2.5 inch hot-swap SAS 146 GB, 10 KHz (type 8028 option)	43W7538		
11	Hot-swap storage-bay filler (type 8028 models 23x, 27x, 33x, 44x, 45x, 46x, 4Lx, 54x, 56x, E3x) (type 1916 models 46x)	44T2248		
12	SAS storage interface card (type 8028 models 23x, 27x, 33x, 44x, 45x, 46x, 4Lx, 54x, 56x, E3x) (type 1916 model 46x)		49Y4457	
12	SATA storage interface card (type 8014 model 1Ax, 2Ax, 2Bx, EBx)		49Y4458	
13	Battery, 3.0 volt (all models)	33F8354		
14	Card, cKVM (option)	13N0842		
15	SAS connectivity card		43W3975	
	Ethernet expansion card, 1 GB 4-port (types 8028 and 8014 optional)	44W4488		
	Bracket, NGB (option)	42C8607		
	2.5 inch hot-swap storage device cage (type 8028 models 23x, 27x, 33x, 44x, 45x, 46x, 54x, 56x, E3x, 4Lx) (type 1916 model 46x)		44R5707	
	Kit, miscellaneous parts (all models)		44R5762	
	Label, system service (type 8014 models 1Ax, 2Ax, 2Bx, EBx)	44R5849		
	Label, FRU list (type 8014 models 1Ax, 2Ax, 2Bx, EBx)	44R5850		
	Label, system service (type 8028 models 23x, 27x, 33x, 44x, 45x, 46x, 4Lx, 54x, 56x, E3x) (type 1916 model 46x)	46C1216		
	Label, FRU list (type 8028 models 23x, 27x, 33x, 44x, 45x, 46x, 4Lx, 54x, 56x, E3x,) Type 1916 model 46x)	46C1217		
	Label, warning (all models)	90P4799		
	PCI I/O expansion unit 3e (types 8014 and 8028 option)	43W4390		
	Tray, storage drive assembly tray with right-side lever release (type 8014 models 1Ax, 2Ax, 2Bx, EBx)		44R5851	
	Recovery CD, English, MS Windows Server 2003 R2, 32-bit edition, 1 - 4 processors			44W4046
	Recovery CD, French, MS Windows Server 2003 R2, 32-bit edition, 1 - 4 processors			44W4047
	Recovery CD, Italian, MS Windows Server 2003 R2, 32-bit edition, 1 - 4 processors			44W4048
	Recovery CD, German, MS Windows Server 2003 R2, 32-bit edition, 1 - 4 processors			44W4049
	Recovery CD, Spanish, MS Windows Server 2003 R2, 32-bit edition, 1 - 4 processors			44W4050
	Recovery CD, Traditional Chinese, MS Windows Server 2003 R2, 32-bit edition, 1 - 4 processors			44W4051
	Recovery CD, Japanese, MS Windows Server 2003 R2, 32-bit edition, 1 - 4 processors			44W4052

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
	Recovery CD, Simplified Chinese, MS Windows Server 2003 R2, 32-bit edition, 1 - 4 processors			44W4053
	Recovery CD, Korean, MS Windows Server 2003 R2, 32-bit edition, 1 - 4 processors			44W4054
	Recovery CD, English, MS Windows Server 2003 R2, 64-bit edition, 1 - 4 processors			44W4055
	Recovery CD, Japanese, MS Windows Server 2003 R2, 64-bit edition, 1 - 4 processors			44W4056
	Recovery CD, English, MS Windows Server 2003 R2, 32-bit edition, 1 - 2 processors			44W4057
	Recovery CD, French, MS Windows Server 2003 R2, 32-bit edition, 1 - 2 processors			44W4058
	Recovery CD, German, MS Windows Server 2003 R2, 32-bit edition, 1 - 2 processors			44W4059
	Recovery CD, Spain, MS Windows Server 2003 R2, 32-bit edition, 1 - 2 processors			44W4060
	Recovery CD, Simplified Chinese, MS Windows Server 2003 R2, 32-bit edition, 1 - 2 processors			44W4061
	Recovery CD, Traditional Chinese, MS Windows Server 2003 R2, 32-bit edition, 1 - 2 processors			44W4062
	Recovery CD, Japanese, MS Windows Server 2003 R2, 32-bit edition, 1 - 2 processors			44W4063
	Recovery CD, Korean, MS Windows Server 2003 R2, 32-bit edition, 1 - 2 processors			44W4064
	Recovery CD, English, MS Windows Server 2003 R2, 32-bit edition, 1 - 8 processors			44W4065
	Recovery CD, French, MS Windows Server 2003 R2, 32-bit edition, 1 - 8 processors			44W4066
	Recovery CD, Italian, MS Windows Server 2003 R2, 32-bit edition, 1 - 8 processors			44W4067
	Recovery CD, German, MS Windows Server 2003 R2, 32-bit edition, 1 - 8 processors			44W4068
	Recovery CD, Spanish, MS Windows Server 2003 R2, 32-bit edition, 1 - 8 processors			44W4069
	Recovery CD, Simplified Chinese, MS Windows Server 2003 R2, 32-bit edition, 1 - 8 processors			44W4070
	Recovery CD, Traditional Chinese, MS Windows Server 2003 R2, 32-bit edition, 1 - 8 processors			44W4071
	Recovery CD, Japanese, MS Windows Server 2003 R2, 32-bit edition, 1 - 8 processors			44W4072
	Recovery CD, Korean, MS Windows Server 2003 R2, 32-bit edition, 1 - 8 processors			44W4073
	Recovery CD, English, MS Windows Server 2003 R2, 64-bit edition, 1 - 2 processors			44W4074
	Recovery CD, Japanese, MS Windows Server 2003 R2, 64-bit edition, 1 - 2 processors			44W4075

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
	Recovery CD, English, MS Windows Server 2003 R2, 64-bit edition, 1 - 8 processors			44W4076
	Recovery CD, Japanese, MS Windows Server 2003 R2, 64-bit edition, 1 - 8 processors			44W4077
	Recovery CD, Italian, MS Windows Server 2003 R2, 32-bit edition, 1 - 2 processors			44W4078
	Recovery CD, Multilingual , MS Windows Server 2008 Standard Edition 32Bit/64Bit, (1 - 4 processors)	46C8235		
	Recovery CD, Multilingual , MS Windows Server 2008 Enterprise Edition 32Bit/64Bit, 1 - 8 processors	46C8236		
	Recovery CD, Simplified Chinese, MS Windows Server 2008 Standard Edition 32Bit/64Bit, 1 - 4 processors	46C8281		
	Recovery CD, Simplified Chinese, MS Windows Server 2008 Enterprise Edition 32Bit/64Bit 1 - 8 processors	46C8282		
	Recovery CD, Traditional Chinese, MS Windows Server 2008 Standard Edition 32Bit/64Bit 1 - 4 processors	46C8283		
	Recovery CD, Traditional Chinese, MS Windows Server 2008 Enterprise Edition 32Bit/64Bit 1 - 8 processors	46C8284		

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:

- **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 8014, 8028 and 1916,” on page 21 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 “Installation guidelines.” 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 HS12** 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
- The blade server battery must be operational. If the battery becomes defective, replace it immediately. For instructions, see the *Problem Determination and Service Guide*.

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

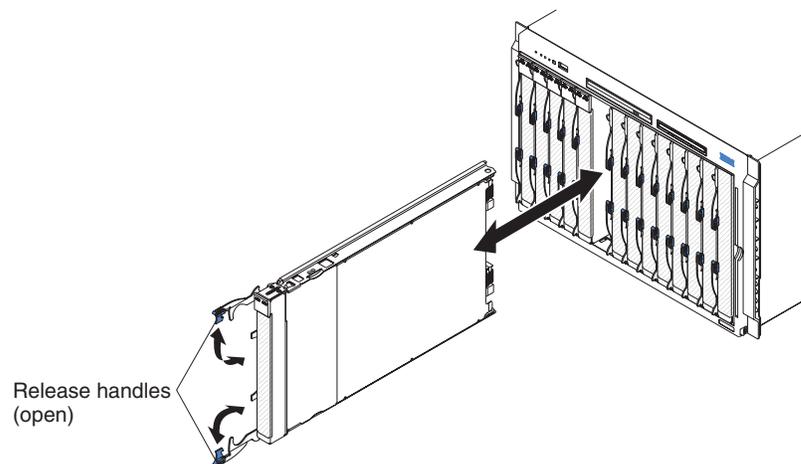
Use this information for instructions to return a device or component to service and support.

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.

If you need an unpopulated I/O-module bay in your BladeCenter unit to install your new blade server, remove an existing blade server or filler module from the BladeCenter unit. The following illustration shows how to remove a blade server or filler module from a 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; then, press the power-control button (behind the blade server control panel door) to turn off the blade server (see “Turning off the blade server” on page 10 for more information).

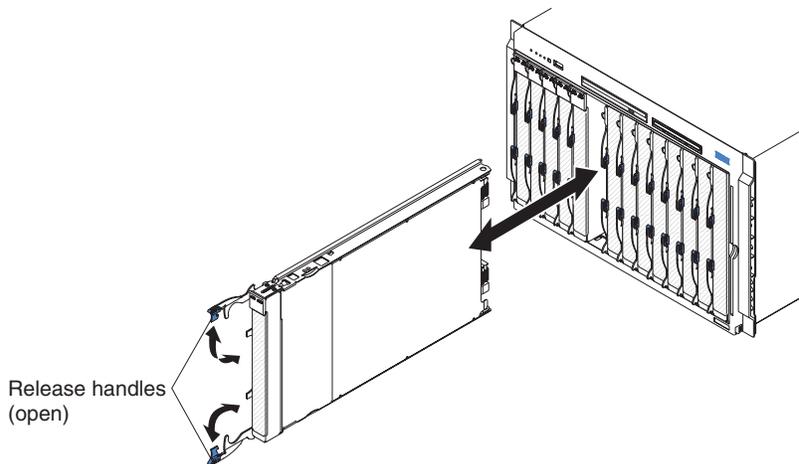
Attention: Wait at least 30 seconds, until the storage devices stop spinning, before you proceed to the next step.

2. 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).
3. Pull the blade server out of the bay.
4. 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 27.
2. If you have not done so already, install any optional devices that you want, such as hard disk drives, memory, or an InfiniBand high-speed expansion card, in the blade server.
3. Select the I/O-module bay for the blade server; at least one I/O-module bay is required.

Notes:

- a. When any blade server or device is in any I/O-module 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. To help ensure proper cooling, performance, and system reliability, make sure that each I/O-module 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 I/O-module bay.
4. Make sure that the release handles on the blade server are in the open position (perpendicular to the blade server).
 5. Slide the blade server into the I/O-module bay until it stops.
 6. Push the release handles on the front of the blade server to the closed position.
 7. Turn on the blade server (see "Turning on the blade server" on page 9 for instructions).
 8. 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.
 9. If you have other blade servers to install, do so now.

If you reinstall a blade server that you removed, you must install it in the same blade server 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 from which it was removed can have unintended consequences, and you might have to reconfigure the blade server.

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

Removing and replacing Tier 1 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.

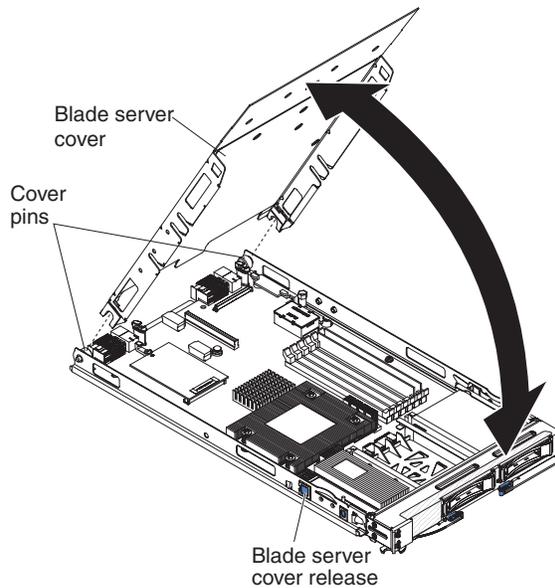
Removing the blade server cover

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

Note:

1. If the blade server has an optional expansion unit in place of the blade server cover, remove it (see "Removing an optional expansion unit" on page 33).
2. The illustrations in this document might differ slightly from your hardware.

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



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 for instructions).
3. Carefully lay the blade server down 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 blade server cover open, as shown in the illustration.
5. Lift the cover from the blade server.
6. If you are instructed to return the cover, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the blade server cover

Use this information to install the cover on the blade server.

Note:

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

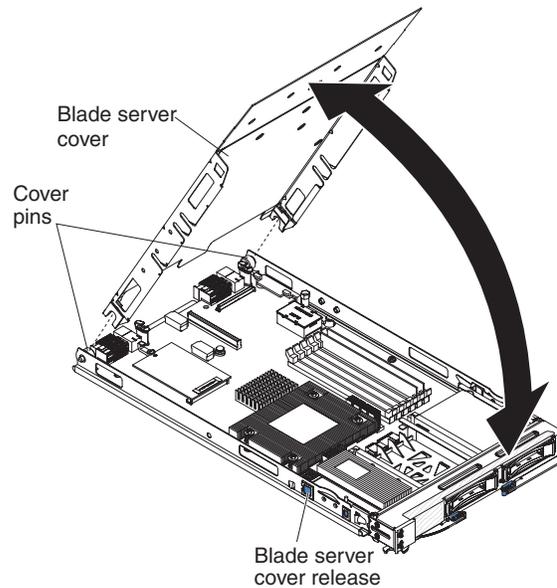
To install the blade server cover, complete the following steps.

Statement 21



CAUTION:

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



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

1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. Lower the cover so that the slots at the rear slide down onto the pins at the rear of the blade server. 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 blade server cover to the closed position until it clicks into place.
4. Install the blade server in the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 30 for instructions).

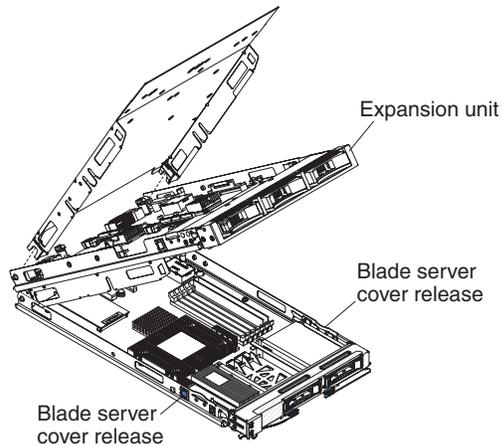
Removing an optional expansion unit

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

To remove the optional expansion unit, complete the following steps.

Note:

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



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 for instructions).
3. Carefully lay the blade server on a flat, static-protective surface, with the cover side up.
4. Open the blade server cover, if one is installed (see “Removing the blade server cover” on page 31 for instructions).
5. Remove the expansion unit:
 - a. Press the blade server cover release on each side of the blade server.
 - b. Use the extraction device on the expansion unit, if one is present, to disengage the expansion unit from the system board. These extraction devices can be of several types, including thumbscrews or levers.
 - c. Rotate the expansion unit open; then, lift the expansion unit from the blade server.
6. If you are instructed to return the cover or an optional 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.

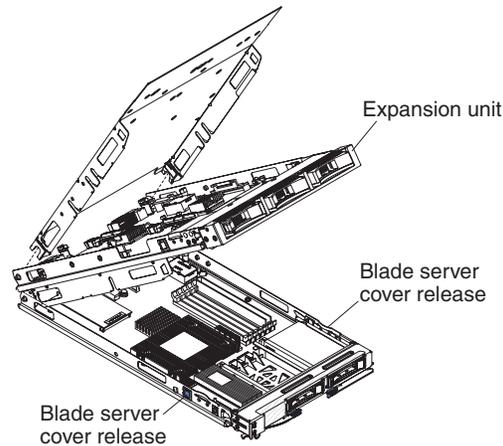
The optional expansion units supported for this blade server are the PCI I/O expansion unit and the Storage and I/O expansion unit.

Attention: If a high-speed 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. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 for instructions).
3. Remove the protective covers from the blade server expansion connectors, if any are present.
4. 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.
5. Orient the optional expansion unit as shown in the illustration.
6. Lower the optional expansion unit so that the slots at the rear slide down onto the cover pins at the rear of the blade server.
7. Close the optional expansion unit (see the expansion unit documentation for information and instructions):
 - If the optional expansion unit has an extraction device, pivot the expansion unit closed; then, use the extraction device to fully seat the expansion unit on the system board. These extraction devices can be of several types, including thumbscrews or levers.
 - If the optional expansion unit has no extraction device, pivot the expansion unit closed; then, press the expansion unit firmly into place until the blade server cover releases click.

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

Removing the bezel assembly

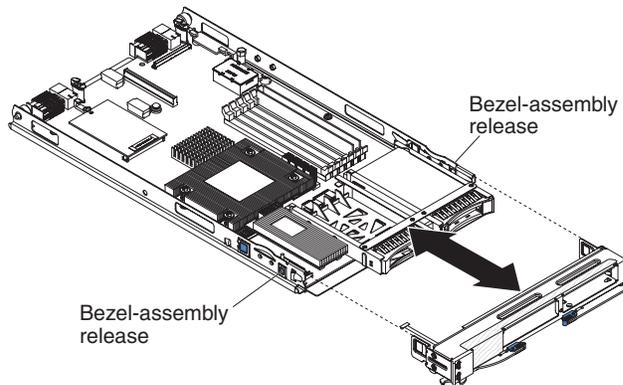
Use this information to remove the bezel assembly from the blade server.

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 27..
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from the BladeCenter unit" on page 29 for instructions).
3. Open the blade server cover (see "Removing the blade server cover" on page 31 for instructions).
4. If an optional expansion unit is installed, remove it (see "Removing an optional expansion unit" on page 33).
5. 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).
6. Disconnect the control panel cable from the control-panel connector.
7. Pull the bezel assembly away from the blade server.
8. 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.

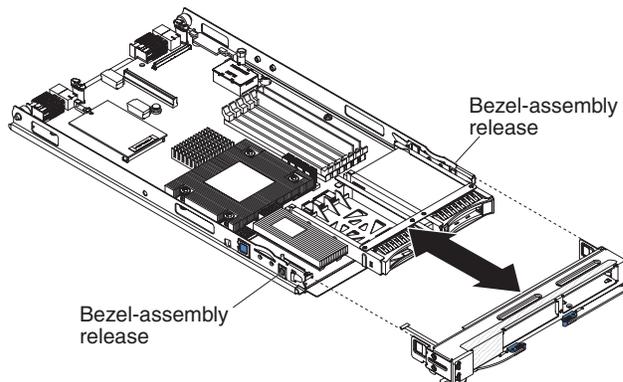
Installing the bezel assembly

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. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 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 31 for instructions).
5. If an optional expansion unit is installed, remove it (see “Removing an optional expansion unit” on page 33).
6. Connect the control-panel cable to the control-panel connector on the system board.
7. Carefully slide the bezel assembly onto the blade server until it clicks into place.
8. Install the expansion unit, if you removed one from the blade server to remove the bezel (see “Installing an optional expansion unit” on page 34).
9. Install the cover onto the blade server (see “Installing the blade server cover” on page 32).
10. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 30).

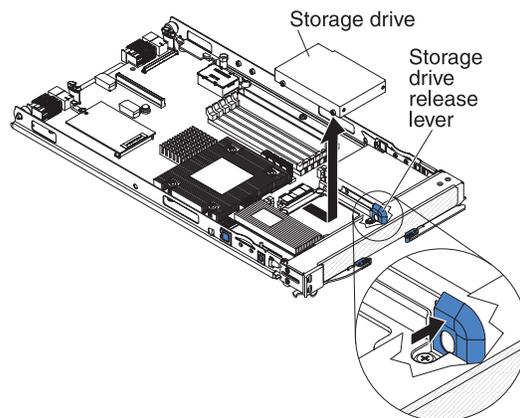
Removing a fixed-storage drive

Use this information to remove a fixed-storage drive from the blade server.

The blade server (machine type model 8014) has two storage bays for fixed-storage devices, such as SATA storage drives. To remove a fixed storage drive, complete the following steps.

Note:

1. The following illustration shows how to remove a fixed-storage device from a blade server.
2. The illustrations in this document might differ slightly from your hardware.



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 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 31 for instructions).
5. If an optional expansion unit is installed, remove it (see “Removing an optional expansion unit” on page 33).
6. Press the storage drive release lever away from the storage drive to open the release lever.
7. From the connector end of the storage drive, push the drive out of the connector and using two fingers lift the storage drive out of the storage tray.
Attention: Do not press on the top of the drive. Pressing on the top might damage the drive.
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 fixed-storage drive

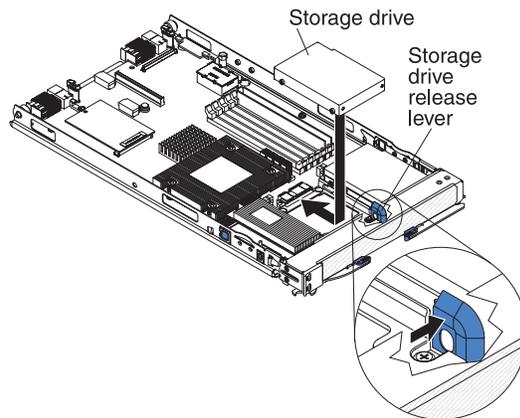
Use this information to install a fixed-storage drive in the blade server.

Depending on which storage devices you have, the blade server (machine type 8014) has two storage bays for installing or removing fixed-storage devices, such as solid state storage drives.

Note:

1. The following illustration shows how to install a fixed-storage device in a blade server.
2. The illustrations in this document might differ slightly from your hardware.

To install a fixed-storage drive, complete the following steps.



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 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 31).
5. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 33).

6. 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 storage drive from the package.
7. Open the release lever on the storage drive and slide the drive into the storage bay until it is firmly seated in the connector.
Attention: Do not press on the top of the drive. Pressing on the top might damage the drive.
8. Lock the storage drive into place by making sure that the storage drive release lever is secure.
9. Install the expansion unit, if you removed one from the blade server to remove the bezel (see “Installing an optional expansion unit” on page 34).
10. Install the cover onto the blade server (see “Installing the blade server cover” on page 32).
11. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 30).

Removing a hot-swap storage drive

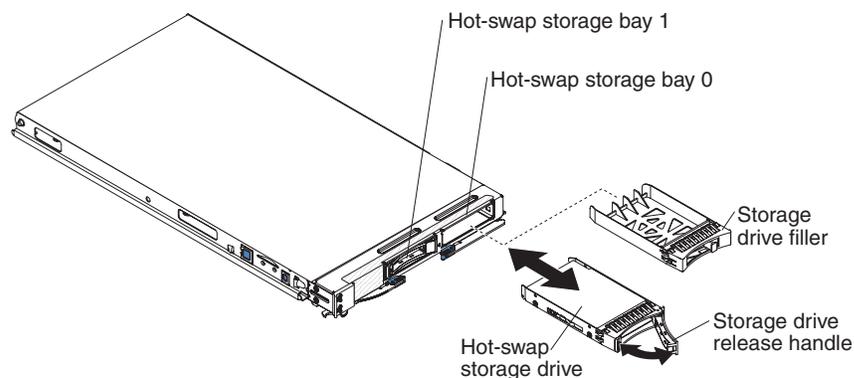
Use this information to remove a hot-swap storage drive.

The blade server (machine type 8028) has two storage bays for installing or removing hot-swap storage devices, such as SAS storage drives.

Note:

1. The following illustration shows how to remove a hot-swap hard disk drive from a blade server.
2. The illustrations in this document might differ slightly from your hardware.

To remove a hot-swap hard disk drive, complete the following steps.



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. Press the arrow on the storage drive release handle to release the hard disk drive and use the release handle to pull the drive away from the storage bay.
3. If you are instructed to return the hard disk drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a hot-swap storage drive

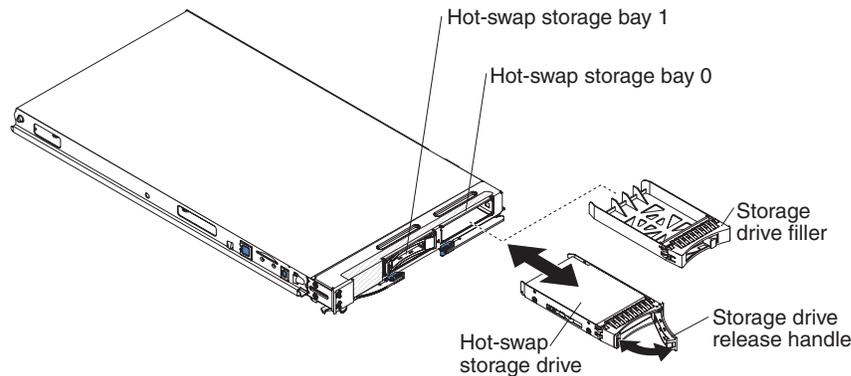
Use this information to install a hot-swap storage drive in the blade server.

To install a hot-swap storage drive, complete the following steps. The blade server (machine type 8028) has two storage bays for installing or removing hot-swap storage devices, such as SAS storage drives.

Note:

1. The following illustration shows how to install a hot-swap storage drive in a blade server.
2. The illustrations in this document might differ slightly from your hardware.

Depending on the blade server model, at least one storage drive might already be installed in storage bay 0. If the blade server is equipped with one storage drive, you can install an additional drive in storage bay 1. These two SAS hard disk drives can be used to implement and manage a redundant array of independent disks (RAID) level-1 array. See “Configuring a SAS RAID array” on page 19 for information about SAS RAID configuration.



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. Identify the hot-swap storage bay (hot-swap storage bay 0 or hot-swap storage bay 1) in which the hard disk drive will be installed.
3. If a storage-drive filler is installed, remove it from the storage bay by lifting the release levers and pulling it away from the blade server.
4. Touch the static-protective package that contains the hard disk drive to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the hard disk drive from the package.
5. Press the arrow on the storage drive release handle to release the hard disk drive and use the release handle to slide the drive into the storage bay until it is firmly seated in the connector.
6. Lock the hard disk drive into place by closing the storage drive release handle.

Removing a memory module

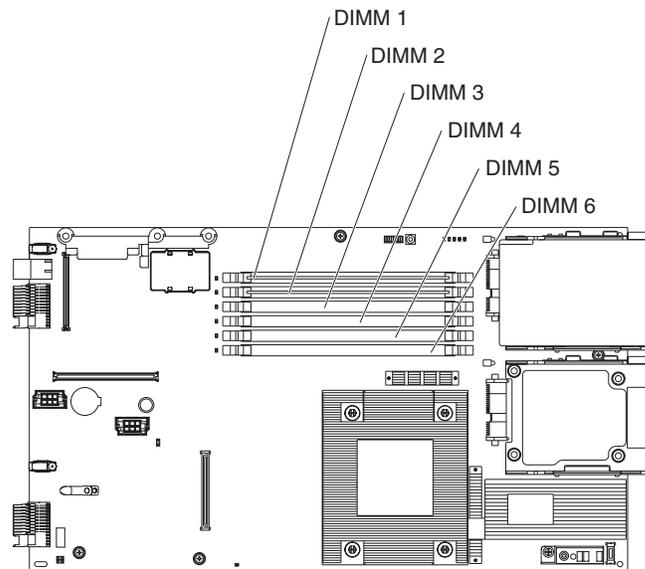
Use this information to a memory module from the blade server.

Note:

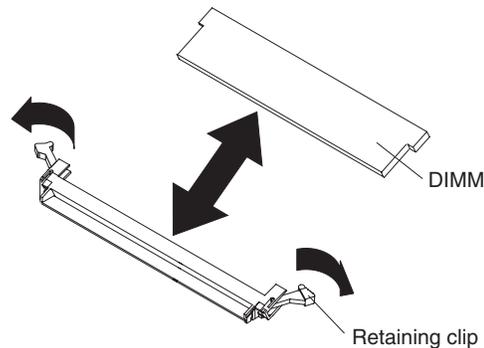
1. The following illustration shows the locations of the DIMM connectors on the system board.

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

To remove a DIMM, complete the following steps.



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29).
3. Remove the blade server cover (see “Removing the blade server cover” on page 31).
4. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 33).



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

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.

5. Using your fingers, pull the DIMM out of the connector.
6. 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 following notes describe the types of direct inline memory modules (DIMMs) that the blade server supports and other information that you must consider when you install DIMMs:

Note:

1. The following illustration shows the location of the DIMM connectors on the system board.
2. The illustrations in this document might differ slightly from your hardware.
 - The system board has DIMM connectors.
 - The server supports two-way memory interleaving.
 - The optional DIMMs that are available for the blade server are 512 MB, 1 GB, 2 GB, and 4 GB. Depending on the memory configuration that is set in the Configuration/Setup Utility program, the blade server can support a minimum of 1 GB and a maximum of 24 GB of system memory on the system board.
 - When you install memory, you must install a pair of matched DIMMs. Some blade server models come with one DIMM installed in DIMM slot 1. In this case, you must order and install a second matched DIMM in DIMM slot 2. Install the DIMMs in the order shown in the following table.

Table 2. DIMM configuration

Pair	DIMM pairs and location
First	DIMM 1 and DIMM 2
Second	DIMM 3 and DIMM 4
Third	DIMM 5 and DIMM 6

Table 3. DIMM Population Rule

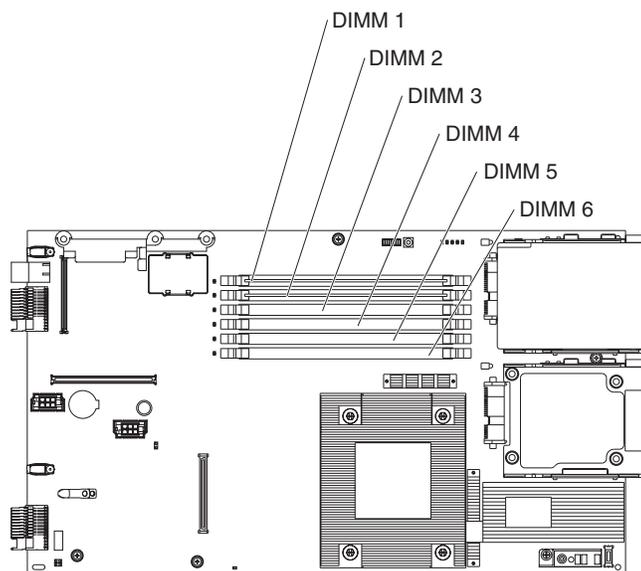
Configuration	DIMM 5 and DIMM 6	DIMM 3 and DIMM 4	DIMM 1 and DIMM 2
1	X	X	Single rank
2	X	Single rank	Single rank
3	Single rank	Single rank	Single rank
4	X	X	Dual rank
5	X	Dual rank	Dual rank
6	Dual rank	Dual rank	Dual rank
7	X	Dual rank	Single rank
8	X	Single rank	Dual rank
9	Dual rank	Single rank	Single rank
10	Dual rank	Dual rank	Single rank

- All DIMMs in a pair or group must be the same size, speed, type, technology, and physical design. You can use compatible DIMMs from different manufacturers.
- Install only ECC DDR2 667 DRAM with ECC DIMMs. For a current list of supported DIMMs for the blade server, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

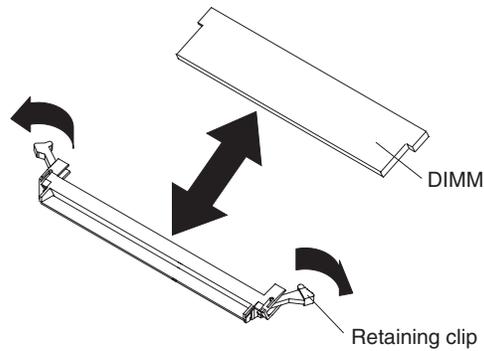
- Installing or removing DIMMs changes the configuration information of the blade server. After you install or remove a DIMM, you must change and save the new configuration information by using the Configuration/Setup Utility program. When you restart the blade server, a message indicates that the memory configuration has changed. Start the Configuration/Setup Utility program and select **Save Settings** (see Configuration/Setup Utility menu for more information) to save changes.

To install a DIMM, complete the following steps:

1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. Read the documentation that comes with the DIMMs.
3. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 for instructions).
4. Carefully lay the blade server on a flat, static-protective surface.
5. Open the blade server cover (see “Removing the blade server cover” on page 31 for instructions).
6. If an expansion unit is installed and you are installing DIMMs on the system board, remove the expansion unit (see “Removing an optional expansion unit” on page 33).
7. Locate the DIMM connectors. Determine the connector into which you will install the DIMM.



8. 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 2 seconds; then, remove the DIMM from its package.
9. To install the DIMMs, repeat the following steps for each DIMM that you install:



- a. Turn the DIMM so that the DIMM keys align correctly with the connector on the system board.
Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.
- b. 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.

Important: If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly installed. In this case, open the retaining clips and remove the DIMM; then, reinsert the DIMM.

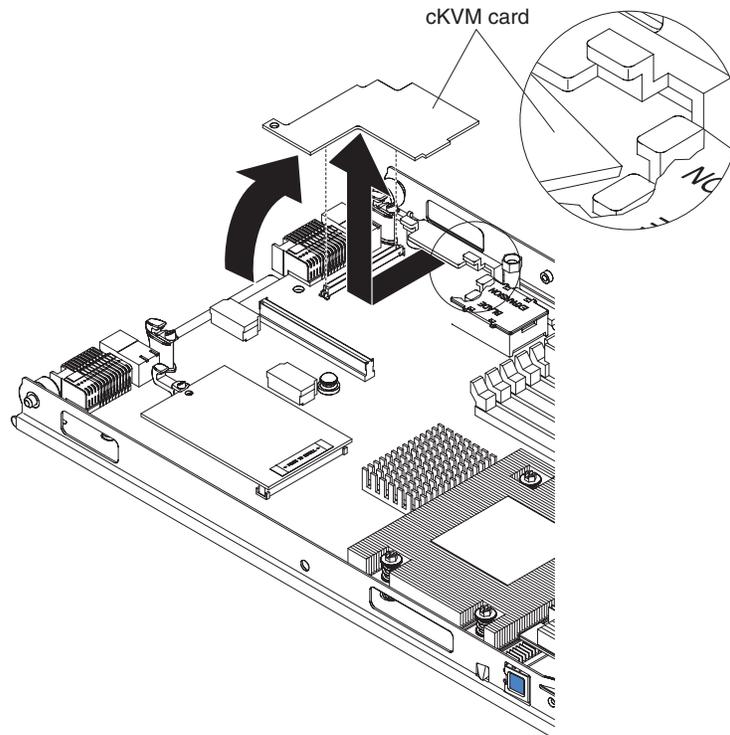
Removing a concurrent KVM card

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

Note:

1. The following illustration shows how to remove the concurrent KVM (cKVM) card from the system board.
2. The illustrations in this document might differ slightly from your hardware.

To remove a cKVM card, complete the following steps.



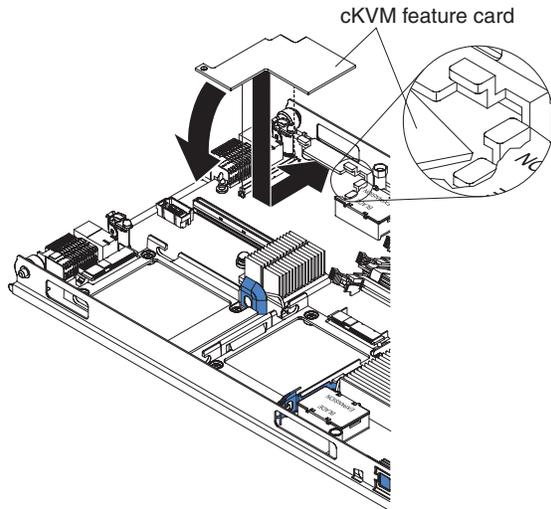
1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29).
3. Remove the blade server cover (see “Removing the blade server cover” on page 31 for instructions).
4. If an optional expansion unit is installed, remove it (see “Removing an optional expansion unit” on page 33).
5. If an I/O expansion card or a high-speed expansion card is installed, remove it (see “Removing an I/O expansion card” on page 46 or “Removing a high-speed expansion card” on page 51).
6. Gently pivot the narrow end of the card out of the cKVM card connectors; then, slide the notched end of the card out of the tabs on the expansion card bracket and lift the card out of the blade server.
7. If you are instructed to return the cKVM card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a concurrent KVM card

To install a cKVM card, complete the following steps.

Note:

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



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29).
3. Remove the blade server cover (see “Removing the blade server cover” on page 31 for instructions).
4. If an optional expansion unit is installed, remove it (see “Removing an optional expansion unit” on page 33).
5. 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 cKVM card from the package.
6. Locate the cKVM connector and orient the cKVM card.
7. Slide the right side of the card (the side of the card that is away from the cKVM connector) between the two tabs at the right side of the expansion card bracket; then, gently pivot the card into the connector.

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

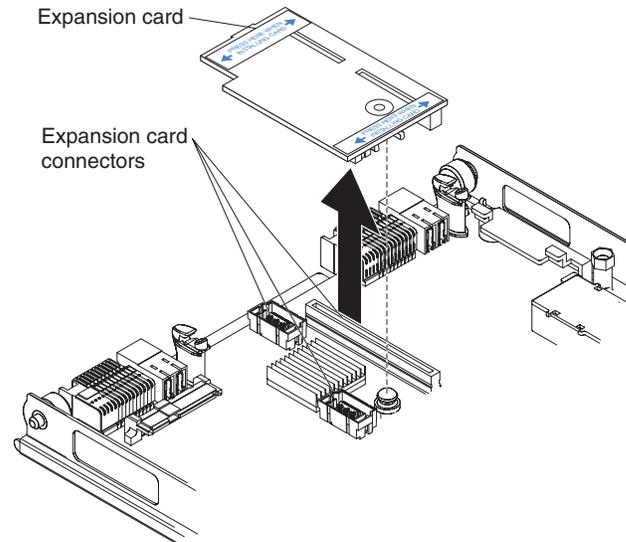
8. Install the optional expansion unit, if you removed one from the blade server when you removed the cKVM card (see “Installing an optional expansion unit” on page 34).
9. If you removed an I/O expansion card, reinstall it (see “Removing an I/O expansion card.”)
10. Install the blade server cover (see “Installing the blade server cover” on page 32).
11. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 30).

Removing an I/O expansion card

Use this information to remove an I/O expansion card from the blade server.

Note:

1. The following illustration shows how to remove an I/O expansion card, such as a SAS connectivity card, from the system board.
 2. The illustrations in this document might differ slightly from your hardware.
- To remove an I/O expansion card, complete the following steps.



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29).
3. Remove the blade server cover (see “Removing the blade server cover” on page 31 for instructions).
4. If an optional expansion unit is installed and you are removing the expansion card from the system board, remove the expansion unit (see “Removing an optional expansion unit” on page 33).
5. Gently pivot the connectivity card out of the expansion card connectors and lift the card out of the blade server.
6. If you are instructed to return the connectivity card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing an I/O expansion card

Use this information to install an I/O expansion card in the blade server.

The illustrations show installing a SAS connectivity card and a high-speed expansion card on the system board; installing the cards in an expansion unit is similar.

The blade server supports various types of I/O expansion cards. See <http://www.ibm.com/servers/eserver/serverproven/compat/us/> for a list of available I/O expansion cards and their form-factor types.

Before you install an I/O expansion card in a blade server, consider the following BladeCenter expansion card, blade server, and other related device information:

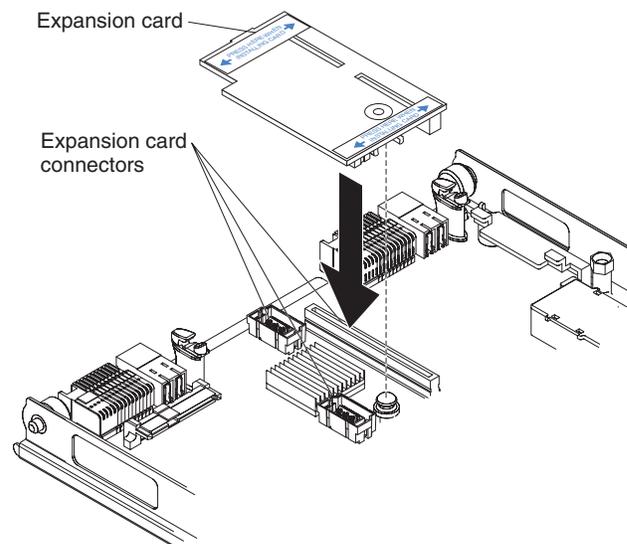
- The appearance of your blade server or system boards might be different from the illustrations in this document.
- Depending on the model of blade server in which the I/O expansion card is being installed, the specific location of connectors and other components might be different from the illustrations in this document or your BladeCenter documentation.

Make sure that the BladeCenter unit and the I/O modules to which the I/O expansion card is mapped supports the network-interface type of the I/O expansion card. For example, if you add an Ethernet expansion card to a blade server in a Type 8677 BladeCenter unit, the I/O modules in I/O-module bays 3 and 4 on the BladeCenter unit must both be compatible with the expansion card. All other expansion cards that are installed in other blade servers in the BladeCenter unit must also be compatible with these I/O modules. In this example, you can then install two Ethernet switch modules, two pass-thru modules, or one Ethernet switch module and one pass-thru module. Because pass-thru modules are compatible with a variety of I/O expansion cards, installing two pass-thru modules enables the use of several types of compatible I/O expansion cards in blade servers within the same BladeCenter unit.

To install the I/O expansion card in a blade server, complete the following steps.

The following illustration shows how to install an I/O expansion card.

To install the I/O expansion card in a blade server, complete the following steps.



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. Turn off the blade server.

3. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 for instructions).
4. Open the blade server cover. (see “Removing the blade server cover” on page 31 for instructions).
5. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 33).
6. If the system board in the blade server contains an expansion card, such as a high-speed expansion card, that is blocking access to the three I/O expansion-card connectors, remove the expansion card that is blocking access to these connectors.
7. If you have not already done so, touch the static-protective package that contains the I/O expansion card to any *unpainted* metal surface of the BladeCenter unit or any *unpainted* metal surface on any other grounded rack-component for at least 2 seconds.
8. Remove the I/O expansion card from its static-protective package.
9. Locate the three I/O expansion-card connectors on the system board in the blade server. Note that two of these card connectors are identical.
10. Align the I/O expansion card over the system board in the blade server, so that the three connectors on the reverse side of the card are correctly aligned above the three matching expansion-card connectors on the system board in the blade server.

ATTENTION: When you apply pressure to both sides of the expansion card to seat it in the blade server in step, press the card gently, so that you do not damage it.

11. To correctly seat the I/O expansion card in the blade server, press down firmly on all four corners of the card. The two labels on the top ends of the card are blue touch points on the I/O expansion card. One of these labels contains the following statement: **PRESS TO INSTALL**. The I/O expansion card is automatically secured to the system board through the retention clip that is located on the reverse side of the card.

Note: The retention clip is permanently attached to the reverse side of the I/O expansion card. Do *not* attempt to remove the retention clip.

12. If you removed an expansion card that was blocking access to the three I/O expansion-card connectors on the blade-server system board, reinstall the expansion card (see “Installing an I/O expansion card” on page 47 for instructions).
13. If you removed an optional expansion unit, reinstall it (see “Installing an optional expansion unit” on page 34).
14. Install the blade server cover (see “Installing the blade server cover” on page 32).
15. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 30. Turn on the blade server, and continue with your BladeCenter system activities.

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

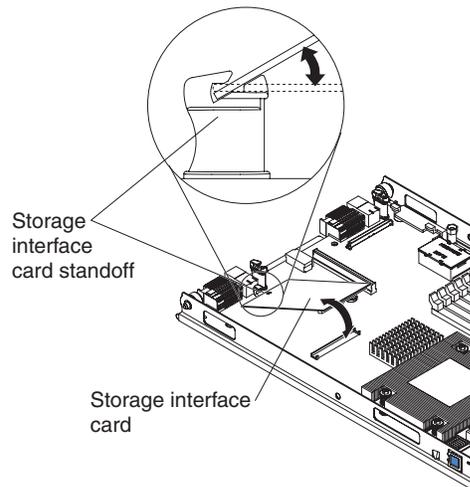
Removing a storage interface card

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

The storage interface card comes in the SAS and SATA controller models. The SAS storage interface card controls the SAS storage drives and the SATA storage interface card controls the SATA and solid state storage drives.

Note:

1. The following illustration shows how to remove a storage interface card from the system board.
2. The illustrations in this document might differ slightly from your hardware.



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

1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 for instructions).
3. Remove the blade server cover (see “Removing the blade server cover” on page 31 for instructions).
4. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 33).
5. Gently lift the card out of the expansion-card connectors; then, slide the notched end of the card out of the raised hook on the storage-interface card standoff and lift the card out of the blade server.
6. If you are instructed to return the storage interface card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a storage interface card

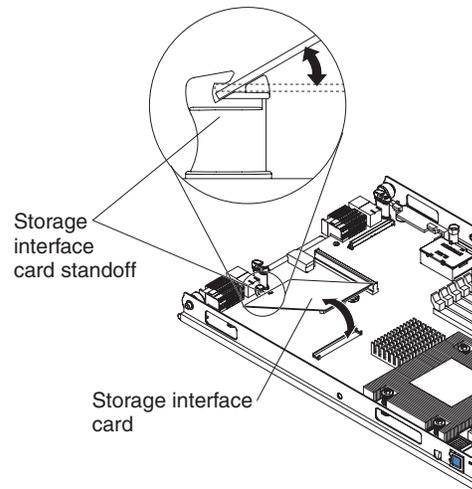
Use this information to install a storage interface card in the blade server.

The storage interface card comes in SAS and SATA controller models. The SAS storage interface card controls the SAS storage drives and the SATA storage interface card controls the SATA and solid state storage drives.

Note:

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

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



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 for instructions).
3. Remove the blade server cover (see “Removing the blade server cover” on page 31 for instructions).
4. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 33).
5. Slide the notched end of the card into the raised hook on the storage-interface card standoff; then, gently orient the card into the storage-interface card connector, and press it firmly into place to fully seat the card on the system board.
6. If you removed an optional expansion unit, reinstall it (see “Installing an optional expansion unit” on page 34).
7. Install the blade server cover (see “Installing the blade server cover” on page 32).
8. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 30. Turn on the blade server, and continue with your BladeCenter system activities.

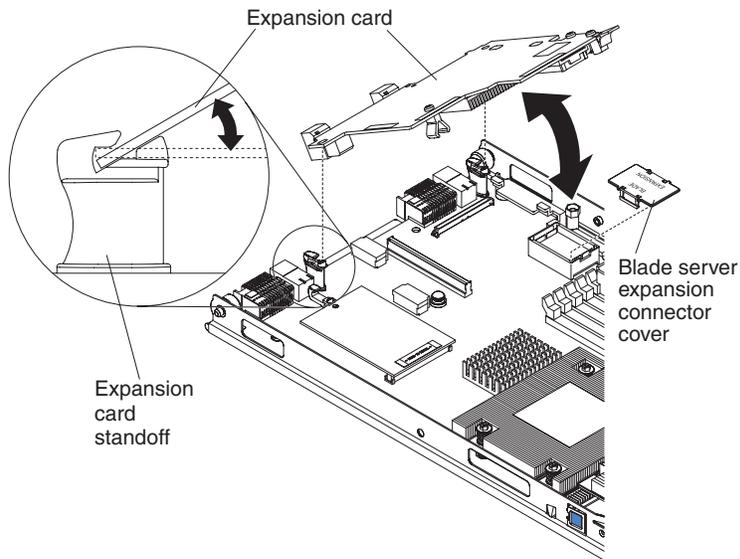
Removing a high-speed expansion card

Use this information to remove a high-speed expansion card.

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

Note:

1. The following illustration shows how to remove a high-speed expansion card, such as an InfiniBand expansion card, from the system board.
2. The illustrations in this document might differ slightly from your hardware.



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 for instructions).
3. Remove the blade server cover (see “Removing the blade server cover” on page 31 for instructions).
4. Rotate the extraction lever upward to disengage the blade server expansion connector.
5. Pivot the narrow end of the card away from the blade server expansion connector; then, slide the slots at the back end of the card out of the expansion-card standoffs and lift the card out of the blade server.
6. If you are instructed to return the expansion card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

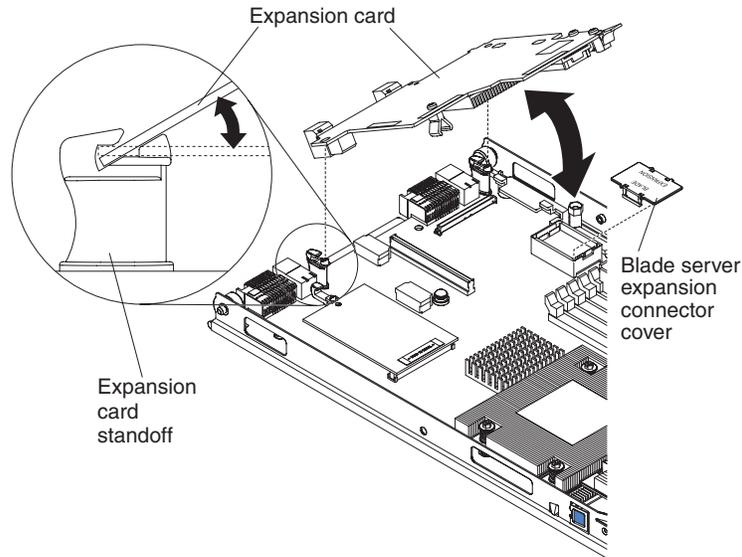
Installing a high-speed expansion card

Use this information to install a high-speed expansion card in the blade server.

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

Notes:

1. The following illustration shows how to install a high-speed expansion card, such as an InfiniBand expansion card, in the system board.
2. The illustrations in this document might differ slightly from your hardware.



1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 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 31 for instructions).
5. Locate the blade server expansion connector and remove the blade server expansion connector cover and set it aside.
6. 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.
7. 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.
8. 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.

9. Install the blade server cover (see “Installing the blade server cover” on page 32).
10. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 30).

Removing the battery

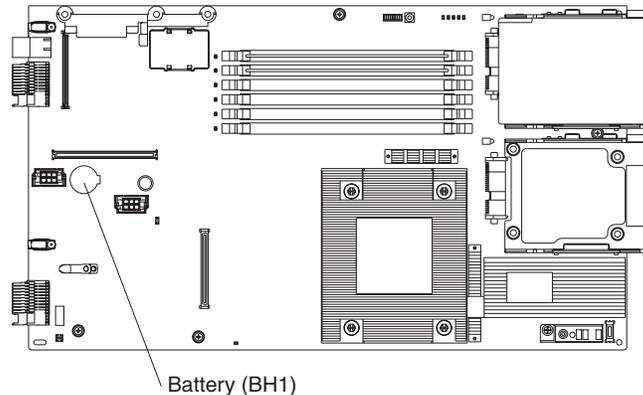
Use this information to the battery from the blade server.

Note:

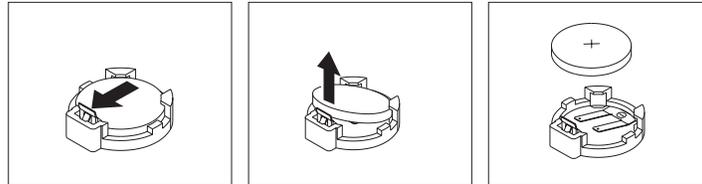
1. The following illustration shows the location and removal of the battery in the system board.
2. The illustrations in this document might differ slightly from your hardware.

To remove the battery, complete the following steps:

1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 for instructions).
3. Remove the blade server cover (see “Removing the blade server cover” on page 31 for instructions).
4. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 33).
5. Locate the battery on the system board.



6. Use one finger to press the top of the battery clip away from the battery. The battery pops up when released.



7. Use your thumb and index finger to lift the battery from the socket.
8. 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

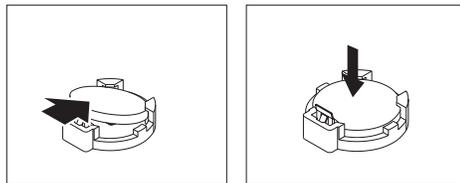
Dispose of the battery as required by local ordinances or regulations.

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 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 for instructions).
3. Remove the blade server cover (see “Removing the blade server cover” on page 31 for instructions).
4. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 33 for instructions).
5. Follow any special handling and installation instructions that come with the battery.
6. Tilt the battery so that you can insert it into the socket.
7. As you slide the battery into place, press the battery down into the socket.



8. 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 34 for instructions).
9. Install the blade server cover (see “Installing the blade server cover” on page 32 for instructions).
10. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 30 for instructions).

11. Turn on the blade server, start the Configuration/Setup Utility program, and reset the configuration (see "Setup and configuration overview" on page 17 for instructions).

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.

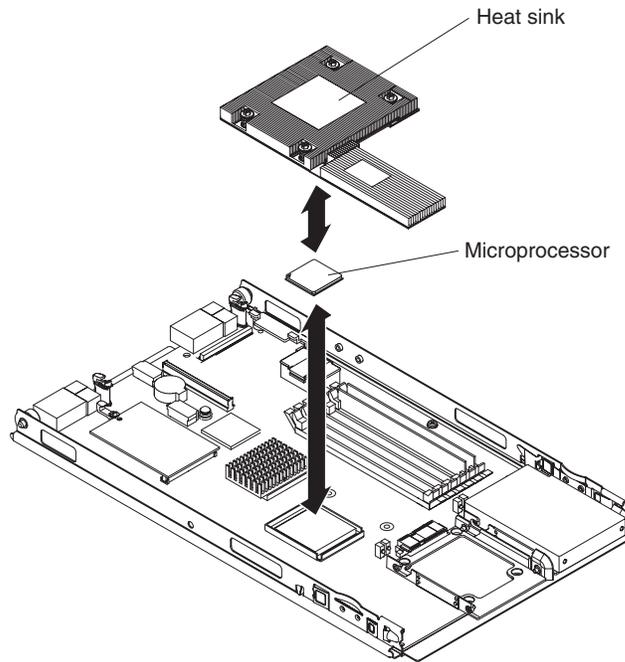
Read the following important guidelines before you remove a microprocessor that is not faulty (for example, when you are replacing the system-board assembly).

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.

Notes:

1. The microprocessor and heat sink 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 173.
2. The heat-sink FRU is packaged with the thermal material applied to the underside. This thermal material is not available as a separate FRU. You must replace the heat sink when new thermal material is required, such as when a defective microprocessor is replaced or if the thermal material is contaminated or has come in contact with another object other than its paired microprocessor.
3. A heat-sink FRU can be ordered separately if the thermal material becomes contaminated.

To remove a microprocessor, complete the following steps.

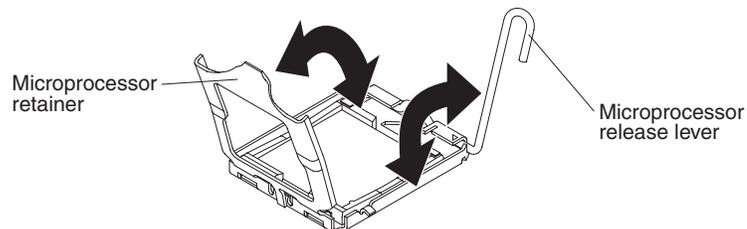


1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 for instructions).
3. Remove the blade server cover (see “Removing the blade server cover” on page 31 for instructions).
4. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 33).
5. 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.

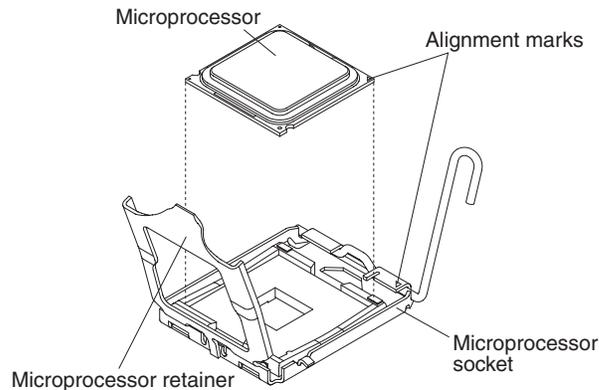
- a. Loosen the screw on one side of the heat sink to break the seal with the microprocessor.
- b. Press firmly on the captive screws and loosen them with a screwdriver.
- c. Use your fingers to gently pull the heat sink from the microprocessor.

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.



- 6.

7. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops in the fully open position (approximately a 135° angle). Lift the microprocessor retainer cover upward.
8. Use your fingers to pull the microprocessor out of the socket.



9. If you are instructed to return the microprocessor and heat sink, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

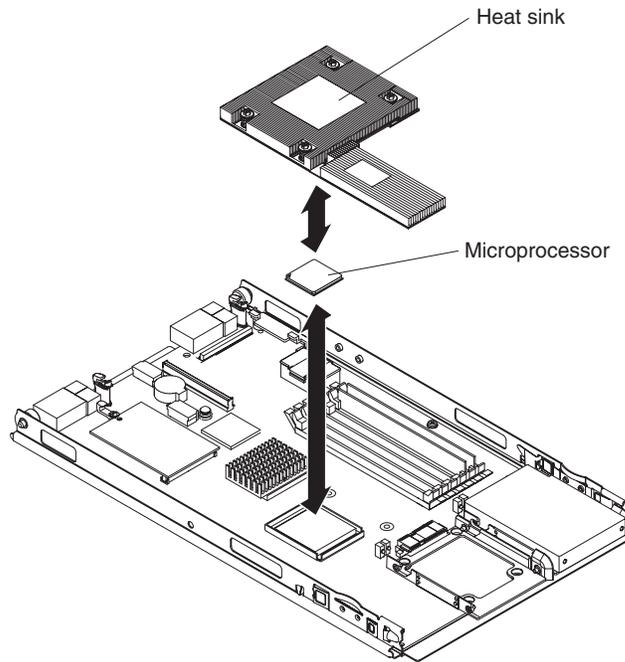
Installing a microprocessor and heat sink

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

Notes:

1. The microprocessor and heat sink 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 173.
2. The heat-sink FRU is packaged with the thermal material applied to the underside. This thermal material is not available as a separate FRU. You must replace the heat sink when new thermal material is required, such as when a defective microprocessor is replaced or if the thermal material is contaminated or has come in contact with another object other than its paired microprocessor.
3. A heat-sink FRU can be ordered separately if the thermal material becomes contaminated.

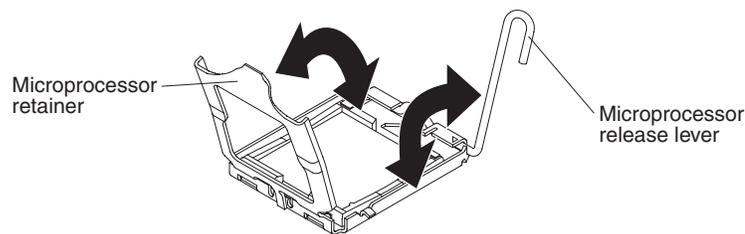
To install a microprocessor and heat sink, complete the following steps.



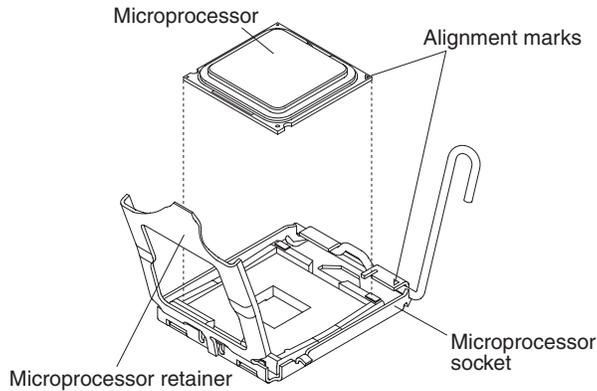
Attention: Do not touch the contacts in the microprocessor socket. Touching these contacts might result in permanent damage to the system board.

1. Install the microprocessor and heat sink.

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



- a. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops in the fully open position (approximately a 135° angle), as shown.
- b. Rotate the microprocessor retainer on the microprocessor socket from its closed position until it stops in the fully open position (approximately a 135° angle), as shown.
- c. Touch the static-protective package that contains the microprocessor to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the microprocessor from the package.
- d. Remove the cover from the bottom of the microprocessor.



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

Attention:

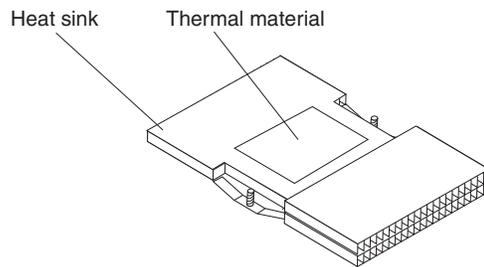
- Do not press the microprocessor into the socket.
- Make sure that the microprocessor is oriented and aligned correctly in the socket before you try to close the microprocessor retainer.

- f. Carefully close the microprocessor retainer.
- g. Rotate the locking lever on the microprocessor socket to the closed and locked position. Make sure that the lever is secured in the locked position by pressing the tab on the microprocessor socket.

2. Install a heat sink on the microprocessor.

Attention:

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



- a. Remove the plastic protective cover from the bottom of the heat sink.
- b. Make sure that the thermal material is still on the bottom of the heat sink; then, align and place the heat sink on top of the microprocessor in the retention bracket, thermal material side down. Press firmly on the heat sink.
- c. Align the two screws on the heat sink with the holes on the heat-sink retention module.
- d. Press firmly on the captive screws and tighten them with a screwdriver, alternating 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 inch-pounds to 9.6 inch-pounds).

3. Install the bezel assembly (see “Installing the bezel assembly” on page 36).
4. Install the optional expansion unit, if you removed one from the blade server to replace the microprocessor and heat sink (see “Installing an optional expansion unit” on page 34).
5. Install the blade server cover (see “Installing the blade server cover” on page 32).
6. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 30).

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 173.

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 10 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 27.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from the BladeCenter unit” on page 29 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 31).
5. If an optional expansion unit is installed, remove the expansion unit (see “Removing an optional expansion unit” on page 33).
6. Remove the blade server bezel assembly (see “Removing the bezel assembly” on page 35).
7. Remove all of the installed components in the following list from the system-board assembly; then, place them on a static-protective surface or install them on the new system-board assembly.
 - cKVM card. See “Removing a concurrent KVM card” on page 44.
 - DIMMs. See “Removing a memory module” on page 40.
 - I/O expansion card. See “Removing an I/O expansion card” on page 46, “Removing a storage interface card” on page 49, and “Removing a high-speed expansion card” on page 51.
 - Microprocessors and heat sinks. See “Removing a microprocessor and heat sink” on page 56.
 - Storage drives. See “Removing a hot-swap storage drive” on page 39 or “Removing a fixed-storage drive” on page 37.
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 173.

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.
 - cKVM card. See "Installing a concurrent KVM card" on page 45.
 - DIMMs. See "Installing a memory module" on page 42.
 - I/O expansion card. See "Installing an I/O expansion card" on page 47, "Installing a storage interface card" on page 50, and "Installing a high-speed expansion card" on page 52.
 - Microprocessors and heat sinks. See "Installing a microprocessor and heat sink" on page 58.
 - Storage drives. See "Installing a fixed-storage drive" on page 38 or "Installing a hot-swap storage drive" on page 40.
2. Install the bezel assembly (see "Installing the bezel assembly" on page 36).
3. Install the optional expansion unit, if you removed one from the blade server to replace the system board (see "Installing an optional expansion unit" on page 34).
4. Install the blade server cover (see "Installing the blade server cover" on page 32).
5. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 30).

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 163 for information about isolating problems with these resources).

If you cannot locate and correct a problem by using the information in this chapter, see “Hardware service and support” on page 173 for more information.

Diagnostics 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:

- **POST beep codes**

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

- One beep indicates successful completion of POST
- Repeating long beeps indicate a memory error. Make sure that all DIMMs are correctly installed. For more information, see “Installing a memory module” on page 42.
- See the *Problem Determination and Service Guide* for more information about beep codes.

- **POST error codes**

See the *Problem Determination and Service Guide* for more information.

-

The POST error codes table in “ServerGuide problems” on page 122 lists problem symptoms and steps to correct the problems.

For more information about POST error problem symptoms and steps to correct the problems, see the *Problem Determination and Service Guide* for your blade server.

- **Troubleshooting tables**

Use the troubleshooting tables to find solutions to problems that have identifiable symptoms. For more information about troubleshooting tables, see the *Problem Determination and Service Guide* for your blade server.

- **Diagnostic programs and error messages**

Real Time Diagnostics 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. Real Time Diagnostics can be plugged into an existing IBM Director environment or installed without IBM Director present. For documentation and download information for Real

Time Diagnostics, see <http://www.ibm.com/systems/management/>. For more information about diagnostic programs and error messages, see the *Problem Determination and Service Guide* for your blade server.

The IBM Dynamic System Analysis (DSA) diagnostic programs are the primary method of testing the major components of the blade server. The diagnostic programs are available in the preboot environment by pressing F2 during the boot process. The Preboot DSA diagnostic programs are stored in integrated USB memory and collect and analyze system information to aid in diagnosing blade server problems. 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 BIOS configuration
- Storage drive health
- Baseboard Management Controller logs

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 the IBM Support Center. Additionally, you can view the blade server 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.

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.

- **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. Blade server error LEDs are described in the *Problem Determination and Service Guide* for your blade server.

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.

1. If a power-on password is set, you must type the password and press Enter, when you are prompted, for POST to run.
2. If POST is completed without detecting any problems, a single beep sounds, and the blade server startup is completed.
3. If POST detects a problem, more than one beep might sound, or an error message is displayed. See “Beep code descriptions” on page 65 and “POST error codes” on page 82 for more information.

POST beep codes

Use this information to diagnose and resolve POST beep code errors.

A beep code is a combination of short or long beeps or a series of short beeps that are separated by pauses. For example, a “1-2-3” beep code is one short beep, a pause, two short beeps, a pause, and three short beeps. A beep code other than one beep indicates that POST has detected a problem. To determine the meaning of a beep code, see “Beep code descriptions.” If no beep code sounds, see “No-beep symptoms” on page 71.

Beep code descriptions

Use this information to determine beep codes and how to resolve the error.

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

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

Exception: If multiple error codes or light path diagnostics LEDs indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 113 for information about diagnosing microprocessor problems.

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 		
Beep code	Description	Action
1-1-2	Microprocessor register test failed.	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat the microprocessor. See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Beep code	Description	Action
1-1-3	CMOS write/read test failed.	<ol style="list-style-type: none"> 1. Reseat the battery. See “Removing the battery” on page 53 and “Installing the battery” on page 54. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
1-1-4	BIOS ROM checksum failed.	<ol style="list-style-type: none"> 1. Update the BIOS code. Go to http://www.ibm.com/systems/support/. 2. Reseat the DIMMs. See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. DIMMs - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
1-2-1	Programmable interval timer failed.	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
1-2-2	DMA initialization failed.	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
1-2-3	DMA page register write/read failed.	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Beep code	Description	Action
1-2-4	RAM refresh verification failed.	<ol style="list-style-type: none"> 1. Reseat the DIMMs and the expansion unit if one is installed. <ul style="list-style-type: none"> • To reseat a DIMM, see “Removing a memory module” on page 40 and “Installing a memory module” on page 42. • To reseat an optional expansion unit, see “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. DIMMs - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62. c. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34.
1-3-1	First 64K RAM test failed.	<ol style="list-style-type: none"> 1. Reseat the DIMMs. See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. 2. Replace the lowest-numbered pair of DIMMs with an identical known good pair of DIMMs; then, restart the blade server. If the beep code remains, go to “Beep code descriptions” on page 65. Return one DIMM at a time from the failed pair to its connector, restarting the blade server after each DIMM, to identify the failed DIMM. 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. DIMMs - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Beep code	Description	Action
1-3-2	First 64K RAM parity test failed.	<ol style="list-style-type: none"> 1. Reseat the DIMMs. See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. DIMMs - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
2-1-1	Secondary DMA register test failed.	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62..
2-1-2	Primary DMA register test failed.	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
2-1-3	Primary interrupt mask register test failed.	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
2-1-4	Secondary interrupt mask register test failed.	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
2-2-2	Keyboard controller test failed.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 163). 2. (Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Beep code	Description	Action
2-3-1	Screen initialization failed.	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
2-4-4	Unsupported memory configuration.	<ol style="list-style-type: none"> 1. Check the DIMM error LEDs on the blade server. See “Light path diagnostics LEDs” on page 126 for more information. 2. Check the management-module event log for DIMM error messages. See “Error logs” on page 72. 3. Replace noncompatible or failing DIMMs in the blade server. See “Removing a memory module” on page 40 and “Installing a memory module” on page 42.
3-1-1	Timer tick interrupt failed.	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
3-1-2	Interval timer channel 2 failed.	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
3-1-4	Time-of-day clock failed.	<ol style="list-style-type: none"> 1. Reseat the battery. See “Removing the battery” on page 53 and “Installing the battery” on page 54. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
3-2-1	Serial port failed.	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Beep code	Description	Action
3-2-2	Parallel port failed	(Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
3-3-2	Critical SMBUS error occurred.	<ol style="list-style-type: none"> 1. Turn-off the blade server (see) and reseal it in the BladeCenter unit. See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. Reseat the DIMMs. See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. DIMMs - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 		
Beep code	Description	Action
3-3-3	No operational memory in system.	<p>Important: In some memory configurations, the 3-3-3 beep code might sound during POST, followed by a blank monitor screen. If this occurs and the Boot Fail Count option in the Start Options of the Configuration/Setup Utility program is enabled, you must restart the blade server three times to reset the configuration settings to the default configuration (the memory connector or band of connectors enabled).</p> <ol style="list-style-type: none"> 1. Install or reseat DIMMS and restart the blade server <i>three times</i>. See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. DIMMs - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.

No-beep symptoms

Use this information to diagnose and resolve no-beep errors.

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

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
No-beep symptom	Action
No beep and the blade server operates correctly	(Trained service technician only) Replace the system-board assembly. For more information, see “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
No beep and no video (system-error LED is off)	See “Solving undetermined problems” on page 167.
No beep and no video (system attention LED is lit)	See “Light path diagnostics” on page 123.

Error logs

Use this information as an example of a BMC error log.

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

The following illustration shows an example of clearing a BMC log entry and viewing the results.

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

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

                Sensor Number= 40
                Event Direction/Type= 01

                Event Data= 52 00 1A
```

Important:

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

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

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

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

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

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

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

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

Viewing the BMC log from the Configuration/Setup Utility program

Use this information to view the BMC log using the Configuration/Setup Utility program.

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

To view the BMC log, complete the following steps:

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

Viewing the BMC log from the diagnostic programs

Use this information to view the BMC log from the diagnostic programs.

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

For information about using the diagnostic programs, see "Dynamic system analysis diagnostic programs and messages" on page 128.

To view the BMC log, complete the following steps:

1. If the blade server is running, turn off the blade server. For more information, see "Turning off the blade server" on page 10.
2. Turn on the blade server. For more information, see "Turning on the blade server" on page 9.
3. When the prompt F2 for Diagnostics is displayed, press F2.
4. From the top of the screen, select **Hardware Info**.
5. From the list, select **BMC Log**.

BMC error messages

Use this information to resolve BMC error messages.

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

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916," on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 	
Error message	Action
I/O board fault	<ol style="list-style-type: none"> 1. Reseat the I/O expansion card. See "Removing an I/O expansion card" on page 46 and "Installing an I/O expansion card" on page 47. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. I/O expansion card - See "Removing an I/O expansion card" on page 46 and "Installing an I/O expansion card" on page 47. b. (Trained service technician only) System-board assembly. - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" on page 62.
cKVM card fault	<ol style="list-style-type: none"> 1. Reseat the cKVM card - See "Removing a concurrent KVM card" on page 44 and "Installing a concurrent KVM card" on page 45. 2. Replace the cKVM card - See "Removing a concurrent KVM card" on page 44 and "Installing a concurrent KVM card" on page 45.

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916," on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 	
Error message	Action
BEM 1 fault	<ol style="list-style-type: none"> 1. Reseat the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. SAS connectivity card - See "Removing a storage interface card" on page 49 and "Installing a storage interface card" on page 50. b. RAID battery - See "Removing the battery" on page 53 and "Installing the battery" on page 54. c. Optional expansion unit - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. 2. Replace the optional expansion unit - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34.
BEM 2 fault	<ol style="list-style-type: none"> 1. Reseat the optional expansion unit - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. 2. Replace the optional expansion unit - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34.
High-speed expansion card fault	<ol style="list-style-type: none"> 1. Reseat the high-speed expansion card - See "Removing an I/O expansion card" on page 46 and "Installing an I/O expansion card" on page 47. 2. Replace the high-speed expansion card - See "Removing an I/O expansion card" on page 46 and "Installing an I/O expansion card" on page 47.

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Error message	Action
Front panel cable is not connected to system board	<ol style="list-style-type: none"> 1. Reseat the control-panel cable - See “Removing the bezel assembly” on page 35. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Bezel assembly - See “Removing the bezel assembly” on page 35 and “Installing the bezel assembly” on page 36. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
BSE RAID battery failure	<ol style="list-style-type: none"> 1. Reseat the battery in the optional expansion unit. See “Removing the battery” on page 53 and “Installing the battery” on page 54. 2. Replace the SAS controller in the optional expansion unit. See “Removing an optional expansion unit” on page 33, “Removing a storage interface card” on page 49 and “Installing a storage interface card” on page 50.
BSE RAID fault	<ol style="list-style-type: none"> 1. Reseat the ServeRAID SAS controller in the optional expansion unit. See “Removing an optional expansion unit” on page 33, “Removing a storage interface card” on page 49 and “Installing a storage interface card” on page 50. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. SAS connectivity card - See “Removing a storage interface card” on page 49 and “Installing a storage interface card” on page 50. b. Optional expansion unit - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34.

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916," on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 	
Error message	Action
Memory module bus fault	<ol style="list-style-type: none"> 1. Reseat the expansion unit - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. 2. Replace the expansion unit system board. See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34.
Firmware (BIOS) halted, System management bus error	<ol style="list-style-type: none"> 1. Update the blade server firmware. To download the latest firmware for the blade server, go to http://www.ibm.com/systems/support/. 2. Update the blade server and optional-device drivers. See "Installation guidelines" on page 27.

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916," on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 	
Error message	Action
PCI bus timeout- system error	<ol style="list-style-type: none"> 1. Remove the blade server from the BladeCenter; then, reinstall it. See "Removing the blade server from the BladeCenter unit" on page 29 and "Installing the blade server in a BladeCenter unit" on page 30. 2. Reseat all the optional devices in the blade server, one at a time, restarting the blade server each time ("Turning off the blade server" on page 10 and "Turning on the blade server" on page 9), to determine where the problem is located. 3. Remove options from the blade server one at a time to determine where the problem is located. <ul style="list-style-type: none"> • Optional expansion unit - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. • I/O expansion card - See "Removing an I/O expansion card" on page 46 and "Installing an I/O expansion card" on page 47. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. All optional devices in the blade server: <ul style="list-style-type: none"> • Optional expansion unit - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. • I/O expansion card - See "Removing an I/O expansion card" on page 46 and "Installing an I/O expansion card" on page 47. b. (Trained service technician only) System-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" on page 62.

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916," on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 	
Error message	Action
Microprocessor halted	<ol style="list-style-type: none"> 1. Remove the blade server from the BladeCenter unit; then, reinstall it. See "Removing the blade server from the BladeCenter unit" on page 29 and "Installing the blade server in a BladeCenter unit" on page 30. 2. Reseat the microprocessor - See "Removing a microprocessor and heat sink" on page 56 and "Installing a microprocessor and heat sink" on page 58. 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor - See "Removing a microprocessor and heat sink" on page 56 and "Installing a microprocessor and heat sink" on page 58. b. (Trained service technician only) System-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" on page 62.
Microprocessor temperature warning	<ol style="list-style-type: none"> 1. Make sure that the blade server is sufficiently cooled. 2. Make sure that the front bezel on the blade server is not blocked. 3. (Trained service technician only) Replace microprocessor - See "Removing a microprocessor and heat sink" on page 56 and "Installing a microprocessor and heat sink" on page 58.
Firmware (BIOS) backup ROM corruption, System board failure	<ol style="list-style-type: none"> 1. Update the blade server firmware - Go to http://www.ibm.com/systems/support/. 2. Replace the optional expansion unit - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34.

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Error message	Action
Planar voltage fault (power 12 V fault)	<ol style="list-style-type: none"> 1. Remove the optional expansion unit from the BladeCenter unit; then, reinstall it. See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
Planar voltage fault (planar fault)	<ol style="list-style-type: none"> 1. Remove the blade server from the BladeCenter unit; then, reinstall it. See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62
Power controller timeout	<ol style="list-style-type: none"> 1. Remove the blade server from the BladeCenter unit; then, reinstall it. See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62
Incompatible power controller firmware	(Trained service technician only) Replace the system-board assembly - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30.
Blade incompatible with chassis	Make sure that the management-module firmware is at the latest level. If the firmware is at latest level, the blade server device is not supported by the BladeCenter unit in which it is installed. Go to http://www.ibm.com/systems/support/ .
Firmware (BIOS) ROM corruption detected	Update the BIOS code - Go to http://www.ibm.com/systems/support/ .

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916," on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 	
Error message	Action
Internal error CPU fault	Make sure that all of the software and the drivers are at the latest levels. Go to http://www.ibm.com/systems/support/ .
CPU over temperature	Make sure that the blade server is sufficiently cooled.
CPU fault	(Trained service technician only) Replace the microprocessor - See "Removing a microprocessor and heat sink" on page 56 and "Installing a microprocessor and heat sink" on page 58.
CPU disabled	(Trained service technician only) Replace the microprocessor - See "Removing a microprocessor and heat sink" on page 56 and "Installing a microprocessor and heat sink" on page 58.
Invalid CPU configuration	Make sure that microprocessor is supported and compatible.
VRD 5d power good fault	<ol style="list-style-type: none"> 1. Remove the blade server from the BladeCenter; then, reinstall it. See "Removing the blade server from the BladeCenter unit" on page 29 and "Installing the blade server in a BladeCenter unit" on page 30. 2. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" on page 62
Hard drive xx removal detected	<p>Replace storage drive xx. Depending on your storage drive type, see one of the following:</p> <ul style="list-style-type: none"> • Fixed-storage drive: "Removing a fixed-storage drive" on page 37 and "Installing a fixed-storage drive" on page 38 • Hot-swap storage drive: "Installing a hot-swap storage drive" on page 40 and "Removing a hot-swap storage drive" on page 39.
Hard drive xx fault	Information only. No action is required.

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.

Error code	Description	Action
<ul style="list-style-type: none"> • 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 8014, 8028 and 1916," on page 21 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. 		
062	Three consecutive startup failures	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program (dw1hb_t_using_the_configuration_setup_utility_program.dita), select Load Default Settings, make sure that the date and time are correct, and save the settings. 2. Reseat the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Battery - See "Removing the battery" on page 53 and "Installing the battery" on page 54. b. (Trained service technician only) Microprocessor - See "Removing a microprocessor and heat sink" on page 56 and "Installing a microprocessor and heat sink" on page 58. 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Battery - See "Removing the battery" on page 53 and "Installing the battery" on page 54. b. (Trained service technician only) Microprocessor - See "Removing a microprocessor and heat sink" on page 56 and "Installing a microprocessor and heat sink" on page 58. c. (Trained service technician only) System-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" on page 62.
101	Timer tick interrupt failure	(Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" on page 62.
102	Timer 2 test failure	(Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" 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 8014, 8028 and 1916,” on page 21 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
106	Diskette controller failure	<ul style="list-style-type: none"> • For blade server type 8028 and 1916, replace the SAS interface card - See “Removing a storage interface card” on page 49 and “Installing a storage interface card” on page 50. • (Trained service technician only) For blade server model 8014, replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
151	Real time clock failure	<ol style="list-style-type: none"> 1. Reseat the battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. 2. Replace the following components one at a time, in the order shown, restarting (and “Turning on the blade server” on page 9) the blade server each time: <ol style="list-style-type: none"> a. Battery - See “Removing the battery” on page 53, and “Installing the battery” on page 54. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
161	Real-time clock battery failure	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program (dw1hb_t_using_the_configuration_setup_utility_program.dita), select Load Default Settings and save the settings. 2. Reseat the battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 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
162	Invalid configuration information or CMOS RAM checksum failure.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program (dw1hb_t_using_the_configuration_setup_utility_program.dita), select Load Default Settings and save the settings. 2. Reseat the battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
163	Time of day not set.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program (dw1hb_t_using_the_configuration_setup_utility_program.dita), select Load Default Settings, and make sure that the date and time are correct, and save the settings. 2. Reseat the battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 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
184	Bad power-on password.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program (dw1hb_t_using_the_configuration_setup_utility_program.dita), select Load Default Settings and save the settings. 2. Reseat the battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
188	Bad EEPROM CRC #2	(Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
189	Three attempts to enter the incorrect password.	Restart the blade server, run the Configuration/Setup Utility program (dw1hb_t_using_the_configuration_setup_utility_program.dita), and change the power-on password (“Using passwords” 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 8014, 8028 and 1916,” on page 21 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
289	Memory error	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program (dw1hb_t_using_the_configuration_setup_utility_program.dita), disable the problem DIMMs under select Advanced Setup → Memory Settings, and save the settings. 2. If an expansion unit is installed, reseal it. See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 3. Replace the following components one at a time, in the order shown, restarting the blade server each time. <ol style="list-style-type: none"> a. DIMMs - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62. c. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34.
301	Keyboard failure.	<ol style="list-style-type: none"> 1. If you have installed a USB keyboard, run the Configuration/Setup Utility program (dw1hb_t_using_the_configuration_setup_utility_program.dita), and enable the keyboardless operation to prevent the POST error message 301 from being displayed during startup. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
602	Invalid diskette boot record.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 2. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916," on page 21 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
604	Diskette drive failure.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources. See "Solving shared BladeCenter resource problems" on page 163. 2. (Trained service technician only) Replace the system-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" on page 62.
1200	Processor machine check.	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat the microprocessor - See "Removing a microprocessor and heat sink" on page 56 and "Installing a microprocessor and heat sink" on page 58. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor. - See "Removing a microprocessor and heat sink" on page 56 and "Installing a microprocessor and heat sink" on page 58. b. (Trained service technician only) System-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" 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 8014, 8028 and 1916,” on page 21 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
1762	Hard disk drive configuration has changed.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program, make sure that the hard disk drive configuration is correct, and save the settings. See <code>dw1hb_t_using_the_configuration_setup_utility_program.dita</code>. 2. Reseat the storage drives. Depending on your storage drive configuration, use the following information to reseat your storage drives: <ul style="list-style-type: none"> • Fixed-storage drive - See “Removing a fixed-storage drive” on page 37 and “Installing a fixed-storage drive” on page 38. • Hot-swap storage drive - See “Removing a hot-swap storage drive” on page 39 and “Installing a hot-swap storage drive” on page 40. 3. If an optional expansion unit is installed, reseat it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Storage drives: <ul style="list-style-type: none"> • Fixed-storage drive - See “Removing a fixed-storage drive” on page 37 and “Installing a fixed-storage drive” on page 38. • Hot-swap storage drive - See “Removing a hot-swap storage drive” on page 39 and “Installing a hot-swap storage drive” on page 40. b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916," on page 21 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
1800	No more IRQs available.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and make sure that interrupt resource settings are correct. See <code>dw1hb_t_using_the_configuration_setup_utility_program.dita</code>. 2. Remove each I/O expansion card one at a time, restarting the blade server each time, until the problem is isolated - See "Turning off the blade server" on page 10 "Removing an I/O expansion card" on page 46 and "Turning on the blade server" on page 9. 3. If an optional expansion unit is installed, reseal it - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Failed I/O expansion card - See "Removing an I/O expansion card" on page 46 and "Installing an I/O expansion card" on page 47. b. Optional expansion unit (if one is installed) - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. c. (Trained service technician only) System-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" 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 8014, 8028 and 1916,” on page 21 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
1801	No more room for option ROM.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and make sure that the PXE settings are correct. Disabling PXE can allow more optional devices to be managed. See <code>dw1hb_t_using_the_configuration_setup_utility_program.dita</code>. 2. Use the Configuration/Setup Utility program (Advanced Setup → PCI Bus Control → PCI ROM Control) to disable each optional device one at a time, restarting the blade server each time, until the 1801 error code is cleared. Optional devices that cause the 1801 error code are the I/O expansion cards and expansion units. Disable these optional devices in the order of least-to-most important. 3. Remove each optional device one at a time, restarting the blade server each time, until the 1801 error code is cleared. Optional devices that cause the 1801 error code are the I/O expansion cards and optional expansion unit. Remove these optional devices in the order of least-to-most important. See the following optional device procedures: <ul style="list-style-type: none"> • I/O expansion card - See “Removing an I/O expansion card” on page 46 and “Installing an I/O expansion card” on page 47. • Optional expansion unit - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 4. (Trained service technician only) If the problem remains after all optional devices have been removed, replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 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
1802	No more I/O space available.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and make sure that interrupt resource settings are correct. See <code>dw1hb_t_using_the_configuration_setup_utility_program.dita</code>. 2. Remove each I/O expansion card one at a time, restarting the blade server each time, until the problem is isolated. See the following optional device procedures: <ul style="list-style-type: none"> • I/O expansion card - See “Turning off the blade server” on page 10 “Removing an I/O expansion card” on page 46 and “Turning on the blade server” on page 9. • Optional expansion unit - See “Removing an optional expansion unit” on page 33. 3. If an optional expansion unit is installed, reseal it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Failed I/O expansion card - See “Removing an I/O expansion card” on page 46 and “Installing an I/O expansion card” on page 47. b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916," on page 21 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
1803	No more memory (above 1 MB) available.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and make sure that interrupt resource settings are correct. See <code>dw1hb_t_using_the_configuration_setup_utility_program.dita</code>. 2. Remove each I/O expansion card one at a time, restarting the blade server each time, until the problem is isolated - See "Turning off the blade server" on page 10 "Removing an I/O expansion card" on page 46 and "Turning on the blade server" on page 9. 3. If an optional expansion unit is installed, reseal it - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Failed I/O expansion card - See "Removing an I/O expansion card" on page 46 and "Installing an I/O expansion card" on page 47. b. Optional expansion unit (if one is installed) - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. c. (Trained service technician only) System-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" 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 8014, 8028 and 1916," on page 21 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
1804	No more memory (below 1 MB) available.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and make sure that interrupt resource settings are correct. See <code>dw1hb_t_using_the_configuration_setup_utility_program.dita</code>. 2. Remove each I/O expansion card one at a time, restarting the blade server each time, until the problem is isolated. See "Turning off the blade server" on page 10 "Removing an I/O expansion card" on page 46 and "Turning on the blade server" on page 9. 3. If an optional expansion unit is installed, reseal it - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Failed I/O expansion card - See "Removing an I/O expansion card" on page 46 and "Installing an I/O expansion card" on page 47. b. Optional expansion unit (if one is installed) - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. c. (Trained service technician only) System-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" 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 8014, 8028 and 1916," on page 21 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
1805	Checksum error or 0 size option ROM.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and make sure that interrupt resource settings are correct. See <code>dw1hb_t_using_the_configuration_setup_utility_program.dita</code>. 2. Remove each I/O expansion card one at a time, restarting the blade server each time, until the problem is isolated. See "Turning off the blade server" on page 10 "Removing an I/O expansion card" on page 46 and "Turning on the blade server" on page 9. 3. If an optional expansion unit is installed, reseal it - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Failed I/O expansion card - See "Removing an I/O expansion card" on page 46 and "Installing an I/O expansion card" on page 47. b. Optional expansion unit (if one is installed) - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. c. (Trained service technician only) System-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" 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 8014, 8028 and 1916,” on page 21 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
1806	PCI device failed BIST.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program) and make sure that interrupt resource settings are correct. See <code>dw1hb_t_using_the_configuration_setup_utility_program.dita</code>. 2. Remove each I/O expansion card one at a time, restarting the blade server each time, until the problem is isolated. See “Turning off the blade server” on page 10 “Removing an I/O expansion card” on page 46 and “Turning on the blade server” on page 9. 3. If an optional expansion unit is installed, reseal it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Failed I/O expansion card - See “Removing an I/O expansion card” on page 46 and “Installing an I/O expansion card” on page 47. b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916," on page 21 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
1807	System board device did not respond or was disabled by the user.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program and make sure that interrupt resource settings are correct. See <code>dw1hb_t_using_the_configuration_setup_utility_program.dita</code>. 2. Remove each I/O expansion card one at a time, restarting the blade server each time, until the problem is isolated. See "Turning off the blade server" on page 10 "Removing an I/O expansion card" on page 46 and "Turning on the blade server" on page 9. 3. If an optional expansion unit is installed, reseal it - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Failed I/O expansion card - See "Removing an I/O expansion card" on page 46 and "Installing an I/O expansion card" on page 47. b. Optional expansion unit (if one is installed) - See "Removing an optional expansion unit" on page 33 and "Installing an optional expansion unit" on page 34. c. (Trained service technician only) System-board assembly - See "Removing the system-board assembly" on page 61 and "Installing the system-board assembly" 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 8014, 8028 and 1916,” on page 21 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
1808	Invalid header.	<ol style="list-style-type: none"> 1. Run the Configuration/Setup Utility program (“Setup and configuration overview” on page 17) and make sure that interrupt resource settings are correct. 2. Remove each I/O expansion card one at a time, restarting the blade server each time, until the problem is isolated. See “Turning off the blade server” on page 10 “Removing an I/O expansion card” on page 46 and “Turning on the blade server” on page 9. 3. If an optional expansion unit is installed, reseal it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Failed I/O expansion card - See “Removing an I/O expansion card” on page 46 and “Installing an I/O expansion card” on page 47. b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 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
1962	Boot sector error, no operating system installed.	<ol style="list-style-type: none"> 1. Make sure that a bootable operating system is installed. See the <i>Installation and User's Guide</i>. 2. Run the SAS Attached Disk diagnostic test - See “Dynamic system analysis diagnostic programs and messages” on page 128. 3. Reseat the storage drive. Depending on your storage drive configuration, use the following information to reseat your storage drives: <ul style="list-style-type: none"> • Fixed-storage drive - See “Removing a fixed-storage drive” on page 37 and “Installing a fixed-storage drive” on page 38. • Hot-swap storage drive - See “Removing a hot-swap storage drive” on page 39 and “Installing a hot-swap storage drive” on page 40. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Storage drive - Depending on your storage-drive configuration, replace one of the following: <ul style="list-style-type: none"> • Fixed-storage drive - See “Removing a fixed-storage drive” on page 37 and “Installing a fixed-storage drive” on page 38. • Hot-swap storage drive - See “Removing a hot-swap storage drive” on page 39 and “Installing a hot-swap storage drive” on page 40. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 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
00012000	Processor machine check	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat the microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
000197	Processor P failed BIST	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat the microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. 2. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
00150100	Multi-bit error occurred: forcing NMI DIMM=xx DIMM=yy (could not isolate)	<ol style="list-style-type: none"> 1. Reseat following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. DIMMs xx and yy - . b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. DIMMs xx and yy - b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
00150200	SERR: Addr or Spec. Cyc. DPE Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	<ol style="list-style-type: none"> 1. If an optional expansion unit is installed, reseat it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. Reseat the I/O expansion card in slot xx; then, restart the blade server. 3. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. I/O expansion card in slot xx - b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 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
00150300	SERR: Received Target Abort Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	<ol style="list-style-type: none"> 1. If an optional expansion unit is installed, reseal it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. Reseat the I/O expansion card in slot xx; then, restart the blade server. 3. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. I/O expansion card in slot xx - b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
00150400	SERR: Device Signaled SERR Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	<ol style="list-style-type: none"> 1. If an optional expansion unit is installed, reseal it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. Reseat the I/O expansion card in slot xx; then, restart the blade server. 3. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. I/O expansion card in slot xx - b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 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
00150500	PERR: Master Read parity error Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	<ol style="list-style-type: none"> 1. If an optional expansion unit is installed, reseal it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. Reseat the I/O expansion card in slot xx; then, restart the blade server. 3. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. I/O expansion card in slot xx - b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
00150600	PERR: Primary Write parity error Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	<ol style="list-style-type: none"> 1. If an optional expansion unit is installed, reseal it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. Reseat the I/O expansion card in slot xx; then, restart the blade server. 3. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. I/O expansion card in slot xx - b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 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
00150700	PERR: Secondary signaled parity error Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	<ol style="list-style-type: none"> 1. If an optional expansion unit is installed, reseal it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. Reseat the I/O expansion card in slot xx; then, restart the blade server. 3. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. I/O expansion card in slot xx - b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
00150900	SERR/PERR Detected on PCI bus (no source found)	<ol style="list-style-type: none"> 1. If an optional expansion unit is installed, reseal it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. Reseat each I/O expansion card, restarting the blade server each time. 3. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. I/O expansion card in slot xx - b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 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
00151000	SERR: Signaled Target Abort Slot=xx Vendor ID=xxxx Device ID=xxxx Status=xxxx	<ol style="list-style-type: none"> 1. If an optional expansion unit is installed, reseal it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. Reseat the I/O expansion card in slot xx; then, restart the blade server. 3. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. I/O expansion card in slot xx - b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
00151100	MCA: Recoverable Error Detected Proc	<ol style="list-style-type: none"> 1. Reseat the microprocessor. 2. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
00151200	MCA: Unrecoverable Error Detected Proc	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat the microprocessor. 2. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” 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 8014, 8028 and 1916,” on page 21 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
00151300	MCA: Excessive Recoverable Error Detected Proc	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat the microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
00151350	Processor Machine Check Data a Bank= xx APIC ID=xx CR4=xxxx xxxx	Additional data for debugging. See error codes 00151100, 00151200, and 00151300 for action.
00151351	Processor Machine Check Data b Address= xxxx xxxx xxxx xxxx Time stamp=xxxx xxxx xxxx xxxx	Additional data for debugging. See error codes 00151100, 00151200, and 00151300 for action.
00151352	Processor Machine Check Data b Status= xxxx xxxx xxxx xxxx	Additional data for debugging. See error codes 00151100, 00151200, and 00151300 for action. If bit 10 of Data b status is set, do not replace the microprocessor.

- 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 8014, 8028 and 1916,” on page 21 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
00151500	Excessive Single Bit Errors Detected DIMM= <i>xx</i>	<ol style="list-style-type: none"> 1. Reseat DIMM <i>xx</i> and the expansion unit if one is installed. <ul style="list-style-type: none"> • DIMMs - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. • Optional expansion unit - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. DIMM <i>xx</i> - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. b. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. c. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
00151700	Started Hot Spare memory Copy. Failed row/rows= <i>xx</i> and <i>yy</i> copied to spare row/rows= <i>aa</i> and <i>bb</i>	<ol style="list-style-type: none"> 1. Reseat a DIMM - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. See error code 00151500 to determine which DIMM to reseat. 2. Replace a DIMM - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. See error code 00151500 to determine which DIMM to replace.
00151710	Completed Hot Spare memory Copy. Failed row/rows= <i>xx</i> and <i>yy</i> copied to spare row/rows= <i>aa</i> and <i>bb</i>	<ol style="list-style-type: none"> 1. Reseat a DIMM - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. See error code 00151500 to determine which DIMM to reseat. 2. Replace a DIMM - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. See error code 00151500 to determine which DIMM to replace.

- 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 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
00151720	Parity Error Reseat the microprocessor. Detected on Processor bus.	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat the microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
00151730	CRC Error	Reseat all DIMMs - See “Removing a memory module” on page 40 and “Installing a memory module” on page 42.
01295085	ECC checking hardware test failed	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat the microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. 2. Replace the following components, one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
012980xx	The BIOS does not support the Processor Pxx	<ol style="list-style-type: none"> 1. Make sure that the microprocessor is supported. 2. Update the blade server firmware. Go to http://www.ibm.com/systems/support/.

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916,” on page 21 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
012981xx	Unable to apply the Microcode Update for Processor xx	<ol style="list-style-type: none"> 1. Make sure that the microprocessor is supported. 2. Replace the microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58.
I9990303	No Boot devices found	Install the operating system on the storage drive - See the <i>Installation and User's Guide</i> .
I999301	Fixed disk boot sector error.	<ol style="list-style-type: none"> 1. Reseat the storage drive. Depending on your storage drive configuration, use the following information to reseat your storage drives: <ul style="list-style-type: none"> • Fixed-storage drive - See “Removing a fixed-storage drive” on page 37 and “Installing a fixed-storage drive” on page 38. • Hot-swap storage drive - See “Removing a hot-swap storage drive” on page 39 and “Installing a hot-swap storage drive” on page 40. 2. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Storage drive - Depending on your storage-drive configuration, replace one of the following: <ul style="list-style-type: none"> • Fixed-storage drive - See “Removing a fixed-storage drive” on page 37 and “Installing a fixed-storage drive” on page 38. • Hot-swap storage drive - See “Removing a hot-swap storage drive” on page 39 and “Installing a hot-swap storage drive” on page 40. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.

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

Exception: If multiple error codes or light path diagnostics LEDs indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 113 for information about diagnosing microprocessor problems.

- If the blade server is halted and a POST error code is displayed, see “POST error codes” on page 82. If the blade server is halted and no error message is displayed, see “Troubleshooting tables” on page 110 and “Solving undetermined problems” on page 167.
- For intermittent problems, check the error log; see “Error logs” on page 72 and “Dynamic system analysis diagnostic programs and messages” on page 128.
- If no LEDs are lit on the blade server front panel, verify the blade server status and errors in the management-module Web interface; also see “Solving undetermined problems” on page 167.
- If device errors occur, see “Troubleshooting tables” on page 110.

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 110.
3. Record any POST beep codes that sound or POST error messages that are displayed on the monitor. If an error is displayed, look up the first error in the “POST error codes” on page 82.
4. Check the control panel blade-error LED; if it is lit, check the light path diagnostics LEDs (see “Light path diagnostics” on page 123).
5. Check for the following results:
 - Successful completion of POST, indicated by a single beep.
 - Successful completion of startup, indicated by a readable display of the operating-system desktop.
6. Did a single beep sound and are there readable instructions on the main menu?
 - **No:** Find the failure symptom in “Troubleshooting tables” on page 110; if necessary, see “Solving undetermined problems” on page 167.

- **Yes:** Run the diagnostic programs (see Chapter 6, “Diagnostics,” on page 63).
 - If you receive an error, see “Diagnostic messages” on page 131.
 - If the diagnostic programs were completed successfully and you still suspect a problem, see “Solving undetermined problems” on page 167.

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 163.

If you cannot find a problem in these tables, see Chapter 6, “Diagnostics,” on page 63 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 64.
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.

<ul style="list-style-type: none"> • See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
<p>A cover lock is broken, an LED is not working, or a similar problem has occurred.</p>	<ul style="list-style-type: none"> • If the part is a CRU, replace it - See “Removing and replacing Tier 1 customer replaceable units (CRUs)” on page 31 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 56. Or contact an IBM service representative, see “Hardware service and support” on page 173.

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.

<ul style="list-style-type: none"> • See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. Remove the storage drive that is indicated by the diagnostic tests. See Chapter 5, “Removing and replacing blade server components,” on page 27. 2. Run the SAS Fixed Disk or SAS Attached Disk diagnostic test again. See “Diagnostic tools overview” on page 63. 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 27.
The blade server stops responding during the Fixed Disk or SAS Attached Disk diagnostic test.	<ol style="list-style-type: none"> 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 27. 2. Run the SAS Fixed Disk or SAS Attached Disk diagnostic test again. See “Diagnostic tools overview” on page 63. 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 27.
A storage drive passes the Fixed Disk or SAS Attached Disk diagnostics test, but the problem remains.	<ol style="list-style-type: none"> 1. Run the SAS Fixed Disk or SAS Attached Disk diagnostic test again. See “Diagnostic tools overview” on page 63. 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.

<ul style="list-style-type: none"> • See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • 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 BMC log (see “Error logs” on page 72). 3. See “Solving undetermined problems” on page 167.

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 163.

<ul style="list-style-type: none"> • See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 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 163). 3. Make sure that: <ul style="list-style-type: none"> • The device drivers are installed correctly. See “Firmware updates” on page 18 • 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 61 and “Installing the system-board assembly” on page 62.

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.

<ul style="list-style-type: none"> • See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • You have installed the correct type of memory. • If you changed the memory, you updated the memory configuration in the Configuration/Setup Utility program. • All banks of memory are enabled. The blade server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled. 2. Check BMC log for error message 289: <ul style="list-style-type: none"> • If a DIMM was disabled by a systems-management interrupt (SMI), replace the DIMM. • If a DIMM was disabled by the user or by POST, run the Configuration/Setup Utility program and enable the DIMM. 3. Reseat the DIMM, and the optional expansion unit (if one is installed). 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Optional expansion unit (if one is installed) b. DIMM c. (Trained service technician only) System-board assembly
Multiple rows of DIMMs in a branch are identified as failing.	<ol style="list-style-type: none"> 1. Reseat the DIMMs; then, restart the server. 2. Remove the lowest-numbered DIMM pair of those that are identified and replace it with an identical pair of known good DIMMs; then, restart the server. Repeat as necessary. If the failures continue after all identified pairs are replaced, go to step “Memory problems” on page 112. 3. Return the removed DIMMs, one pair at a time, to their original connectors, restarting the server after each pair, until a pair fails. Replace each DIMM in the failed pair with an identical known good DIMM, restarting the server after each DIMM. Replace the failed DIMM. Repeat step “Memory problems” on page 112 until all removed DIMMs have been tested. 4. (Trained service technician only) Replace the system board.

Microprocessor problems

Use this information to diagnose and resolve microprocessor 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.

<ul style="list-style-type: none"> • See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
The blade server emits a continuous beep during POST, indicating that the startup (boot) microprocessor is not working correctly.	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat the microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. 2. (Trained service technician only) Replace the microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58.

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 163.

<ul style="list-style-type: none"> • See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 163). 2. Make sure that: <ul style="list-style-type: none"> • Damaged BIOS code is not affecting the video; see “Recovering from a BIOS update failure” on page 161. <p>Important: In some memory configurations, the 3-3-3 beep code might sound during POST, followed by a blank monitor screen. If this occurs and the Boot Fail Count option in the Start Options of the Configuration/Setup Utility program is enabled, you must restart the blade server three times to reset the configuration settings to the default configuration (the memory connector or band of connectors enabled).</p> <ul style="list-style-type: none"> • The device drivers are installed correctly. 3. (Trained service technician only) Replace the system-board assembly
The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 163). 2. (Trained service technician only) Replace the system-board assembly.
Wrong characters appear on the screen.	<ol style="list-style-type: none"> 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 163). 3. (Trained service technician only) Replace the system-board assembly.

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 163.

<ul style="list-style-type: none"> • See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163). 2. Make sure that: <ul style="list-style-type: none"> • The correct device drivers are installed. See “Firmware updates” on page 18. • The Ethernet controller is correctly configured. See “Configuring the Gigabit Ethernet controller” on page 19. • Optional I/O expansion cards are correctly installed and configured. See “Installing an I/O expansion card” on page 47 and Chapter 3, “Configuring the blade server,” on page 15. 3. (Trained service technician only) Replace the system-board assembly. See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.

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.

<ul style="list-style-type: none"> • See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. Make sure that: <ul style="list-style-type: none"> • 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 Configuration/Setup Utility program. Whenever memory or any other device is changed, you must update the configuration. See Configuration/Setup Utility menu. 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 56. 4. Replace the device that you just installed. See “Removing and replacing field replaceable units” on page 56.

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 163.

<ul style="list-style-type: none"> • See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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	<ol style="list-style-type: none"> 1. Reseat the blade server - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 3. If an optional expansion unit is installed, reseat it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 4. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. b. (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
VRD Power Good fault	<ol style="list-style-type: none"> 1. Reseat the blade server - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
System over recommended voltage for +12 V.	<p>Informational only.</p> <p>Note: If the problem remains, complete the following steps:</p> <ol style="list-style-type: none"> 1. Reseat the blade server - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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: <ol style="list-style-type: none"> 1. Reseat the blade server - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
System over recommended voltage for +3.3 V.	Informational only. Note: If the problem remains, complete the following steps: <ol style="list-style-type: none"> 1. Reseat the blade server - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
System over recommended 5 V fault.	Informational only. Note: If the problem remains, complete the following steps: <ol style="list-style-type: none"> 1. Reseat the blade server - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
System under recommended voltage for +12 V.	Informational only. Note: If the problem remains, complete the following steps: <ol style="list-style-type: none"> 1. Reseat the blade server - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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: <ol style="list-style-type: none"> 1. Reseat the blade server - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
System under recommended voltage for +3.3 V.	Informational only. Note: If the problem remains, complete the following steps: <ol style="list-style-type: none"> 1. Reseat the blade server - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
System under recommended +5 V fault.	Informational only. Note: If the problem remains, complete the following steps: <ol style="list-style-type: none"> 1. Reseat the blade server - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 2. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.

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 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. Reseat the control-panel connector - See “Blade server controls and LEDs” on page 7. 2. Replace the bezel assembly - See “Removing the bezel assembly” on page 35 and “Installing the bezel assembly” on page 36. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
The blade server does not turn on.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 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 7. <ul style="list-style-type: none"> • If the power LED is flashing rapidly and continues to do so, the blade server is not communicating with the management module; reseat the blade server. See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. • 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 29 and “Installing the blade server in a BladeCenter unit” on page 30. 3. Check the power-management policies in the operating system for the blade server. See the <i>Management Module User’s Guide</i> for more information. 4. Check the 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 72. 5. Reseat the blade server - See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 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: <ol style="list-style-type: none"> a. If an optional expansion unit is installed, reseat it - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. b. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> 1) Optional expansion unit (if one is installed) - See “Removing an optional expansion unit” on page 33 and “Installing an optional expansion unit” on page 34. 2) (Trained service technician only) System-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62. 8. See “Solving undetermined problems” on page 167.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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 turns off for no apparent reason.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 2. (Trained service technician only) If the microprocessor error LED is lit, replace the microprocessor - See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
The blade server does not turn off.	<ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> a. Turn off the blade server by pressing the power-control button for 4 seconds. See “Blade server controls and LEDs” on page 7. b. If the blade server fails during POST and the power-control button does not work, remove the blade server from the bay and reseal it. See “Removing the blade server from the BladeCenter unit” on page 29 and “Installing the blade server in a BladeCenter unit” on page 30. 3. If the problem remains or if you are using an ACPI-aware operating system, complete the following steps: <ol style="list-style-type: none"> a. Check the power-management policies in the operating system for the blade server. b. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.

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 163.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 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 163. 3. Run the Configuration/Setup Utility program and make sure that the drive is enabled. See Configuration/Setup Utility menu. 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 53 and “Installing the battery” on page 54. 6. Replace the battery - See “Removing the battery” on page 53 and “Installing the battery” on page 54. 7. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
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.)	<p>Establish a link between /dev/sr0 and /dev/cdrom as follows:</p> <ol style="list-style-type: none"> 1. Enter the following command: <code>rm /dev/cdrom; ln -s /dev/sr0 /dev/cdrom</code> 2. Insert the following line in the /etc/fstab file: <code>/dev/cdrom /media/cdrom auto ro,noauto,user,exec 0 0</code>
The CD or DVD drive is not recognized after being switched back to the blade server running Windows 2000 Advanced Server with SP3 applied. (When the CD or DVD drive that is owned by blade server <i>x</i> is switched to another blade server, then is switched back to blade server <i>x</i> , the operating system in blade server <i>x</i> no longer recognizes the CD or DVD drive. This happens when you have not safely stopped the drives before you switched ownership of the media tray [CD or DVD drive, diskette drive, and USB port]).	<p>Note: Because the BladeCenter unit uses USB to communicate with the media tray devices, switching ownership of the media tray to another blade server is the same as disconnecting a USB device. Before you switch ownership of the CD or DVD drive (media tray) to another blade server, safely stop the media tray devices on the blade server that currently owns the media tray, as follows:</p> <ol style="list-style-type: none"> 1. Double-click the Unplug/Eject Hardware icon in the Windows taskbar. 2. Select USB Floppy and click Stop. 3. Select USB Mass Storage Device and click Stop. 4. Click Close. <p>You can now safely switch ownership of the media tray to another blade server.</p>

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 <i>ServerGuide Setup and Installation</i> CD will not start.	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • Make sure that there are no duplicate SCSI/SAS IDs or interrupt request (IRQ) assignments. See “Configuring a SAS RAID array” on page 19. • Make sure that the storage drive is connected correctly. See “System-board connectors” on page 11 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 <i>ServerGuide Setup and Installation</i> 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.

Service processor problems

Use this information to diagnose and resolve service processor 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.

<ul style="list-style-type: none"> • See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
The management module reports a general monitor failure.	Disconnect the BladeCenter unit from all electrical sources, wait for 30 seconds, reconnect the BladeCenter unit to the electrical sources, and restart the blade server. If the problem remains, see “Solving undetermined problems” on page 167.

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 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. To determine whether the problem is caused by the software, make sure that: <ul style="list-style-type: none"> • 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 163.

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 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 2. Make sure that: <ul style="list-style-type: none"> • 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/. 3. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.

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

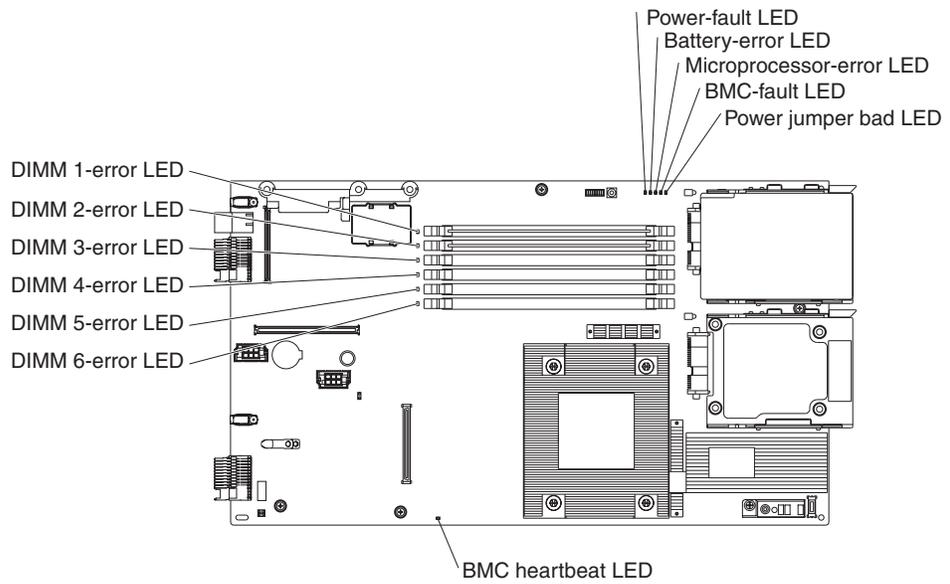
Use this information to locate and identify the light path diagnostics LEDs.

Before you work inside the blade server to view light path diagnostics LEDs, read “Safety” on page v and “Installation guidelines” on page 27.

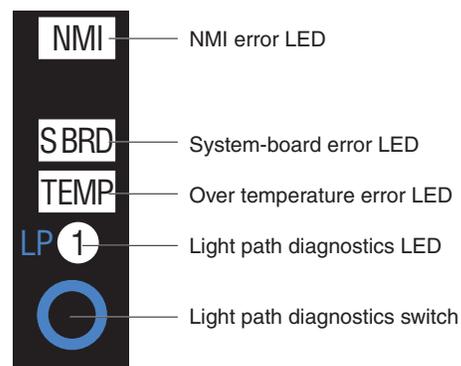
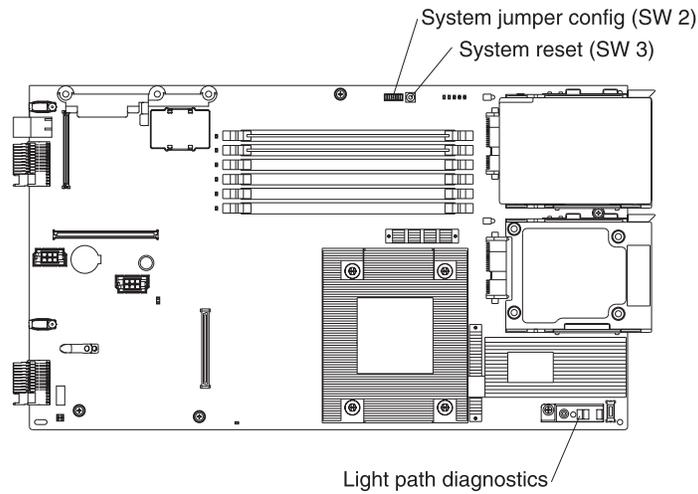
If an error occurs, view the light path diagnostics LEDs in the following order:

1. Look at the control panel on the front of the blade server (see “Blade server controls and LEDs” on page 7).
 - If the information LED is lit, it indicates that information about a suboptimal condition in the blade server is available in the BMC log or in the management-module event log.
 - If the blade-error LED is lit, it indicates that an error has occurred; 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 29.
 - 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 31.
 - 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.

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 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 124. 2. Check the BMC log for information about an error that is not represented by a light path diagnostics LED. See <code>dw1hb_t_using_the_configuration_setup_utility_program.dita</code>.
DIMM x error	A memory error occurred.	<ol style="list-style-type: none"> 1. Make sure that the DIMM that is indicated by the lit LED is supported. See “Viewing the light path diagnostics LEDs” on page 124. 2. Reseat the DIMM that is indicated by the lit LED. See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. 3. Replace the DIMM that is indicated by the lit LED. See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. <p>Note: Multiple DIMM LEDs do not necessarily indicate multiple DIMM failures. If more than one DIMM LED is lit, reseat or replace one DIMM at a time until the error is corrected.</p>
LP1	<ul style="list-style-type: none"> • 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 124.
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 124.

- 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 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. Check the advanced management module (AMM) log for more information. See dw1hb_t_using_the_configuration_setup_utility_program.di 2. If the log shows that a microprocessor is disabled or that a microprocessor IERR has occurred, perform one of the following actions: <ol style="list-style-type: none"> a. (Trained service technician only) Reseat the microprocessor that is indicated by the lit LED. See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58. b. (Trained service technician only) Replace the microprocessor that is indicated by the lit LED. See “Removing a microprocessor and heat sink” on page 56 and “Installing a microprocessor and heat sink” on page 58.
NMI (NMI error)	The system board has failed.	<ol style="list-style-type: none"> 1. Replace the blade server cover, reinsert the blade server in the BladeCenter unit, and then restart the blade server. Check the BMC log for information about the error. See dw1hb_t_using_the_configuration_setup_utility_program.di 2. (Trained service technician only) Replace the system-board assembly - See “Removing the system-board assembly” on page 61 and “Installing the system-board assembly” on page 62.
S 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 61 and “Installing the system-board assembly” on page 62.
TEMP (Over temperature error)	The system temperature has exceeded a threshold level.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources. See “Solving shared BladeCenter resource problems” on page 163. 2. Make sure that the room temperature is not too high. See “Features and specifications” on page 6 for temperature information.

<ul style="list-style-type: none"> • 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 8014, 8028 and 1916," on page 21 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
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."

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 BIOS 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 167 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 Press F2 for Dynamic System Analysis (DSA) is displayed, press F2.
4. From the diagnostic programs screen, select the test that you want to run and follow the instructions on the screen.

For help with the diagnostic programs, press F1. You also can press F1 from within a help screen to obtain online documentation from which you can select different categories. To exit from the help information, press Esc.

To determine what action you should take as a result of a diagnostic text message or error code, see the table in “Diagnostic messages” on page 131.

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

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

Exception: If there are multiple error codes or light path diagnostics LEDs that indicate a microprocessor error, the error might be in a microprocessor or in a microprocessor socket. See “Microprocessor problems” on page 113 for information about diagnosing microprocessor problems.

If the blade server stops responding during testing and you cannot continue, restart the blade server and try running the diagnostic programs again. If the problem remains, replace the component that was being tested when the blade server stopped.

The diagnostic programs assume that a keyboard and mouse are attached to the BladeCenter unit and that the blade server controls them. If you run the diagnostic programs with either no mouse or a mouse attached to the BladeCenter unit that is

not controlled by the blade server, you cannot use the **Next Cat** and **Prev Cat** buttons to select categories. All other mouse-selectable functions are available through function keys.

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

Diagnostic text messages

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 BIOS 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 130 for more information.

BMC self tests

Use this information to resolve BMC self-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 8014, 8028 and 1916,” on page 21 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 BMC test due to a failure in the host bus.	<ol style="list-style-type: none"> 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 29. 2. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 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 reseal 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 29 and “Turning on the blade server” on page 9. 7. Rerun the test. See “Diagnostic tools overview” on page 63. 8. If the failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
166-902-xxx	Failed the BMC self test due to a failure in SIO Bus and DASD SEP.	<ol style="list-style-type: none"> 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 29 for more information. 2. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 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 reseal 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 29 for more information. 7. Rerun the test. 8. If the failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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 BMC self test due to a failure in the LAN or cKVM bus.	<ol style="list-style-type: none"> 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 29 for more information. 2. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 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. Make sure that the Ethernet device 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. 7. Turn off the blade server and reseal 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 29 for more information. 8. Rerun the test. 9. If the failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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 BMC self test due to a failure in the main expander.	<ol style="list-style-type: none"> 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 29 for more information. 2. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 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 reseal 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 29 for more information. 7. Rerun the test. See “Diagnostic tools overview” on page 63. 8. If the failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
166-905-xxx	Failed the BMC self test due to a failure in the CPU/VRD bus.	<p>Note: Ignore this error if the direct access storage device (DASD) planar is not installed.</p> <ol style="list-style-type: none"> 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 29 for more information. 2. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 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 BMC 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, remove the blade server from the blade server bay and remove the cover. (See “Removing the blade server cover” on page 31 for more information). 7. Locate the microprocessor and reseal it. (See “Removing a microprocessor and heat sink” on page 56 for more information.) 8. Close the cover and reseal the blade server in the blade server bay and turn on the blade server. 9. Rerun the test. See “Diagnostic tools overview” on page 63. 10. If the failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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 BMC self test due to a failure in VPD or Power PSOC.	<ol style="list-style-type: none"> 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 29 for more information. 2. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 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 BMC 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 29 for more information. 7. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 8. Rerun the test. See “Diagnostic tools overview” on page 63. 9. If the failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
166-907-xxx	Failed the BMC self test due to a failure in the EXP A0 bus.	<ol style="list-style-type: none"> 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 29 for more information. 2. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 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 BMC 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 29 for more information. 7. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 8. Rerun the test. See “Diagnostic tools overview” on page 63. 9. If the failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
166-908-xxx	Failed the BMC self test due to a failure in the EXP A1 bus.	<ol style="list-style-type: none"> 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 29 for more information. 2. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 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 BMC 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 29 for more information. 7. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 8. Rerun the test. See “Diagnostic tools overview” on page 63. 9. If the failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
166-909-xxx	Failed the BMC self test due to a failure in the EXP B bus.	<ol style="list-style-type: none"> 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 29 for more information. 2. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 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 BMC 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 29 for more information. 7. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 8. Rerun the test. See “Diagnostic tools overview” on page 63. 9. If the failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
166-910-xxx	Failed the BMC self test due to a failure in the onboard legacy daughter card.	<ol style="list-style-type: none"> 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 29 for more information. 2. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 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 BMC 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 29 for more information. 7. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 8. Rerun the test. See “Diagnostic tools overview” on page 63. 9. If the failure remains, see Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
166-911-xxx	Failed the BMC self test due to a failure in the BSE-3 PCI-X A slot.	<ol style="list-style-type: none"> 1. Turn off the blade server. See “Turning off the blade server” on page 10. 2. 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 29. 3. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 4. Rerun the test. See “Diagnostic tools overview” on page 63. 5. 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. 6. Make sure that the BMC 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. 7. 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 29. 8. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 9. Rerun the test. See “Diagnostic tools overview” on page 63. 10. If the failure remains, see Chapter 5, “Removing and replacing blade server components,” on page 27.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
166-912-xxx	Failed the BMC self test due to a failure in the BSE-3 PCI-X B slot.	<ol style="list-style-type: none"> 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 29 for more information. 2. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 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 BMC 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 29 for more information. 7. Wait 45 seconds and reseal 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 30 and “Turning on the blade server” on page 9. 8. Rerun the test. See “Diagnostic tools overview” on page 63. 9. If the failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

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.

<ul style="list-style-type: none"> • See Chapter 4, "Parts listing, Types 8014, 8028 and 1916," on page 21 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
405-002-xxx	Passed the EEPROM test on the system board.	N/A
405-903-xxx	Failed the EEPROM test on the system board.	<ol style="list-style-type: none"> 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-4JTS2T. 2. If the failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 27 to replace the failed component.
405-003-xxx	Passed the Internal memory test.	N/A
405-904-xxx	Failed the Internal memory test.	<ol style="list-style-type: none"> 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-4JTS2T. 2. If the failure remains, refer to Chapter 5, "Removing and replacing blade server components," on page 27 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 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. If the blade server has stopped responding, turn off and restart the blade server. See “Turning off the blade server” on page 10 and “Turning on the blade server” on page 9. 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 10 and “Turning on the blade server” on page 9. 5. (Trained service technician only) If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. If the blade server has stopped responding, turn off and restart the blade server. See “Turning off the blade server” on page 10 and “Turning on the blade server” on page 9. 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 10 and “Turning on the blade server” on page 9. 5. (Trained service technician only) If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 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 10 and “Turning on the blade server” on page 9. 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-4JTS2T. 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 27 to replace the failed component.

Memory self tests

Use this information to diagnose and resolve memory-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 8014, 8028 and 1916,” on page 21 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
210-000-000	Passed the memory self test.	N/A

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
201-811-xxx	Aborted the memory self test because the test was unable to locate the _SM_ key when locating the SMBIOS structure data.	<ol style="list-style-type: none"> 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 10, “Turning on the blade server” on page 9 and “Diagnostic tools overview” on page 63. 2. Make sure that the system BIOS firmware is at the latest level, upgrade if necessary; then, rerun the test (“Diagnostic tools overview” on page 63). 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-4JTS2T. 3. Rerun the test. See “Diagnostic tools overview” on page 63. 4. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component. 5. Rerun the test. See “Diagnostic tools overview” on page 63.
201-812-xxx	Aborted the memory self test because the SMBIOS type 0 structure indicates a non-supported, invalid machine ID.	<ol style="list-style-type: none"> 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 10, “Turning on the blade server” on page 9 and “Diagnostic tools overview” on page 63. 2. Make sure that the system BIOS firmware is at the latest level, upgrade if necessary; then, rerun the test (“Diagnostic tools overview” on page 63). 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-4JTS2T. 3. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component. 4. Rerun the test.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
201-815-xxx	Aborted the memory self test because of a programming error in the Quick Memory menu item selection process.	<ol style="list-style-type: none"> 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 10, “Turning on the blade server” on page 9 and “Diagnostic tools overview” on page 63. 2. Make sure that the DSA Diagnostic code is at the latest level; then, rerun the test (“Diagnostic tools overview” on page 63). 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 63). 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-4JTS2T. 4. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.
201-818-xxx	Aborted the memory self test because the test was unable to locate the _SM_ key when locating the SMBIOS structure data for the memory information.	<ol style="list-style-type: none"> 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 10, “Turning on the blade server” on page 9 and “Diagnostic tools overview” on page 63. 2. Make sure that the system BIOS firmware is at the latest level, upgrade if necessary; then, rerun the test (“Diagnostic tools overview” on page 63). 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-4JTS2T. 3. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
201-819-xxx	Aborted the memory self test because the START-END address ranges are located in the restricted area of memory.	<ol style="list-style-type: none"> 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 10, “Turning on the blade server” on page 9 and “Diagnostic tools overview” on page 63. 2. Make sure that the DSA Diagnostic code is at the latest level; then, rerun the test (“Diagnostic tools overview” on page 63). 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 63). 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-4JTS2T. 4. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.
201-877-xxx	Aborted the memory self test because the Mirroring feature is enabled.	<ol style="list-style-type: none"> 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 10, “Turning on the blade server” on page 9 and “Diagnostic tools overview” on page 63. 2. Press F1 during start up and turn off the Mirroring feature; then, rerun the test. See “Diagnostic tools overview” on page 63. 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 63). 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-4JTS2T. 4. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
201-878-xxx	Aborted the memory self test because the Sparing feature is enabled.	<ol style="list-style-type: none"> 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 10, “Turning on the blade server” on page 9 and “Diagnostic tools overview” on page 63. 2. Press F1 during start up and turn off the Mirroring feature; then, rerun the test. See “Diagnostic tools overview” on page 63. 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 63). 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-4JTS2T. 4. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.
201-885-xxx	Aborted the memory self test because the microprocessor does not support MTRR functions and cannot de-cache available memory.	<ol style="list-style-type: none"> 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 10, “Turning on the blade server” on page 9 and “Diagnostic tools overview” on page 63. 2. Make sure that the DSA Diagnostic code is at the latest level; then, rerun the test (“Diagnostic tools overview” on page 63). 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 63). 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-4JTS2T. 4. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
201-886-xxx	Aborted due to a program error in the E820 function call, which indicates there is not enough available memory for testing.	<ol style="list-style-type: none"> 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 10, “Turning on the blade server” on page 9 and “Diagnostic tools overview” on page 63. 2. Make sure that the system BIOS firmware is at the latest level, upgrade if necessary; then, rerun the test (“Diagnostic tools overview” on page 63). 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-4JTS2T. 3. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.
201-894-xxx	Aborted due to an unexpected error code.	<ol style="list-style-type: none"> 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 10, “Turning on the blade server” on page 9 and “Diagnostic tools overview” on page 63. 2. Make sure that the DSA Diagnostic code is at the latest level; then, rerun the test (“Diagnostic tools overview” on page 63). 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 63). 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-4JTS2T. 4. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.
201-899-xxx	The memory self test was aborted by the user.	The memory self test was terminated by the user before test completion.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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 self test due to a single-bit error in DIMM <i>x</i> OR failed the memory self test due to a multi-bit error in DIMMs <i>x</i> and <i>y</i> .	<ol style="list-style-type: none"> 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 10 and “Removing the blade server from the BladeCenter unit” on page 29. 2. Reseat DIMM <i>x</i>. See “Removing a memory module” on page 40 and “Installing a memory module” on page 42. 3. Return the blade server to the blade server bay and turn on the blade server. See “Installing the blade server in a BladeCenter unit” on page 30 and “Turning on the blade server” on page 9. 4. Make sure that the DSA Diagnostic code is at the latest level; then, rerun the test (“Diagnostic tools overview” on page 63). 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 system BIOS firmware is at the latest level, upgrade if necessary; then, rerun the test (“Diagnostic tools overview” on page 63). 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-4JTS2T. 6. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failing DIMMs. 7. Return the blade server to the blade server bay (“Installing the blade server in a BladeCenter unit” on page 30), press F1 during start up and in the Configuration/Setup Utility program > Resource Utilization section, click Available System Memory to re-enable all memory; then, rerun the test (“Diagnostic tools overview” on page 63).

Optical drive self tests

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 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 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 63). 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 63. 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-4JTS2T. 7. Rerun the test. See “Diagnostic tools overview” on page 63. 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 send it to IBM Service. For information about contacting and sending data to IBM Service, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 1. Close the media tray and wait 15 seconds. See your BladeCenter documentation for information about the optical drive (media tray). 2. Rerun the test. See “Diagnostic tools overview” on page 63. 3. 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 63. 4. 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). 5. 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). 6. Rerun the test. See “Diagnostic tools overview” on page 63. 7. 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. 8. Rerun the test. See “Diagnostic tools overview” on page 63. 9. For additional troubleshooting information, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559. 10. Rerun the test. See “Diagnostic tools overview” on page 63. 11. Replace the CD or DVD drive (media tray). See your BladeCenter documentation for information about replacing the optical drive. 12. 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, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 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 10, “Turning on the blade server” on page 9 and “Diagnostic tools overview” on page 63. 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 63) and send it to IBM Service. For information about contacting and sending data to IBM Service, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.
215-901-xxx	Aborted the optical drive self test because the drive media was not detected.	<ol style="list-style-type: none"> 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 63. 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 63. 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 63. 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 63) and send it to IBM Service. For information about contacting and sending data to IBM Service, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 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 63. 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 63. 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 63. 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, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 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 63. 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 63. 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, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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.	<ol style="list-style-type: none"> 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 63. 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 63. 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 63. 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, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-CALL.

Storage drive self tests

Use this information to diagnose and resolve storage drive self 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 8014, 8028 and 1916,” on page 21 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 self test.	N/A

- See Chapter 4, “Parts listing, Types 8014, 8028 and 1916,” on page 21 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
217-900-xxx	Failed the storage drive self test.	<ol style="list-style-type: none"> 1. Make sure that the storage drive is securely connected in the storage drive connector, then; reseal the storage drive. 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-4JTS2T. 4. Rerun the test. 5. If the component failure remains, refer to Chapter 5, “Removing and replacing blade server components,” on page 27 to replace the failed component.
217-800-xxx	The storage drive self test was terminated by the user.	N/A

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.

Recovering from a BIOS update failure

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

The blade server has an advanced recovery feature that will automatically switch to a backup BIOS page if the BIOS code in the blade server has become damaged, such as from a power failure during an update. The flash memory of the blade server consists of a primary page and a backup page. If the BIOS code in the primary page is damaged, the baseboard management controller will detect the error and automatically switch to the backup page to start the blade server. If this happens, a POST message *Booted from backup POST/BIOS image* is displayed. The backup page version might not be the same as the primary page version.

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

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

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 HS12 (8014, 8028, 1916)** to display the matrix of downloadable files for the blade server.
5. Select and download the flash BIOS update for your operating environment.
6. Update the BIOS code, following the instructions that come with the update file that you downloaded. This automatically restores and updates the primary page.
7. Restart the blade server.

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

1. Before you begin, read “Safety” on page v and “Installation guidelines” on page 27.

2. Turn off the blade server (see "Turning off the blade server" on page 10).
3. Remove the blade server from the BladeCenter unit (see "Removing the blade server from the BladeCenter unit" on page 29).
4. Remove the cover (see "Removing the blade server cover" on page 31).
5. If an expansion unit is installed, remove it (see "Removing an optional expansion unit" on page 33).
6. Locate switch block SW2-1 on the system board (see "System-board switches" on page 12).
7. Move the BIOS backup page switch (SW3-1) to the On position to enable the backup page.
8. If you removed an optional expansion unit, replace it (see "Installing an optional expansion unit" on page 34).
9. 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 "Installing the blade server cover" on page 32 and "Installing the blade server in a BladeCenter unit" on page 30.
10. Insert the BIOS flash diskette into the diskette drive.
11. Restart the blade server (see "Turning off the blade server" on page 10 and "Turning on the blade server" on page 9). The system begins the power-on self-test (POST).
12. Select **1 - Update POST/BIOS** from the menu that contains various flash (update) options.

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

Attention: Do *not* restart the blade server at this time.
16. When the update is complete, remove the flash diskette from the diskette drive.
17. Turn off the blade server and remove it from the BladeCenter unit (see "Turning off the blade server" on page 10 and "Removing the blade server from the BladeCenter unit" on page 29).
18. Remove the cover of the blade server (see "Removing the blade server cover" on page 31).
19. If an expansion unit is installed, remove it (see "Removing an optional expansion unit" on page 33).
20. Move switch SW3-1 to Off to return to the normal startup mode.
21. If you removed an optional expansion unit, replace it (see "Installing an optional expansion unit" on page 34).
22. Replace the cover and reinstall the blade server in the BladeCenter unit. See "Installing the blade server cover" on page 32 and "Installing the blade server in a BladeCenter unit" on page 30.
23. Restart the blade server (see "Turning on the blade server" on page 9).

Service processor (BMC) error codes

Use this information to view the BMC error log.

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

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

Solving SAS hard disk drive problems

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 167.

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 management module.
 - The keyboard or mouse works with another blade server.
2. Check for correct management-module operation (see the documentation for your BladeCenter unit).

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

3. Replace the keyboard or mouse.
4. Replace the management module (see the documentation for your BladeCenter unit).

If these steps do not solve the problem, it is likely a problem with the blade server. See “Keyboard or mouse problems” on page 111.

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

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

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

If these steps do not solve the problem, it is likely a problem with the blade server. See “Removable-media drive problems” on page 120 or “Universal Serial Bus (USB) port problems” on page 123.

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 management module for more information).

4. Replace the 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 115.

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 *Management Module User's Guide* or the *Management Module Command-Line Interface Reference Guide* for information).
- Local power control for the blade server is correctly set (see the *Management Module User's Guide* or the *Management Module Command-Line Interface Reference Guide* for information).
- The BladeCenter unit blowers are correctly installed and operational.

If these procedures do not solve the problem, it is likely a problem with the blade server. See “Power error messages” on page 116 and “Power problems” on page 118.

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 management module. Non-IBM monitor cables might cause unpredictable problems.
 - The monitor works with another blade server.
 - Some IBM monitors have their own self-tests. If you suspect a problem with the monitor, see the information that comes with the monitor for instructions for adjusting and testing the monitor. If the monitor self-tests show that the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor.

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

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

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

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

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

If these steps do not solve the problem, it is likely a problem with the blade server. See "Monitor or video problems" on page 114.

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 122.

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, remove and replace the battery to override the power-on password and clear the CMOS memory; see “Removing the battery” on page 53. If you suspect that the BIOS code is damaged, see “Recovering from a BIOS update failure” on page 161.

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

1. Make sure that the control panel connector is correctly seated on the system board (see “System-board connectors” on page 11 for the location of the connector).
2. If no LEDs on the control panel are working, replace the bezel assembly; then, try to turn on the blade server from the management module (see the documentation for the BladeCenter unit and management module for more information).
3. Turn off the blade server.
4. Remove the blade server from the BladeCenter unit and remove the cover.
5. Remove or disconnect the following devices, one at a time, until you find the failure. Reinstall, turn on, and reconfigure the blade server each time.
 - I/O expansion card.
 - 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)
- BIOS code level
- Operating-system type and version level

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

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

Appendix. 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 to make sure that the hardware and software is supported by your IBM product.
- Go to [www.ibm.com/support](#) 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 [www.ibm.com/support](#) 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 .

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 . IBM System x information is at . IBM BladeCenter information is at . IBM IntelliStation information is at .

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 .

You can use any of the following methods to send diagnostic data to IBM:

- **Standard upload:**
- **Standard upload with the system serial number:**
- **Secure upload:**
- **Secure upload with the system serial number:**

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 . 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 .

For more information about Support Line and other IBM services, see or see 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 and click **Business Partner Locator**. For IBM support telephone numbers, see . 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

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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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IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

Some software might differ from its retail version (if available) and might not include user manuals or all program functionality.

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 4. Limits for particulates and gases

Contaminant	Limits
Particulate	<ul style="list-style-type: none"> The room air must be continuously filtered with 40% atmospheric dust spot efficiency (MERV 9) according to ASHRAE Standard 52.2¹. 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	<ul style="list-style-type: none"> Copper: Class G1 as per ANSI/ISA 71.04-1985³ Silver: Corrosion rate of less than 300 Å in 30 days

Table 4. Limits for particulates and gases (continued)

Contaminant	Limits
	<p>¹ ASHRAE 52.2-2008 - <i>Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size</i>. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.</p> <p>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.</p> <p>³ ANSI/ISA-71.04-1985. <i>Environmental conditions for process measurement and control systems: Airborne contaminants</i>. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.</p>

Documentation format

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Electronic emission notices

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

communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

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

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

Attention: This is an EN 55022 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.

Responsible manufacturer:

International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
914-499-1900

European Community contact:

IBM Deutschland GmbH
Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Telephone: +49 7032 15 2941
Email: lugi@de.ibm.com

Germany Class A statement

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:
Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen.

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG). Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:

International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:

IBM Deutschland GmbH
Technical Regulations, Abteilung M372
IBM-Allee 1, 71139 Ehningen, Germany
Telephone: +49 7032 15 2941
Email: lugi@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

Japan VCCI Class A statement

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case the user may be required to take corrective actions.

Japan Electronics and Information Technology Industries Association (JEITA) statement

高調波ガイドライン適合品

Japan Electronics and Information Technology Industries Association (JEITA)
Confirmed Harmonics Guidelines (products less than or equal to 20 A per phase)

Korea Communications Commission (KCC) statement

이 기기는 업무용(A급)으로 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

This is electromagnetic wave compatibility equipment for business (Type A). Sellers and users need to pay attention to it. This is for any areas other than home.

Russia Electromagnetic Interference (EMI) Class A statement

ВНИМАНИЕ! Настоящее изделие относится к классу А. В жилых помещениях оно может создавать радиопомехи, для снижения которых необходимы дополнительные меры

People's Republic of China Class A electronic emission statement

中华人民共和国“A类”警告声明

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

Taiwan Class A compliance statement

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

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