

BladeCenter LS22 Type 7901 and LS42 Type 7902



Problem Determination and Service Guide

BladeCenter LS22 Type 7901 and LS42 Type 7902



Problem Determination and Service Guide

Note: Before using this information and the product it supports, read the general information in “Notices” on page 169, and the *Warranty and Support Information* document on the *IBM BladeCenter Documentation* CD.

Sixth Edition (July 2009)

© Copyright International Business Machines Corporation 2009.

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

Safety	v
Guidelines for trained service technicians	vi
Inspecting for unsafe conditions	vi
Guidelines for servicing electrical equipment	vii
Safety statements	viii

Chapter 1. Introduction	1
Related documentation	1
Notices and statements in this document	2
Features and specifications.	2
Blade server controls and LEDs	3
Turning on the blade server	5
Turning off the blade server	6
System board layouts	6
System-board connectors	7
System-board switches	8
System board LEDs	9

Chapter 2. Configuring the blade server 11	
Using the Setup Utility program	11
Setup Utility program menu choices	12
Using passwords	14
Using the ServerGuide Setup and Installation CD	14
ServerGuide features	15
Setup and configuration overview	15
Typical operating-system installation	15
Installing the operating system without using ServerGuide	16
Using the PXE boot agent utility program	16
Firmware updates	17
Configuring the Gigabit Ethernet controller.	17
Configuring a SAS RAID array	18
Using the LSI Logic Configuration Utility program	18

Chapter 3. Parts listing, Types 7901 and 7902	19
--	-----------

Chapter 4. Removing and replacing blade server components.	25
Installation guidelines	25
System reliability guidelines	26
Handling static-sensitive devices	26
Returning a device or component	27
Removing the blade server from a BladeCenter unit	27
Installing the blade server in a BladeCenter unit	28
Removing and replacing consumable parts and Tier 1 CRUs.	29
Removing the blade server cover	29
Installing the blade server cover	30
Removing an expansion unit	31
Installing an expansion unit	32
Removing the bezel assembly	33
Installing the bezel assembly	34
Removing a SAS drive.	35

Installing a SAS drive	36
Removing a memory module	37
Installing a memory module.	38
Removing an I/O expansion card	39
Installing an I/O expansion card	43
Removing the battery	48
Installing the battery	48
Removing the LS22 optimizer	49
Installing the LS22 optimizer	50
Removing a concurrent KVM feature card	51
Installing a concurrent KVM feature card	51
Removing a USB flash drive.	52
Installing a USB flash drive	53
Removing and replacing Tier 2 CRUs.	54
Removing the SAS drive tray	54
Installing the SAS drive tray.	55
Removing an expansion-card bracket.	55
Installing an expansion-card bracket	56
Removing and replacing FRUs	57
Removing a microprocessor and heat sink	57
Installing a microprocessor and heat sink	59
Removing the system-board assembly	62
Installing the system-board assembly	62

Chapter 5. Diagnostics	65
Diagnostic tools	65
POST	65
POST beep codes	66
Error logs	72
BMC error messages	73
POST error codes	78
Checkout procedure	88
About the checkout procedure	88
Performing the checkout procedure	89
Troubleshooting tables.	89
General problems	90
Hard disk drive problems	90
Intermittent problems	91
Keyboard or mouse problems	91
Memory problems	92
Microprocessor problems	93
Monitor or video problems	93
Network connection problems	94
Optional-device problems	95
Power error messages	95
Power problems	98
Removable-media drive problems	100
ServerGuide problems	102
Service processor problems	102
Software problems.	103
Universal Serial Bus (USB) port problems	103
Light path diagnostics	103
Viewing the light path diagnostics LEDs	104
Light path diagnostics LEDs	106

Dynamic System Analysis diagnostic programs and messages	108
Running the diagnostic programs	109
Diagnostic text messages	110
Viewing the test log	110
Dynamic System Analysis diagnostic messages	111
Diagnostic error codes	112
Additional diagnostic error codes	149
Recovering from a BIOS update failure	158
Service processor (BMC) error codes	160
Solving SAS hard disk drive problems	160
Solving shared BladeCenter resource problems	160
Keyboard or mouse problems	160
Media tray problems	161
Network connection problems	163
Power problems	163
Video problems	163
Solving undetermined problems	164
Problem determination tips	166

Appendix. Getting help and technical assistance. 167

Before you call	167
Using the documentation	167
Getting help and information from the World Wide Web	168
Software service and support	168

Hardware service and support	168
IBM Taiwan product service	168

Notices 169

Trademarks	169
Important notes	170
Product recycling and disposal	171
Battery return program	172
Electronic emission notices	173
Federal Communications Commission (FCC) statement	173
Industry Canada Class A emission compliance statement	174
Avis de conformité à la réglementation d'Industrie Canada	174
Australia and New Zealand Class A statement	174
United Kingdom telecommunications safety requirement	174
European Union EMC Directive conformance statement	174
Taiwanese Class A warning statement	175
Chinese Class A warning statement	175
Japanese Voluntary Control Council for Interference (VCCI) statement	175
Korean Class A Warning Statement	176

Index 177

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.

在安裝本產品之前，請仔細閱讀 **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 přečtete příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si 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.

Guidelines for trained service technicians

This section contains information for trained service technicians.

Inspecting for unsafe conditions

Use the information in this section to help you identify potential unsafe conditions in an IBM product on which you are working. Each IBM product, as it was designed and manufactured, has required safety items to protect users and service technicians from injury. The information in this section addresses only those items. Use good judgment to identify potential unsafe conditions that might be caused by non-IBM alterations or attachment of non-IBM features or 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 cord is disconnected.
2. Make sure that the exterior cover is not damaged, loose, or broken, and observe any sharp edges.
3. Check the power cord:
 - Make sure that the third-wire ground connector is in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
 - Make sure that the power cord is the correct type, as specified in the documentation for your BladeCenter unit type.
 - Make sure that the insulation is not frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the server for any obvious unsafe conditions, such as metal filings, contamination, water or other liquid, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.

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

Guidelines for servicing electrical equipment

Observe the following guidelines when servicing electrical equipment:

- Check the area for electrical hazards such as moist floors, 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 are working with powered-on electrical equipment, use only one hand. Keep the other hand in your pocket or behind your back to avoid creating a complete circuit that could cause an electrical shock.
 - When 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

Important:

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

For example, if a caution statement 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 document before you perform the procedures. Read any additional safety information that comes with your server or optional device before you install the device.

Statement 1



DANGER

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

To avoid a shock hazard:

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

To Connect:

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 10



CAUTION:

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



Statement 21



CAUTION:

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

Chapter 1. Introduction

This *Problem Determination and Service Guide* contains information to help you solve problems that might occur in your IBM BladeCenter LS22 Type 7901 and LS42 Type 7902 blade server. It describes the diagnostic tools that come with the blade server, error codes and suggested actions, and instructions for replacing failing components.

Replaceable components are of three types:

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

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

Related documentation

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

- *Installation and User's Guide*

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

- *Safety Information*

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

- *Warranty and Support Information*

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

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

The blade server might have features that are not described in the documentation that comes with the server. The documentation might be updated occasionally to

include information about those features, or technical updates might be available to provide additional information that is not included in the blade server documentation.

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/bladecenter/>.
2. Click **Support**.
3. Under **Support information**, click **Product support and information**.
4. Under **Popular links**, click **Publications lookup**.
5. From the **Product family** menu, select **BladeCenter LS22** or **BladeCenter LS42** and click **Go**.

Notices and statements in this document

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 your language in the *Safety Information* document.

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage 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

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

Notes:

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

<p>Microprocessor:</p> <ul style="list-style-type: none"> • 7901 (LS22) models: Supports up to two quad-core AMD Opteron microprocessors • 7902 (LS42) models: Supports up to four quad-core AMD Opteron microprocessors <p>Note: Use the Setup Utility program to determine the type and speed of the microprocessors in your blade server.</p> <p>Memory:</p> <ul style="list-style-type: none"> • Dual-channel DIMMs • Type: Very low profile (VLP), double-data-rate 2 (DDR2), ECC SDRAM registered x4 (Chipkill) or x8 (non-Chipkill) DIMMs • Supports 1 GB, 2 GB, 4 GB, and 8 GB DIMMs (as of the date of this publication) • 7901 (LS22) models: Up to 8 dual-channel DIMMs, supporting up to 64 GB of total memory. • 7902 (LS42) models: Up to 16 dual-channel DIMMs, supporting up to 128 GB of total memory. <p>Drives: Supports up to two small-form-factor, Serial Attached SCSI (SAS) drives or solid state drives.</p> <p>Electrical Input: 12 V dc</p>	<p>7901 (LS22) integrated functions:</p> <ul style="list-style-type: none"> • Dual-port Gigabit Ethernet controller • Expansion card connector • Blade expansion connector • Local service processor: Baseboard management controller (BMC) with Intelligent Platform Management Interface (IPMI) firmware 1.5 compliant • ATI RN-50 video controller • LSI 1064E Serial Attached SCSI (SAS) controller • Light path diagnostics • Dynamic System Analysis (DSA) Preboot diagnostics • RS-485 interface for communication with the management module • Automatic server restart (ASR) • Serial over LAN (SOL) • Four USB buses for communication with keyboard, mouse, and removable media drives • One internal USB connector for a supported USB flash device, such as the IBM USB key for VMware ESXi <p>Size:</p> <ul style="list-style-type: none"> • Height: 24.5 cm (9.7 inches) • Depth: 44.6 cm (17.6 inches) • Width: Single-width models: 2.9 cm (1.14 inches), Double-width models: 4.8 cm (2.28 inches) • Maximum weight: Single-width models: 4.9 kg (10.8 lb), Double-width models: 11.2 kg (24.7 lb) 	<p>7902 (LS42) integrated functions:</p> <ul style="list-style-type: none"> • Two dual-port Gigabit Ethernet controllers • Two expansion card connectors • Blade expansion connector • Local service processor: Baseboard management controller (BMC) with Intelligent Platform Management Interface (IPMI) firmware 1.5 compliant • ATI RN-50 video controller • LSI 1064E Serial Attached SCSI (SAS) controller • Light path diagnostics • Dynamic System Analysis (DSA) Preboot diagnostics • RS-485 interface for communication with the management module • Automatic server restart (ASR) • Serial over LAN (SOL) • Four USB buses for communication with keyboard, mouse, and removable media drives • One internal USB connector for a supported USB flash device, such as the IBM USB key for VMware ESXi <p>Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Blade server on: 10° to 35°C (50° to 95°F). Altitude: 0 to 914 m (0 to 3000 ft) – Blade server on: 10° to 32°C (50° to 90°F). Altitude: 914 to 2134 m (3000 to 7000 ft) – Blade server off: -40° to 60°C (-40° to 140°F) • Humidity: <ul style="list-style-type: none"> – Blade server on: 8% to 80% – Blade server off: 5% to 80% <p>Predictive Failure Analysis (PFA) alerts:</p> <ul style="list-style-type: none"> • Microprocessor • Memory • Hard disk drives
--	---	---

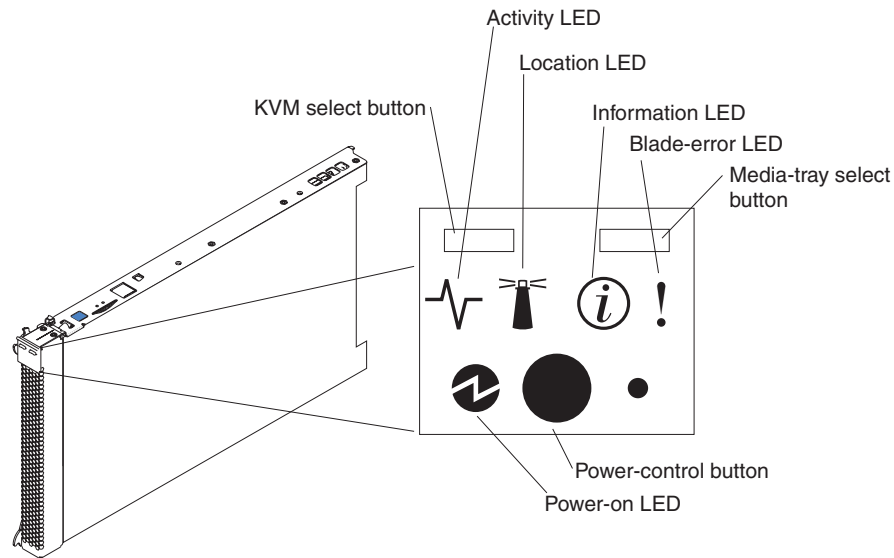
Blade server controls and LEDs

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

Notes:

1. The control panel door is shown in the closed (normal) position in the following illustration. To access the power-control button, you must open the control panel door.

- The following illustration shows a single-width type of blade server. The MPE also interacts with the control panel on the blade server.



KVM select button: Press this button to associate the shared BladeCenter unit keyboard, video, and mouse port (KVM) 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:

```
NumLock NumLock bay_number Enter
```

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

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

Notes:

- 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.
- If you install a supported Microsoft Windows operating system on the blade server while it is not the current owner of the KVM, a delay of up to 1 minute occurs the first time that you switch the KVM to the blade server. During this one-time-only delay, the blade server device manager enumerates the keyboard, video, and mouse and loads the device drivers. All subsequent switching happens in the normal KVM switching time frame (up to 20 seconds).

Media-tray select button: Press this button to associate the shared BladeCenter unit media tray (removable-media drives and front-panel USB ports) with the blade server. The LED on the button flashes while the request is being processed,

and then is lit when the ownership of the media tray has been transferred to the blade server. It can take approximately 20 seconds for the operating system in the blade server to recognize the media tray.

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

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

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

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

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

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.

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.

Turning on the blade server

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

- You can press the power-control button on the front of the blade server (behind the control panel door, see “Blade server controls and LEDs” on page 3) 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 3 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) and the Wake on LAN feature has not been disabled through the management module, the Wake on LAN feature can turn on the blade server.

Turning off the blade server

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

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

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

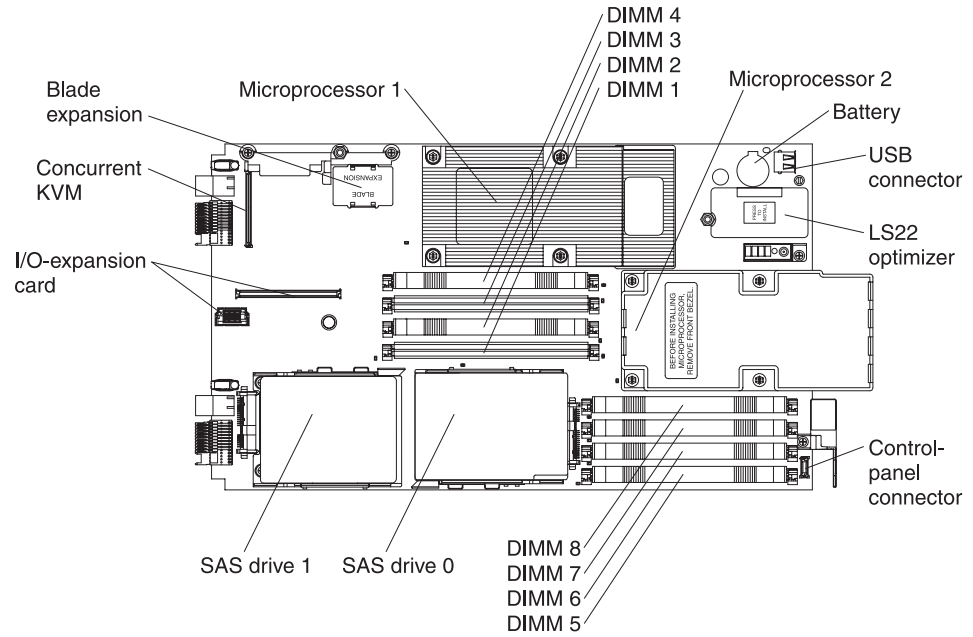
- You can press the power-control button on the blade server (behind the control panel door, see “Blade server controls and LEDs” on page 3). This starts an orderly shutdown of the operating system, if this feature is supported by the operating system.
- If the operating system stops functioning, you 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.
 - If the system is not operating correctly, the management module will automatically turn off the blade server.
 - Through the management-module Web interface, you can also configure the management module to turn off the blade server. For additional information, see the *IBM BladeCenter Management Module User’s Guide*.

System board layouts

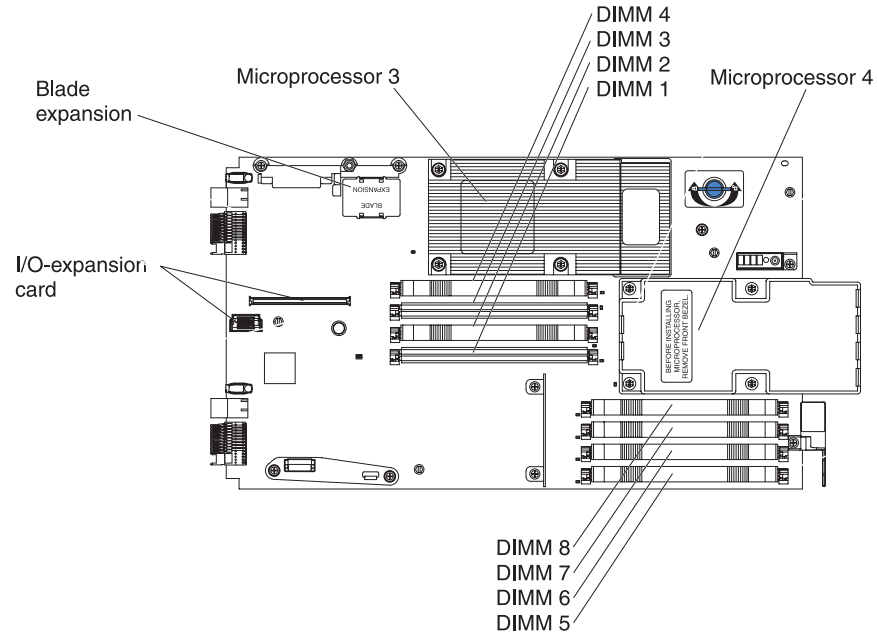
The following illustrations show the connectors, LEDs, and switches on the blade server system board and the multiprocessor expansion (MPE) unit. The illustrations in this document might differ slightly from your hardware.

System-board connectors

The following illustration shows the connectors on the blade server system board.

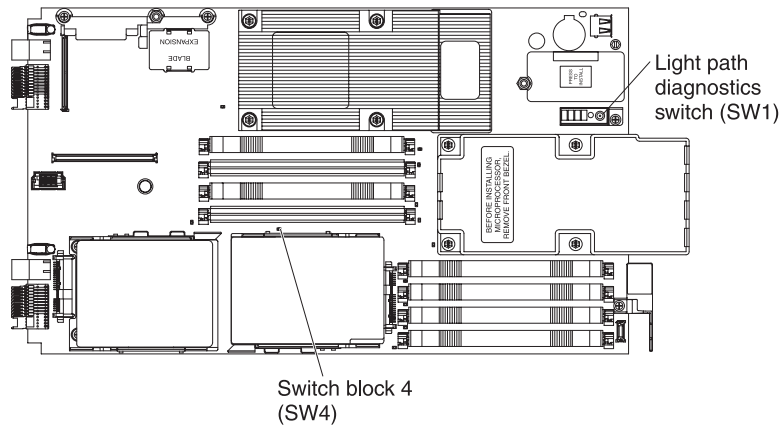


The following illustration shows the connectors on the MPE unit.



System-board switches

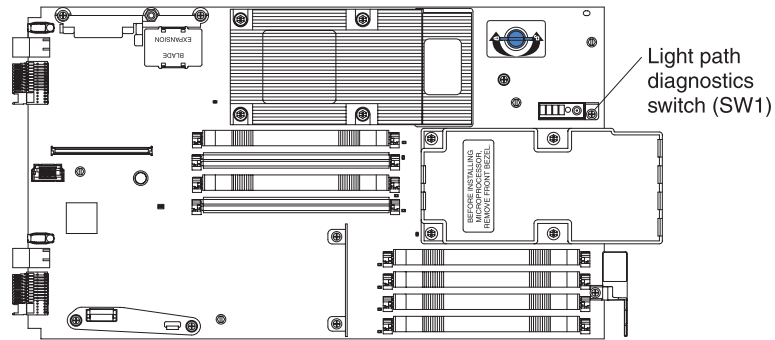
The following illustration shows the switches on the blade server system board.



The following table defines the function of each switch on the blade server system board.

Switch number	Description
SW1	Light path diagnostics switch: Press and hold to relight the system-board LEDs that were lit before you removed the blade server from the BladeCenter unit.
SW4	Switch block 4 has four switches: <ul style="list-style-type: none"> • 1 – Debug serial port <ul style="list-style-type: none"> – Open: Disable (default) – Closed: Enable • 2 – Flash bank select <ul style="list-style-type: none"> – Open: Primary (default) – Closed: Backup • 3 – Password override <ul style="list-style-type: none"> – Open: Disable (default) – Closed: Enable • 4 – Wake on LAN power button bypass <ul style="list-style-type: none"> – Open: Enable (default) – Closed: Disable

The following illustration shows the light path diagnostics switch on the MPE unit.

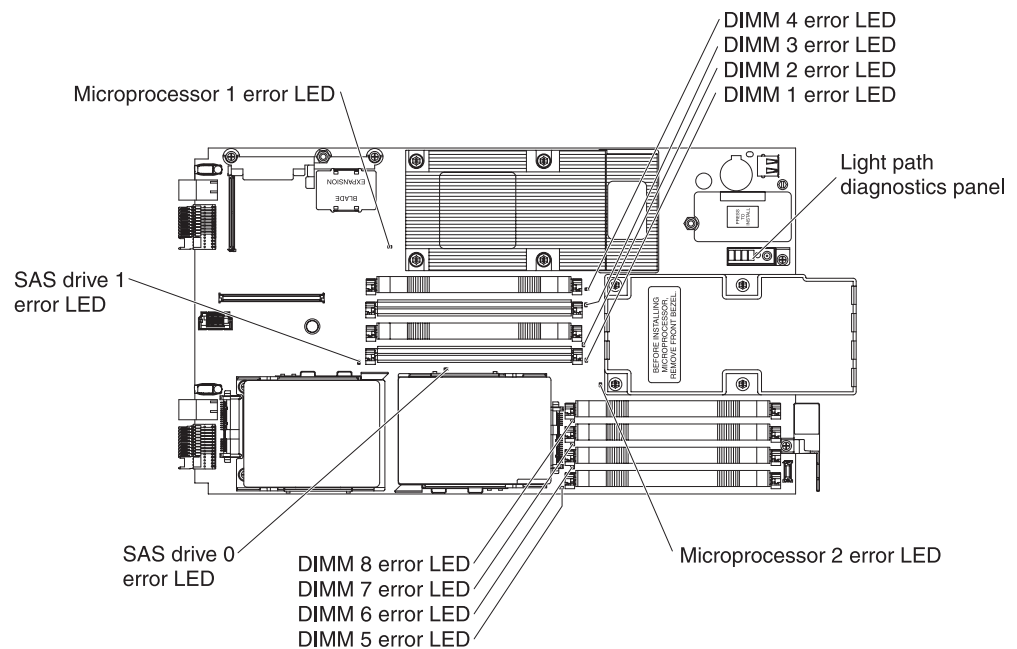


The following table defines the function of the light path diagnostics switch on the MPE unit.

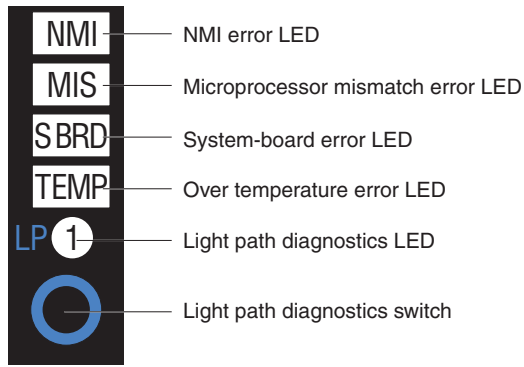
Switch number	Description
SW1	Light path diagnostics switch – Press and hold to relight the MPE-unit LEDs that were lit before you removed the blade server from the BladeCenter unit. Note: The LEDs on the system board can be lit for a maximum of two minutes.

System board LEDs

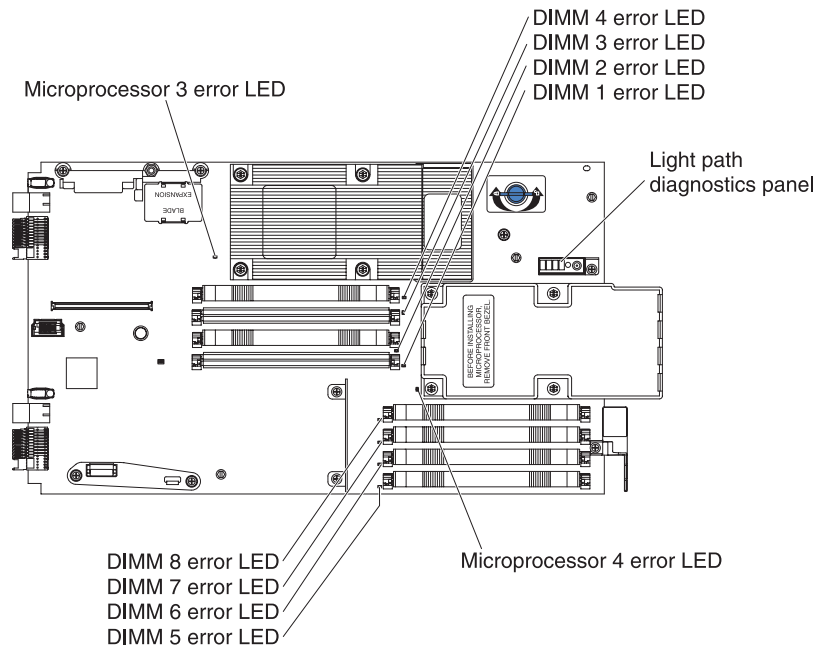
The following illustration shows the LEDs on the blade server system board. To see these LEDs, remove the blade server from the BladeCenter unit, open the cover or remove any optional expansion units, and press the light path diagnostics switch to light any error LEDs that were lit during processing.



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



The following illustration shows the LEDs on the MPE unit. To see these LEDs, remove the blade server from the BladeCenter unit, open the cover, and press the light path diagnostics switch to light any error LEDs that were lit during processing.



Chapter 2. Configuring the blade server

This chapter describes the configuration requirements of the blade server. Before you continue, make sure that the blade server has the latest version of firmware. For additional information, see “Firmware updates” on page 17.

The following configuration programs come with the blade server:

- **Setup Utility program**

The 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 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 SAS controller IDs. See “Using the LSI Logic Configuration Utility program” on page 18 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 14.

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

The PXE boot agent utility program is part of the BIOS code in the blade server. 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 16.

The IBM Remote Deployment Manager (RDM) Version 4.4 program is available for purchase. You can use IBM RDM 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 if an operating system supports the RDM program or for updated information about RDM and information about purchasing the software, see <http://www.ibm.com/systems/management/>.

Using the Setup Utility program

To start the Setup Utility program, complete the following steps:

1. Turn on the blade server (see “Turning on the blade server” on page 5).
2. Immediately give the blade server control of the BladeCenter unit shared keyboard, video, and mouse ports.
 - If you are managing the blade server by using the BladeCenter system console, press the KVM select button on the blade server (see “Blade server controls and LEDs” on page 3 for information).
 - If you are managing the blade server from a remote location, see the *IBM BladeCenter Management Module User’s Guide*, *IBM BladeCenter Management Module Command-Line Interface Reference Guide*, or *IBM BladeCenter Serial over LAN Setup Guide* for information and instructions.
3. When the Setup utility message is displayed, press F1.
4. Follow the instructions on the screen.

Setup Utility program menu choices

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

- **System Summary**

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

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

- **Processor Summary**

Select this choice to view information about the microprocessors that are installed in the blade server.

- **USB Device Summary**

Select this choice to view information about the USB devices that are installed in the blade server.

- **System Information**

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

- **Product Data**

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

- **Devices and I/O Ports**

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

You can also enable or disable the integrated SAS and Ethernet controllers, all standard ports (such as serial), and the I/O-expansion card. **Enable** is the default setting for all controllers. If you disable a device, it cannot be configured, and the operating system will not be able to detect it (this is equivalent to disconnecting the device). If you disable the Ethernet controller, the blade server will have no Ethernet capability.

- **Remote Console Redirection**

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

- **Video**

Select this choice to view information about the integrated video controller.

- **System MAC Addresses**

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

- **Date and Time**

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

- **System Security**

Select this choice to set a power-on password. See “Using passwords” on page 14 for more information about passwords.

- **Start Options**

Select this choice to view or change the start options. Changes in the start options take effect when you start the blade server.

- **Startup Sequence Options**

Select this choice to view or change the startup device sequence that is set for the blade server.

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

You can enable or disable the PXE option for either of the integrated Gigabit Ethernet controllers. If the MPE unit is installed, you can enable or disable the PXE option for either of its integrated Gigabit Ethernet controllers. The default setting for **Planar Ethernet 1** and **Planar Ethernet 2** is enabled, and if the MPE is installed, the default setting for **Planar Ethernet 3** and **Planar Ethernet 4** is disabled.

You can enable USB disk support, which enables the blade server to use a USB storage device that is connected to the USB port in the media tray of the BladeCenter unit. See the documentation for your BladeCenter unit for additional information.

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

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

- **Advanced Setup**

Select this choice to change settings for advanced hardware features.

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

- **Memory Settings**

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

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

- **PCI Bus Control**

Select this choice to view and set interrupts for PCI devices, enable or disable PCI ROM control, and to configure the master-latency-timer value for the blade server.

- **Baseboard Management Controller (BMC) Settings**

Select this choice to enable or disable the **Reboot on System NMI** option on the menu. If you enable this option, the blade server will automatically restart 60 seconds after the service processor issues a nonmaskable interrupt (NMI) to the blade server. You can also select this choice to enable or disable and set the timeouts for the POST and OS loader watchdog timers.

- **BMC Network Configuration**

Select this choice to set the network addresses of the BMC.

- **BMC System Event Log**

Select this choice to view and clear BMC event log entries.

- **Save Settings**

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

- **Restore Settings**
Select this choice to cancel the changes that you have made in the settings and restore the previous settings.
- **Load Default Settings**
Select this choice to cancel the changes that you have made in the settings and restore the factory settings.
- **Exit Setup**
Select this choice to exit from the Setup Utility program. If you have not saved the changes that you have made in the settings, you are asked whether you want to save the changes or exit without saving them.

Using passwords

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 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 by removing the blade server battery and then reinstalling it (see "Removing the battery" on page 48 and "Installing the battery" on page 48), or by using the power-on password override switch (see "System-board switches" on page 8).

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 has the following features to make setup easier:

- An easy-to-use interface
- Diskette-free setup and configuration programs that are based on detected hardware
- 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

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

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

The ServerGuide program has the following features:

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

Setup and configuration overview

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

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

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

1. After you have completed the setup process, the operating-system installation program starts. (You will need 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

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 LS22** or **BladeCenter LS42**.
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 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.

Note:

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 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

IBM periodically makes BIOS, service processor (BMC), diagnostic firmware, and other firmware updates available for the blade server. Go to <http://www.ibm.com/bladeCenter/> to download the latest firmware for the blade server; then, install any updates using the instructions that are included with the downloaded file.

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

Configuring 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. Click **Support**.
3. Under **Support information**, click **Product support and information**.
4. Under **Popular links**, click **Publications lookup**.
5. From the **Product family** menu, select **BladeCenter LS22** or **BladeCenter LS42** and click **Go**.

Note: If an 1801 error code is displayed during startup and the startup process stops, the BIOS is trying to copy too much data from the device boot ROM into write-protected RAM. To correct an 1801 error that halts the boot process, restart the blade server, start the Setup Utility program (see "Using the Setup Utility program" on page 11), and disable unnecessary ROM shadowing. Only the device boot ROMs that enable the following components must be shadowed during startup:

- Video
- Hard disk drive (if you are using this as a primary or secondary boot device)
- PXE (if you are using PXE as a primary or secondary boot device)
- One Ethernet controller (if you are using PXE as a primary or secondary boot device)

The remaining options and components will be enabled by device drivers in the operating system.

Configuring a SAS RAID array

Two SAS drives can be used to implement and manage RAID level-0 (striping) or RAID level-1 (mirror) arrays in operating systems that are listed at <http://www.ibm.com/servers/eserver/serverproven/compat/us/>. For more information, see the *Installation and User's Guide*.

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

Use the LSI Configuration Utility program to configure the SAS RAID (see "Using the LSI Logic Configuration Utility program").

Using 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 (see "Turning on the blade server" on page 5).
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.

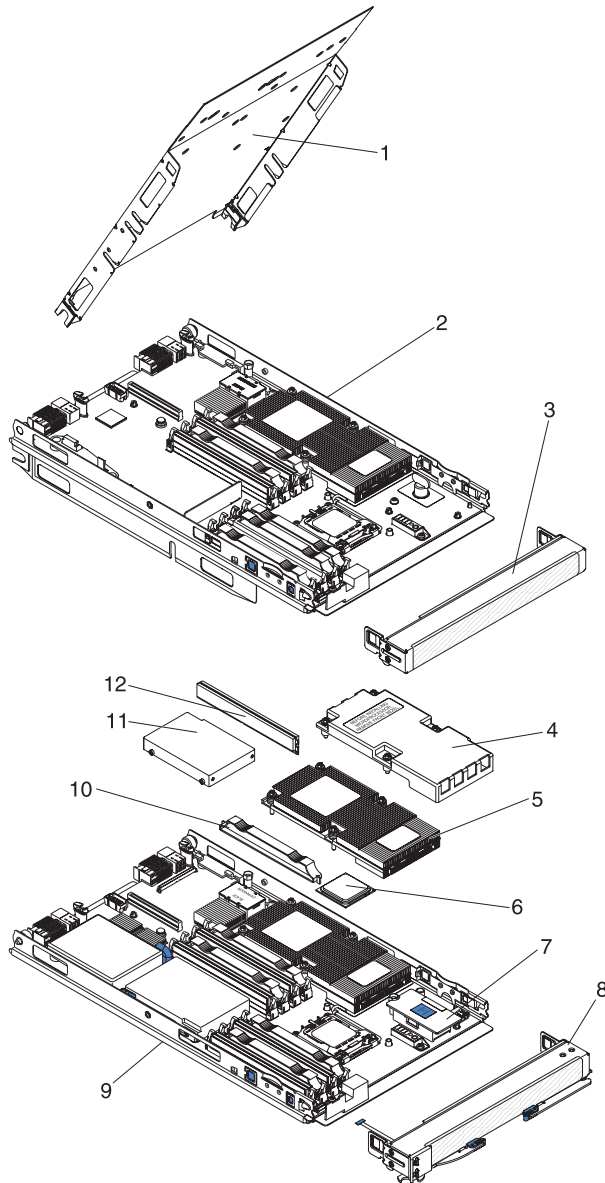
Chapter 3. Parts listing, Types 7901 and 7902

The following replaceable components are available for the IBM BladeCenter LS22 Type 7901 and LS42 Type 7902 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 **Part documents lookup**.
4. From the **Product Family** menu, select **BladeCenter LS22** or **BladeCenter LS42**, and click **Continue**.

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



Replaceable components are of four types:

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

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

Table 1. Customer and field replaceable units, Type 7901 and Type 7902

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
1	Cover (all models)	46C7201		
2	MPE board assembly (type 7902 models 3Qx, CQx, EDx, EMx, EUx, HVx, JVx)			46M6832
3	Bezel, MPE unit (type 7902 models 3Qx, CQx, EUx, EMx, HVx, JVx)	40K5904		
4	Filler, microprocessor heat sink (all models)	40K5929		
5	Heat sink, microprocessor (all models)			40K5895
6	Microprocessor, quad-core Opteron 2384, 2.7 GHz, 115W (type 7901 model 3Sx)			46M6806
6	Microprocessor, quad-core Opteron 8384, 2.7 GHz, 115W (type 7902 models 3Sx, ESx, EUx, HVx, JVx)			46M6815
6	Microprocessor, quad-core Opteron 8380, 2.5 GHz, 115W (type 7902 model 1Sx)			46M6811
6	Microprocessor, quad-core Opteron 2356, 2.3 GHz, 115W (type 7901 models CQx, EDx)			44R4959
6	Microprocessor, quad-core Opteron 8356, 2.3 GHz, 115W (type 7902 models CQx, EDx)			44R4969
6	Microprocessor, quad-core Opteron 2347 HE, 1.9 GHz, 79W (type 7901 model 3Qx)			44X1540
6	Microprocessor, quad-core Opteron 8347 HE, 1.9 GHz, 79W (type 7902 model 3Qx)			44X1550
6	Microprocessor, quad-core Opteron 2376 HE, 2.3 GHz, 79 W (type 7901 model 3Lx)			46M6878
6	Microprocessor, quad-core Opteron 8374 HE, 2.2 GHz, 79 W (option)			46M6883
6	Microprocessor, quad-core Opteron 2435 HE, 2.6 GHz, 115 W (type 7901 model 62x)			49Y7198
6	Microprocessor, quad-core Opteron 8431 HE, 2.4 GHz, 115 W (type 7902 models 61x)			49Y7199
6	Microprocessor, quad-core Opteron 8335 HE, 2.6 GHz, 115 W (type 7902 model 62x)			49Y7200
6	Microprocessor, quad-core Opteron 8376 HE, 2.3 GHz, 79 W (type 7902 models 3Lx, ELx, EMx)			46M6888
7	LS22 optimizer (type 7901 models 3Lx, 3Qx, 3Sx, 62x, CQx, EDx) (type 7902 models 1Sx, 3Lx, 3Sx, 61x, 62x, ELx, ESx)	44R4915		
8	Bezel assembly, blade server (type 7901 models 3Lx, 3Qx, 3Sx, 62x, CQx, EDx)	43W9877		
8	Bezel assembly, blade server (type 7902 models 1Sx, 3Lx, 3Qx, 3Sx, 61x, 62x, CQx, EDx, ELx, EMx, ESx, EUx, HVx JVx)	43W9882		
9	System-board assembly (all models)			49Y4790
10	Filler, DIMM (all models)	40K5989		
11	Solid state drive, 15.8 GB SAS (option)	43W7617		
11	Solid state drive, 32.8 GB SAS (option)	43W7621		
11	Hard disk drive, 73 GB SAS (option)	43X0847		

Table 1. Customer and field replaceable units, Type 7901 and Type 7902 (continued)

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
11	Hard disk drive, 73.4 GB SAS (option)	26K5779		
11	Hard disk drive, 146.8 GB SAS (option)	42D0422		
12	Memory, 1 GB PC2-5300, VLP (type 7901 models 3Lx, 3Qx, 3Sx, 62x, CQx) (type 7902 models 1Sx, 3Lx, 3Qx, 3Sx, 61x, 62x, CQx)	46C0523		
12	Memory, 2 GB PC2-5300, VLP (models type 7901 model EDx) (type 7902 models EDx, ELx, EMx, ESx, EUx, HVx, JVx)	46C0518		
12	Memory, 4 GB PC2-5300, VLP (option)	46C7522		
12	Memory, 4 GB PC2-6400, VLP (option)	46C7523		
12	Memory, 8 GB PC2-5300, VLP (option)	44T1546		
	Alcohol wipe (all models)	59P4739		
	Broadcom 2–port 10 GB ethernet CFFH NIC daughter card (type 7902 models HVx, JVx)			44W4469
	Concurrent KVM expansion card (option)	13N0842		
	Cisco 4X InfiniBand Host Channel Adapter expansion card (option)	32R1763		
	Cisco Systems InfiniBand HCA expansion card (option)	32R1899		
	Dust cover, microprocessor (all models)	40K5936		
	Emulex 4 Gb SFF Fibre Channel expansion card (option)	39Y9184		
	Emulex 4 Gb CFFv fibre channel expansion card (option)	43W6862		
	Ethernet expansion card (CFFv) (option)	46M6189		
	Ethernet expansion card (option)	43W4454		
	Filler, hard disk drive (all models)	40K5928		
	IBM Bladecenter PCI Express I/O expansion unit (BPE-3) (option)	44W4390		
	IBM BladeCenter storage and I/O expansion blade (option)	40K1739		
	IBM Gigabit Ethernet expansion card (option)	39M4630		
	IBM ServeRAID 8k-l SAS Controller expansion card (option)	25R8079		
	IBM ServeRAID 8k SAS Controller expansion card (option)	25R8076		
	IBM USB key for VMware ESXi (type 7901 model CTO) (type 7902 model HVx)	42D0545		
	InfiniBand 4X DDR CFF expansion (option)	43W4425		
	Infiniband 4X high-speed expansion card (option)	32R1763		

Table 1. Customer and field replaceable units, Type 7901 and Type 7902 (continued)

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
	Kit, miscellaneous parts (all models) <ul style="list-style-type: none"> • 2 socket alignment pins • 1 CPU socket protective cover • 4 HSDC support pins • 2 HSDC support studs • 2 SFF HSDC brackets • 2 CFF HSDC brackets • 2 alignment pins • 6 HSDC M3x6 screws • 20 3.5x5 screws • 1 DIMM air baffle 	44X2229		
	Label, FRU list (all models)	44X2228		
	Label, system service (all models)	44X2227		
	Myrinet expansion card (option)	32R1845		
	Myrinet card (option)	32R1845		
	PCI I/O expansion unit (PEU-2) (option)	44W4403		
	PCI I/O expansion unit 3e card (option)	43W4390		
	QLogic 4 Gb Standard Fibre (option)	26R0889		
	QLogic iSCSI expansion card (option)	49Y4236		
	QLogic (CFFh) Ethernet and 4 Gb Fibre Channel Expansion Card (option)	39Y9304		
	QLogic (CFFv) 4 Gb Fibre Channel Expansion (option)	41Y8525		
	QLogic (SFF) 4 Gb Fibre Channel (option)	26R0893		
	Microsoft Windows Server 2008 Datacenter 32/64 bit, Multilingual			49Y0222
	Microsoft Windows Server 2008 Datacenter 32/64 bit, Simplified Chinese			49Y0223
	Microsoft Windows Server 2008 Datacenter 32/64 bit, Traditional Chinese			49Y0224
	Microsoft Windows Server 2008 Standard Edition 32/64 bit 1-4 microprocessors, Multilingual			49Y0892
	Microsoft Windows Server 2008 Standard Edition 32/64 bit 1-4 microprocessors, Simplified Chinese			49Y0893
	Microsoft Windows Server 2008 Standard Edition 32/64 bit 1-4 microprocessors, Traditional Chinese			49Y0894
	Microsoft Windows Server 2008 Enterprise Edition 32/64 bit 1-8 microprocessors, Multilingual			49Y0895
	Microsoft Windows Server 2008 Enterprise Edition 32/64 bit 1-8 microprocessors, Simplified Chinese			49Y0896
	Microsoft Windows Server 2008 Enterprise Edition 32/64 bit 1-8 microprocessors, Traditional Chinese			49Y0897
	VMware ESX Server 3i version 3.5			46D0762
	VMware ESX Server 3i version 3.5 update 2			46M9236

Table 1. Customer and field replaceable units, Type 7901 and Type 7902 (continued)

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	FRU part number
	VMware ESX Server 3i version 3.5 update 3			46M9237
	SAS (CFFv) expansion card (option)	39Y9188		
	SFF Fibre Channel expansion card (option)	26K4859		
	SFF Gigabit Ethernet expansion card (option)	46M5963		
	Tray, SAS hard disk drive (all models)	31R2239		
	VMware ESX Server 3i version 3.5	46D0762		
	VMware ESX Server 3i version 3.5 update 2	46M9236		
	VMware ESX Server 3i version 3.5 update 3	46M9237		
	VMware ESX Server 3i version 3.5 update 4	46M9238		
	Microsoft Windows Server 2008 Datacenter 32/64 Bit, Multilingual	49Y0222		
	Microsoft Windows Server 2008 Datacenter 32/64 Bit, Simplified Chinese	49Y0223		
	Microsoft Windows Server 2008 Datacenter 32/64 Bit, Traditional Chinese	49Y0224		
	Windows Server 2008 Standard Edition 32/64 Bit (1-4 Processors), Multilingual	49Y0892		
	Windows Server 2008 Standard Edition 32/64 Bit (1-4 Processors), Simplified Chinese	49Y0893		
	Windows Server 2008 Standard Edition 32/64 Bit (1-4 Processors), Traditional Chinese	49Y0894		
	Windows Server 2008 Enterprise Edition 32/64 Bit (1-8 Processors), Multilingual	49Y0895		
	Windows Server 2008 Enterprise Edition 32/64 Bit (1-8 Processors), Simplified Chinese	49Y0896		
	Windows Server 2008 Enterprise Edition 32/64 Bit (1-8 Processors), Traditional Chinese	49Y0897		

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

Table 2. Consumable parts, Type 7901 and Type 7902

Description	Part number
Battery, 3.0 volt	43W9859

To order a consumable part, complete the following steps:

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

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

Chapter 4. Removing and replacing blade server components

Replaceable components are of four types:

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

See Chapter 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine whether a component is a Tier 1 CRU, Tier 2 CRU, or FRU.

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

Installation guidelines

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

- Read the safety information that begins on page “Safety statements” on page viii and the guidelines in “Handling static-sensitive devices” on page 26. 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 make sure 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:

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/bladecenter/>.
2. Click **Support**.
3. Under **Support information**, click **Product support and information**.
4. Under **Popular links**, click **Publications lookup**.
5. From the **Product family** menu, select **BladeCenter LS22** or **BladeCenter LS42** and click **Go**.

Download and install the latest firmware for the management module installed in your BladeCenter unit (see the documentation for your management module).

- Observe good housekeeping in the area where you are working. Put 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 hot-swap blade server from the BladeCenter unit, you must shut down the operating system and turn off the blade server. You do not have to shut down the BladeCenter unit itself.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the blade server, or open or close a latch.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that you can remove or install the component while the BladeCenter unit 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.
- When you are finished working on the blade server, reinstall all safety shields, guards, labels, and ground wires.
- For a list of supported optional devices for the blade server, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

System reliability guidelines

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

- Each microprocessor socket always contains either a microprocessor dust cover and heat sink filler or a microprocessor and heat sink. If the blade server has only one microprocessor, it must be installed in microprocessor socket 1.
- Do not operate the BladeCenter unit without a blade server, expansion unit, or filler installed in each blade bay. See the documentation for your BladeCenter unit for additional information.
- Make sure that the ventilation holes on the blade server are not blocked.
- The blade server battery must be operational. If the battery becomes defective, replace it immediately. For instructions, see the *Problem Determination and Service Guide*.

Handling static-sensitive devices

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

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

- 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.

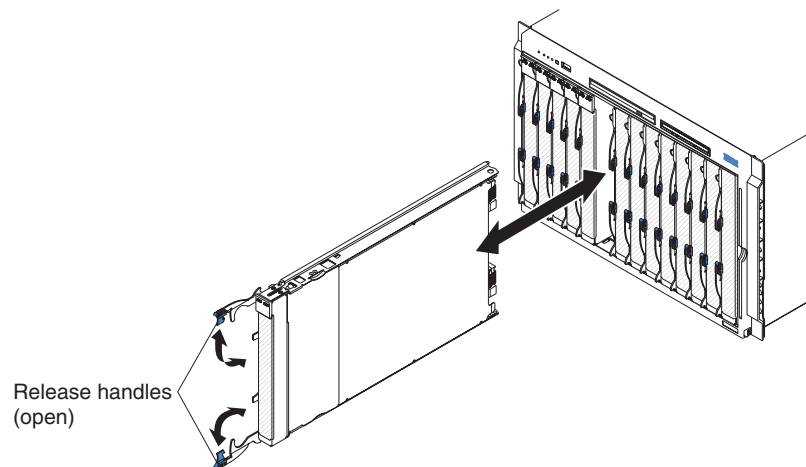
- Remove the device from its package and install it directly into the blade server without setting it down. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the blade server cover or on a metal surface.
- Take additional care when you handle devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Returning a device or component

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

Removing the blade server from a BladeCenter unit

The following illustration shows how to remove an LS22 Type 7901 blade server from a Type 8677 BladeCenter unit. The procedure for removing the LS42 Type 7902 blade server and MPE is the same. 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 installed in each blade bay.
- When you remove the blade server, note the bay number. Reinstalling a blade server into a different bay from the one it was removed from might have unintended consequences. Some configuration information and update options are established according to bay number; if you reinstall the blade server into a different bay, you might have to reconfigure the blade server.

To remove the blade server, complete the following steps:

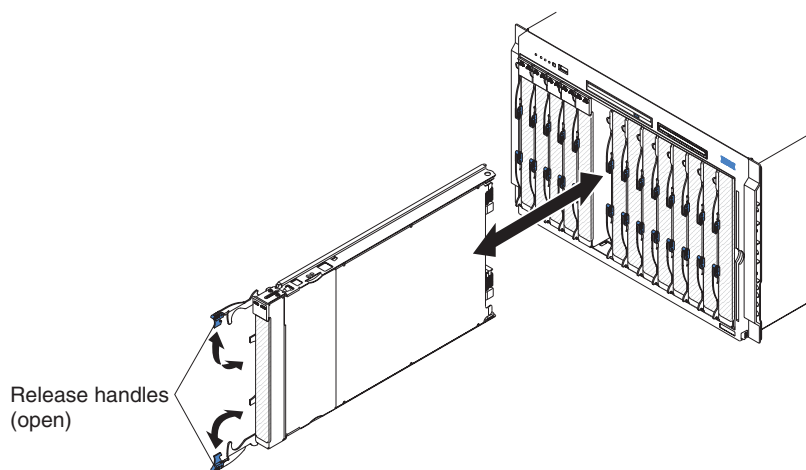
1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is operating, shut down the operating system.
3. Press the power-control button (behind the blade server control panel door) to turn off the blade server (see “Turning off the blade server” on page 6 for more information).

Attention: Wait at least 30 seconds, until the hard disk drives stop spinning, before you proceed to the next step. The activity LED on the control panel turns off when the hard disk drive has stopped spinning (see “Blade server controls and LEDs” on page 3).

4. Pull the two release handles to the open position. The blade server moves out of the bay approximately 0.6 cm (0.25 inch).
5. Pull the blade server out of the bay.
6. Place either a blade filler or another blade server in the bay within 1 minute.

Installing the blade server in a BladeCenter unit

The following illustration shows how to install a single-width type of blade server into a Type 8677 BladeCenter unit. The procedure for installing the double-width type of blade server is the same. 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. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If you installed a blade filler or another blade server in the bay from which you removed the blade server, remove it from the bay.

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

3. Make sure that the release levers on the blade server are in the open position (perpendicular to the blade server).
4. Slide the blade server into the blade bay until it stops.
5. Push the release levers on the front of the blade server to the closed position.
6. Turn on the blade server (see “Turning on the blade server” on page 5).
7. Make sure that the power-on LED on the blade server control panel is lit continuously, indicating that the blade server is receiving power and is turned on.
8. Optional: Write identifying information on one of the labels that come with the blade servers and place the label on the BladeCenter unit bezel. See the documentation for your BladeCenter unit for information about the label placement.

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

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

If you have changed the configuration of the blade server or if you are installing a different blade server from the one that you removed, you must configure the blade server through the Setup Utility program, 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 consumable parts and Tier 1 CRUs

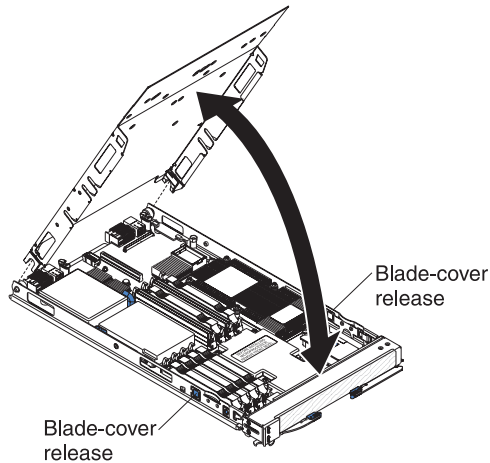
Replacement of consumable parts and Tier 1 CRUs are your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

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

Removing the blade server cover

Note: If the blade server has an expansion unit that does not have a removable cover, remove the expansion unit (see “Removing an expansion unit” on page 31).

The following illustration shows how to remove the cover from a single-width model blade server; removing the cover from a double-width model blade server is similar.

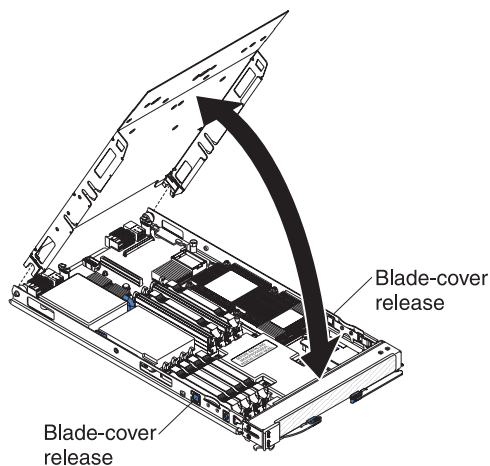


To remove the blade server cover, complete the following steps.

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Carefully lay the blade server down on a flat, static-protective surface, with the cover side up.
4. Press the blade-cover release on each side of the blade server or expansion unit and lift the cover open.
5. Lift the cover from the blade server and store it for future use.
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

The following illustration shows how to install the cover on a single-width model blade server; installing the cover on a double-width model blade server is similar.



Statement 21



CAUTION:

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

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

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

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If you removed the bezel assembly, install it (see “Installing the bezel assembly” on page 34 for instructions).
3. If you removed an expansion unit from a double-width type blade server, install it (see “Installing an expansion unit” on page 32 for instructions).
4. Lower the cover so that the slots at the rear slide down onto the pins at the rear of the blade server. Before closing the cover, check that all components are installed and seated correctly and that you have not left loose tools or parts inside the blade server.
5. Pivot the cover to the closed position, as shown in the illustration, until it clicks into place.

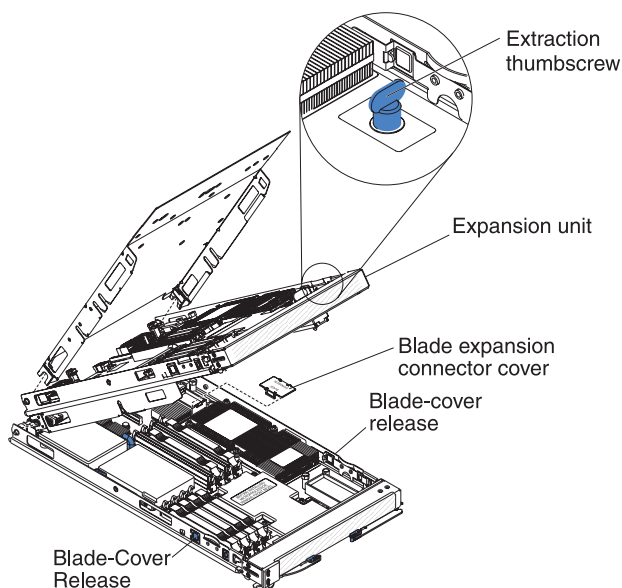
Note: Do not allow the control-panel cable to become caught between the cover and the bezel assembly or air baffle.

6. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

Removing an expansion unit

To remove an expansion unit, complete the following steps.

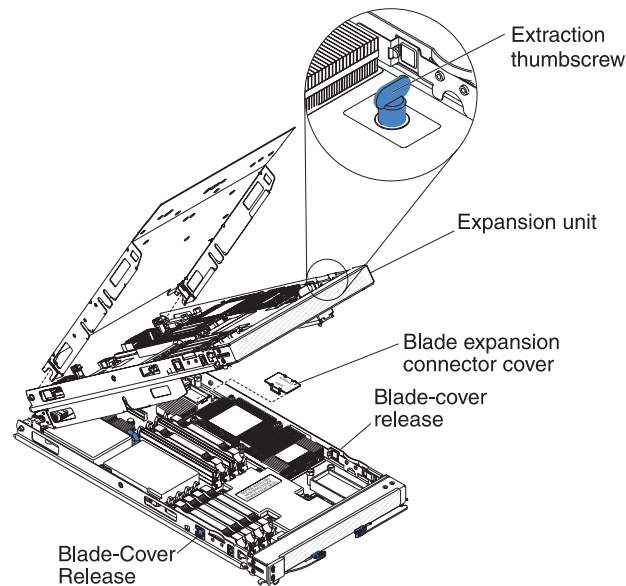
Note: The following illustration shows how to remove a Multiprocessor Expansion (MPE) unit from the blade server; removing another type of expansion unit from a blade server is similar.



1. Read the safety information beginning on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Carefully lay the blade server down on a flat, static-protective surface, with the cover side up.
4. Remove the blade server cover, if one is installed (see “Removing the blade server cover” on page 29).
5. If the expansion unit has an extraction device (such as a thumbscrew or a lever), use it to disengage the expansion unit from the blade server; otherwise, press the blade-cover release on each side of the blade server to disengage the expansion unit from the blade server.
Attention: Do not rotate the expansion unit open further than 90° to avoid damage to the connectors at the rear of the blade server.
6. Rotate the expansion unit open; then, lift the expansion unit from the blade server.
7. If you are not installing an expansion unit immediately, make sure that the protective covers are installed on the blade expansion connector and the MPE unit connector.
8. If you are instructed to return the expansion unit, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing an expansion unit

The following illustration shows how to install a Multiprocessor Expansion (MPE) unit on the blade server; installing another type of expansion unit on a blade server is similar.

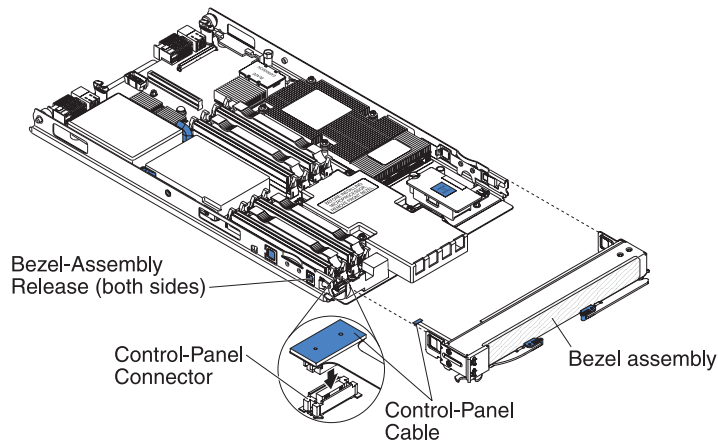


To install an expansion unit, complete the following steps.

1. Remove the cover from the blade expansion connector, if one is installed.
Attention: If a high-speed expansion card is installed in the blade server system board, you cannot install an expansion unit until the high-speed expansion card is removed. A high-speed expansion card can only be installed in the MPE in double-wide blade configurations. For more information see “Installing an I/O expansion card” on page 43.
2. If a blade-expansion-connector cover is installed in the blade server, remove it (see “System-board connectors” on page 7).
3. Touch the static-protective package that contains the expansion unit to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion unit from the package.
4. Orient the expansion unit above the blade server.
5. Lower the expansion unit so that the slots at the rear slide down onto the cover pins at the rear of the blade server; then, pivot the expansion unit down onto the blade server.
6. If the expansion unit has an extraction device (such as a thumbscrew or a lever), use it to fully engage the expansion unit on the blade server; otherwise, press the expansion unit firmly into the closed position until it clicks into place.
7. Install the blade-server cover on the expansion unit, if required (see “Installing the blade server cover” on page 30).
8. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

Removing the bezel assembly

The following illustration shows how to remove the bezel assembly from the blade server; removing the bezel assembly from the MPE unit is similar.

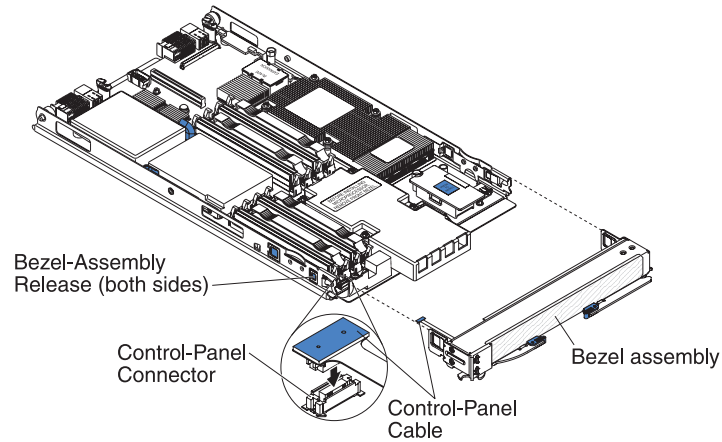


To remove the bezel assembly, complete the following steps.

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. Remove the blade server cover (see “Removing the blade server cover” on page 29).
3. If you are removing the bezel assembly from the blade server and an MPE unit or expansion unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
4. Press the bezel-assembly release on each side of the blade server and pull the bezel assembly away from the blade server approximately 1.2 cm (0.5 inch).
5. If you are removing the bezel assembly from a blade server, disconnect the control-panel cable from the control-panel connector by lifting up on the control-panel cable. If you are removing a bezel assembly on an MPE unit, go to step 6.
6. Pull the bezel assembly away from the blade server.
7. 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; otherwise, store the bezel assembly in a safe place.

Installing the bezel assembly

The following illustration shows how to install the bezel assembly on the blade server; installing the bezel assembly on the MPE unit is similar.



To install the bezel assembly, complete the following steps.

1. If you are installing the bezel assembly on a blade server, connect the control-panel cable to the control-panel connector. If you are installing a bezel assembly on an MPE unit, go to step 2.

Note: Align the control-panel cable with the notch in the air baffle on the blade server in front of the control-panel connector.

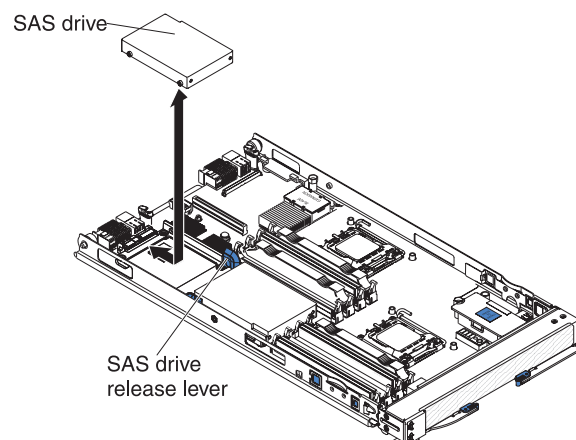
2. Carefully slide the bezel assembly onto the blade server until it clicks into place.

Note: Do not allow the control-panel cable to become caught between the bezel assembly and the air baffle or blade server chassis.

3. Install the MPE unit or expansion unit, if you removed one while removing the bezel assembly (see “Installing an expansion unit” on page 32).
4. Install the cover onto the blade server (see “Installing the blade server cover” on page 30).
5. Install the blade server into the BladeCenter (see “Installing the blade server in a BladeCenter unit” on page 28).

Removing a SAS drive

The following illustration shows how to remove a SAS drive from the blade server.

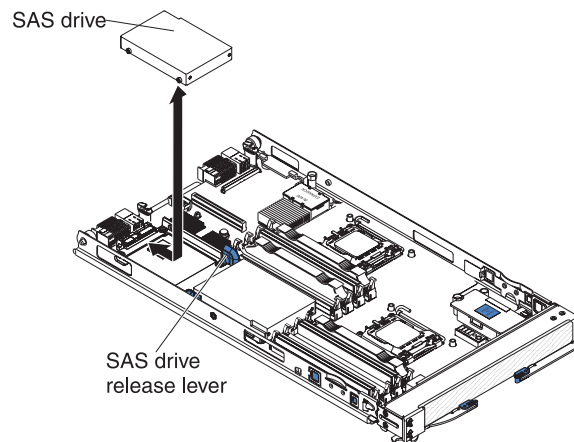


To remove a SAS drive, complete the following steps.

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. If you are removing a drive from the blade server and an MPE unit or expansion unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
5. Press the release lever away from the SAS drive; then, remove the SAS drive.
Attention: If two SAS drives are installed, you might damage one or both of the drives if you use too much force to remove the drive.
 - If you are removing a SAS drive from SAS connector 0, slide the drive backward to disengage it from the connector at the front of the drive tray; then, lift the drive out of the drive tray.
 - If you are removing a SAS drive from SAS connector 1, slide the drive forward to disengage it from the connector at the rear of the drive tray then, lift the drive out of the drive tray.
6. If you are instructed to return the drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a SAS drive

The following illustration shows how to install the SAS drive in the blade server.



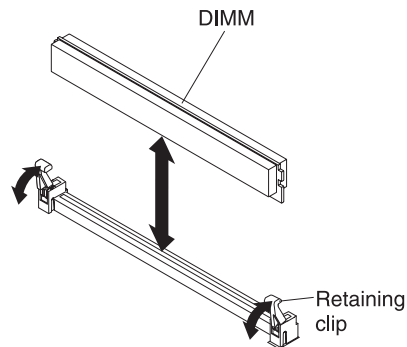
To install a SAS drive, complete the following steps.

1. Touch the static-protective package that contains the hard disk drive to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the hard disk drive from the package.
Attention: Do not press on the top of the drive. Pressing the top might damage the drive.
2. Place the hard disk drive into the drive tray and push it into the connector at the end of the drive tray, until the drive moves past the lever at the front of the tray.

3. Install the MPE unit or expansion unit, if you removed one while you removed the SAS drive (see “Installing an expansion unit” on page 32).
4. Install the blade server cover (see “Installing the blade server cover” on page 30).
5. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

Removing a memory module

The following illustration shows how to remove a DIMM from the blade server or the MPE unit.



To remove a DIMM, complete the following steps.

1. Read the safety information that begins “Safety statements” on page viii and “Installation guidelines” on page 25
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. If you are removing a DIMM from the blade server and an MPE unit or expansion unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
5. Locate the DIMM connectors (see “System-board connectors” on page 7). Determine which DIMM you want to remove from the blade server.
Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.
6. Move the DIMM retaining clips on the side of the DIMM connector to the open position by pressing the retaining clips away from the microprocessor that is installed closest to the DIMM slots.
7. Using your fingers, pull the DIMM out of the DIMM connector.
Attention: A DIMM or DIMM filler must be installed in the DIMM connector before turning the blade server on (see “Installing a memory module” on page 38).
8. 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

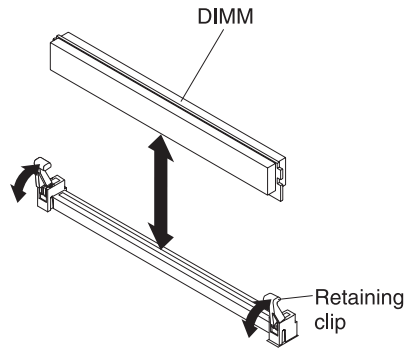
Note: If you are replacing a faulty DIMM, make sure that the replacement DIMM is the correct type of memory. For each installed microprocessor, a set of four DIMM connector is enabled (see the following table for more information). If you are adding DIMMs, install the DIMMs in pairs into the DIMM connectors that are enabled. See the *Installation and User's Guide* for additional information about the type of memory that is compatible with the server.

The following table lists the available microprocessor and DIMM combinations for the blade server and MPE.

Note: Only the BladeCenter LS42 (Type 7902) with an MPE installed can support more than two microprocessors.

Number of micro-processors	Blade server								MPE							
	DIMM connector								DIMM connector							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1 (in blade server)	X		X													
	X	X	X	X												
2 (in blade server)	X		X													
	X		X		X		X									
	X	X	X	X	X		X									
	X	X	X	X	X	X	X	X								
3 (2 in blade server, 1 in MPE unit)	X		X													
	X		X		X		X									
	X		X		X		X		X		X					
	X	X	X	X	X		X		X		X					
	X	X	X	X	X	X	X	X	X		X					
	X	X	X	X	X	X	X	X	X	X	X	X				
4 (2 in blade server, 2 in MPE unit)	X		X													
	X		X		X		X									
	X		X		X		X		X		X					
	X		X		X		X		X		X		X		X	
	X	X	X	X	X		X		X		X		X		X	
	X	X	X	X	X	X	X	X	X		X		X		X	
	X	X	X	X	X	X	X	X	X	X	X	X				
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The following illustration shows how to install a DIMM in the blade server or the MPE unit.



To install a DIMM, complete the following steps.

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. Read the documentation that comes with the DIMM.
3. Locate the DIMM connectors (see “System-board connectors” on page 7). Determine the connectors into which you will install the DIMMs.
4. Touch the static-protective package that contains the DIMM to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the DIMM from the package.
Attention: To avoid breaking the DIMM retaining clips or damaging the DIMM connectors, open and close the clips gently.
5. Make sure that both of the connector retaining clips are in the fully open position.
6. Turn the DIMM so that the DIMM keys align correctly with the connector on the system board.
7. Insert the DIMM by pressing the DIMM along the guides into the connector. Make sure that the retaining clips snap into the closed positions.
Attention: If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly installed. In this case, open the retaining clips and remove the DIMM; then, reinsert the DIMM.
8. Install the MPE unit or expansion unit, if one was removed while removing the DIMMs (see “Installing an expansion unit” on page 32).
9. Install the blade server cover (see “Installing the blade server cover” on page 30).
10. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

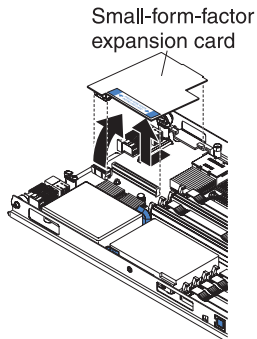
Removing an I/O expansion card

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

- Small-form-factor (SFF)
- Standard-form-factor
- High-speed (HSDC)
- Combination-form-factor which consists of the following two parts:
 - Combination-form-factor horizontal (CFFh)
 - Combination-form-factor vertical (CFFv)

Removing a small-form-factor expansion card

The following illustration shows how to remove a small-form-factor expansion card from the blade server; removing a small-form-factor expansion card from the MPE unit is similar.

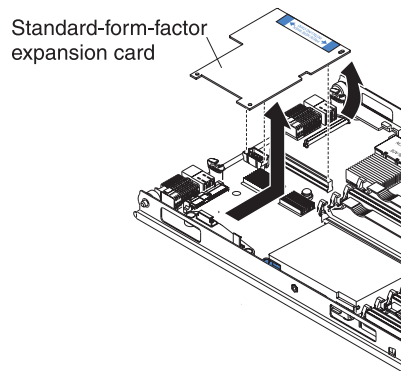


To remove a small-form-factor expansion card, complete the following steps.

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. If you are removing the expansion card from the blade server and an MPE unit or expansion unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
5. Gently pivot the wide end of the card out of the expansion card connectors; then, slide the notched end of the card out of the raised hook on the expansion card bracket and lift the card out of the blade server.
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.

Removing a standard-form-factor expansion card

The following illustration shows how to remove a standard-form-factor expansion card from the blade server; removing a standard-form-factor expansion card from the MPE unit is similar.

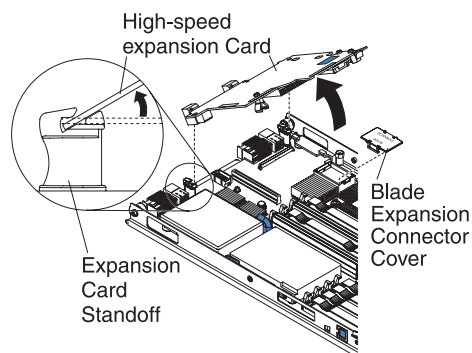


To remove a standard-form-factor expansion card, complete the following steps.

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. If you are removing the expansion card from the blade server and an MPE unit or expansion unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
5. Gently pivot the wide end of the card out of the expansion card connectors; then, slide the notched end of the card out of the raised hook on the expansion card bracket and lift the card out of the blade server.
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.

Removing a high-speed expansion card

The following illustration shows how to remove a high-speed expansion card from the blade server; removing a high-speed expansion card from the MPE unit is similar.



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

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.

2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. Rotate the expansion-card extraction lever upward to disengage the blade-expansion connector.
5. Pivot the narrow end of the card away from the blade expansion connector; then, slide the slots at the back end of the card out of the expansion-card standoffs and lift the card out of the blade server.
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.

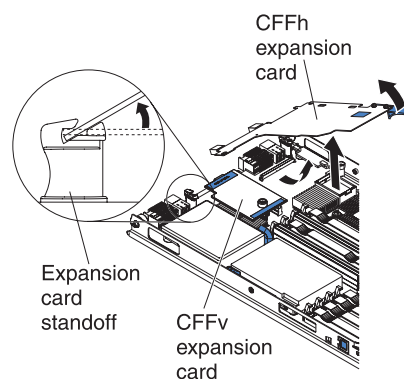
Removing a combination-form-factor expansion card

The combination-form-factor expansion card consists of two parts, the combination-form-factor vertical (CFFv) card and the combination-form-factor horizontal (CFFh) card.

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

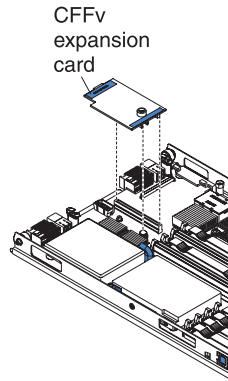
1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. Remove the CFFh card.

The following illustration shows how to remove a CFFh expansion card from the blade server; removing a combination-form-factor expansion card from an MPE unit is similar.



- a. Locate the CFFh card in the blade-expansion connector (see “System-board connectors” on page 7).
 - b. Pull up the release lever on the CFFh card until the card disconnects from the blade-expansion connector.
 - c. Pull the card toward the front of the blade server to remove it from the card retainer brackets.
5. Remove the CFFv card.

The following illustration shows how to remove a CFFv expansion card from the blade server; removing a combination-form-factor expansion card from an MPE unit is similar.



- a. Locate the CFFv card in the I/O-expansion card connector (see “System-board connectors” on page 7).
 - b. Pull up on the CFFv card to remove it from the expansion connector; then, 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 an I/O expansion card

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

- Small-form-factor (SFF)
- Standard-form-factor
- High-speed (HSDC)
- Combination-form-factor that includes the following two card types:
 - Combination-form-factor horizontal (CFFh)
 - Combination-form-factor vertical (CFFv)

The following table lists the combination of expansion cards that will work in the BladeCenter LS22 Type 7901 blade server and the single-width BladeCenter LS42 Type 7902 blade server.

Table 3. Expansion card combinations

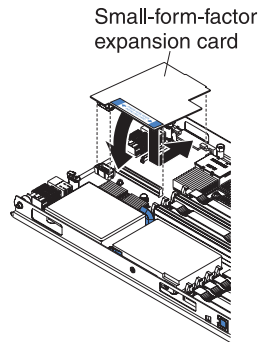
Blade-expansion Connector	I/O-expansion Connector	cKVM	HDD 0	HDD 1
HSDC		X	X	X
	Standard-form-factor expansion card	X	X	
	SFF	X	X	X
CFFh	CFFv	X	X	X

The following table lists the combination of expansion cards that will work in the BladeCenter LS42 Type 7902 blade server and MPE unit.

Blade-expansion connector (expansion unit)	I/O-expansion connector (expansion unit)	I/O-expansion connector (blade server)	cKVM (blade server)	SAS drive 0 (blade server)	SAS drive 1 (blade server)
HSDC		Standard-form-factor expansion card	X	X	
HSDC		SFF	X	X	X
HSDC		CFFv	X	X	X
	Standard-form-factor expansion card	Standard-form-factor expansion card	X	X	
	Standard-form-factor expansion card	SFF	X	X	X
	Standard-form-factor expansion card	CFFv	X	X	X
	SFF	Standard-form-factor expansion card	X	X	
	SFF	SFF	X	X	X
	SFF	CFFv	X	X	X
CFFh	CFFv	Standard-form-factor expansion card	X	X	
CFFh	CFFv	SFF	X	X	X
CFFh	CFFv	CFFv	X	X	X

Installing a small-form-factor expansion card

The following illustration shows how to install a small-form-factor expansion card in the blade server; installing a small-form-factor expansion card in the MPE unit is similar.



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

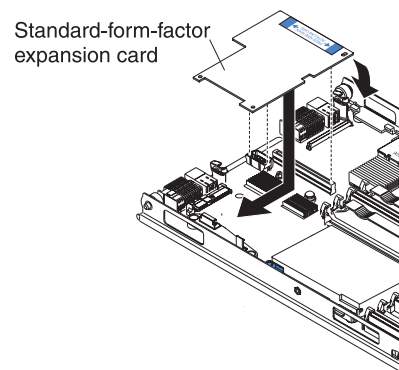
1. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion card from the package.
2. Orient the expansion card over the expansion-card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

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

4. Install the MPE unit or expansion unit, if you removed one while you removed the expansion card (see “Installing an expansion unit” on page 32).
5. Install the blade server cover (see “Installing the blade server cover” on page 30).
6. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

Installing a standard-form-factor expansion card

The following illustration shows how to install a standard-form-factor expansion card in the blade server; installing a standard-form-factor expansion card in the MPE unit is similar.



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

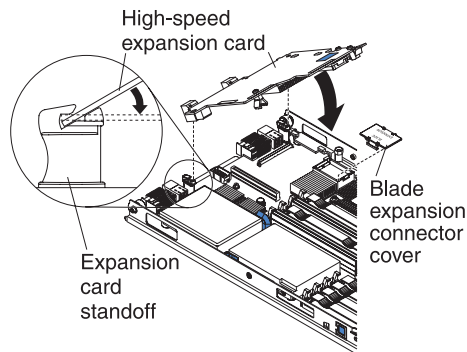
1. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion card from the package.
2. Orient the expansion card over the expansion card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

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

4. Install the MPE unit or expansion unit, if you removed one while you removed the expansion card (see “Installing an expansion unit” on page 32).
5. Install the blade server cover (see “Installing the blade server cover” on page 30).
6. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

Installing a high-speed expansion card

The following illustration shows how to install a high-speed expansion card in the blade server; installing a high-speed expansion card in the MPE unit is similar.



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

1. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion card from the package.
2. Locate the blade-expansion connector and orient the expansion card over it (see “System-board connectors” on page 7).
3. Slide the slots at the back end of the card onto the pins on the expansion card standoff; then, gently pivot the card into the blade expansion connector.
4. Firmly press on the indicated locations to seat the expansion card.

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

5. Install the blade server cover (see “Installing the blade server cover” on page 30).

6. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

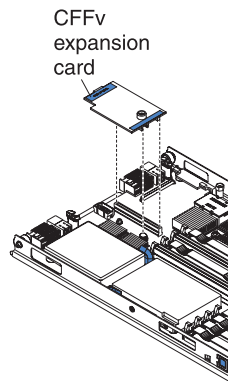
Installing a combination-form-factor expansion card

The combination-form-factor expansion card consists of two parts, the combination-form-factor vertical (CFFv) card and the combination-form-factor horizontal (CFFh) card.

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

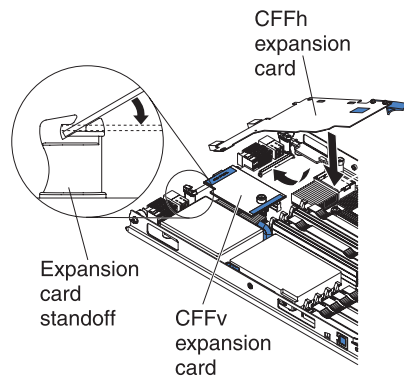
1. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion card from the package.
2. Install the CFFv card.

The following illustration shows how to install a CFFv expansion card in the blade server; installing a CFFv expansion card into an MPE unit is similar.



- a. Locate the I/O-expansion card connector (see “System-board connectors” on page 7).
 - b. Orient the CFFv card over the I/O-expansion card connector.
 - c. Press the CFFv card into the I/O-expansion card connector.
3. Install the CFFh card.

The following illustration shows how to install a CFFh expansion card in the blade server; installing a CFFh expansion card into an MPE unit is similar.

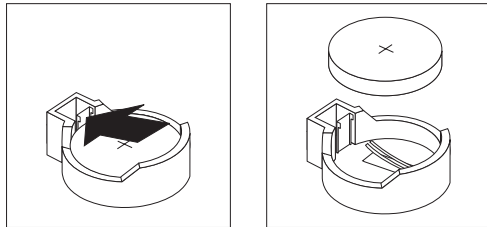


- a. Locate the blade-expansion connector (see “System-board connectors” on page 7).
- b. Orient the CFFh card with the blade-expansion connector.

- c. Tilt the CFFh card into the card retainer brackets towards the rear of the blade server.
- d. Press the CFFh card into the blade-expansion connector.

Removing the battery

The following illustration shows how to remove a battery from the blade server



To remove the battery, complete the following steps.

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. If an MPE unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
5. Locate the battery on the system board (see “System-board connectors” on page 7).
6. Use one finger to press the top of the battery clip away from the battery. The battery pops up when it is 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

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 server and reset the system date and time.
- To avoid possible danger, read and follow the following safety statement.

Statement 2



CAUTION:

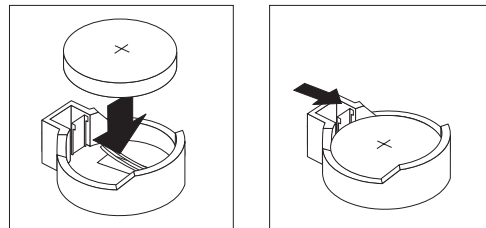
When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode 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.

The following illustration shows how to install a battery in the blade server

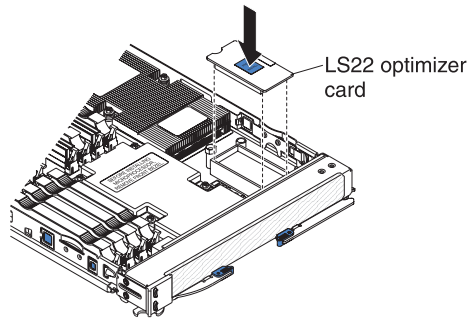


To install the battery, complete the following steps.

1. Follow any special handling and installation instructions that come with the battery.
2. Locate the battery connector on the system board (see “System-board connectors” on page 7).
3. Insert the battery:
 - a. Tilt the battery so that you can insert it into the socket on the side opposite the battery clip.
 - b. Press the battery down into the socket until it clicks into place. Make sure the battery clip holds the battery securely.
4. Install the MPE unit or expansion unit, if you removed one while you removed the battery (see “Installing an expansion unit” on page 32).
5. Install the blade server cover (see “Installing the blade server cover” on page 30).
6. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).
7. Turn on the blade server and run the Setup Utility program. Set configuration parameters as needed (see “Using the Setup Utility program” on page 11 for information).

Removing the LS22 optimizer

The following illustration shows how to remove the LS22 optimizer card from the blade server. The LS22 optimizer card is installed in the BladeCenter LS22 Type 7901 blade server and the single-width BladeCenter LS42 Type 7902 blade server.

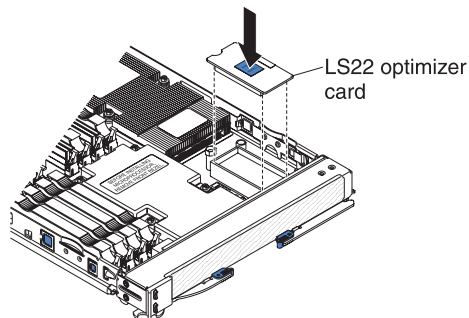


To remove the LS22 optimizer card, complete the following steps:

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. Locate the LS22 optimizer card on the system board (see “System-board connectors” on page 7).
5. Use your thumb and index finger to lift the LS22 optimizer card from the socket.
6. If you are instructed to return the LS22 optimizer card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the LS22 optimizer

The following illustration shows how to install the LS22 optimizer card from the blade server. The LS22 optimizer card is installed in the BladeCenter LS22 Type 7901 blade server and the single-width BladeCenter LS42 Type 7902 blade server.



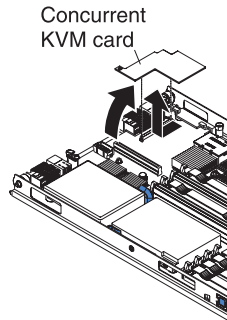
To install the LS22 optimizer, complete the following steps:

1. Follow any special handling and installation instructions that come with the LS22 optimizer.
2. Locate the LS22 optimizer connector on the system board (see “System-board connectors” on page 7).
3. Orient the LS22 optimizer card with the connector on the system board. The LS22 optimizer card is keyed and aligns with the notch in the connector.

4. Press the LS22 optimizer card down into the socket until it clicks into place.
5. Install the blade server cover (see “Installing the blade server cover” on page 30).
6. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

Removing a concurrent KVM feature card

The following illustration shows how to remove the concurrent KVM feature card from the blade server.

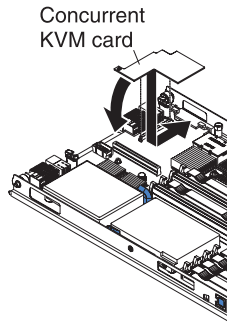


To remove a concurrent KVM feature card, complete the following steps:

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. If an MPE unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
5. If any of the following expansion cards are installed in the blade server, remove them:
 - Small-form-factor card (see “Removing a small-form-factor expansion card” on page 40)
 - Combination-form-factor card (see “Removing a combination-form-factor expansion card” on page 42)
 - High-speed expansion card (see “Removing a high-speed expansion card” on page 41)
6. Gently pivot the narrow end of the card out of the concurrent-KVM connector; 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 concurrent KVM feature card, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a concurrent KVM feature card

The following illustration shows how to install a concurrent KVM feature card in the blade server.



To install a concurrent KVM feature card, complete the following steps:

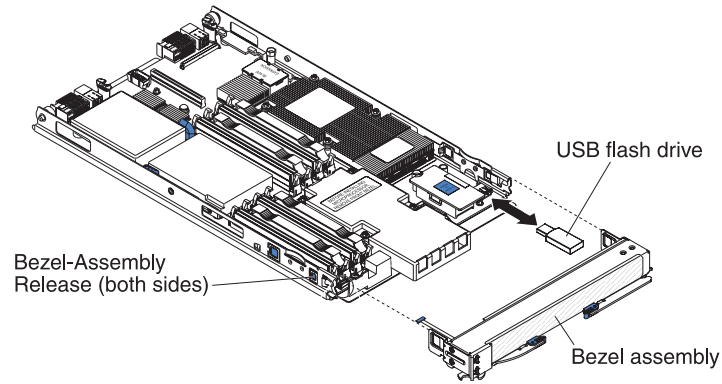
1. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component; then, remove the concurrent KVM feature card from the package.
2. Locate the concurrent-KVM connector and orient the concurrent KVM feature card over it.
3. Slide the right side of the card (the side of the card that is away from the concurrent-KVM connector) between the two tabs at the right side of the expansion card bracket; then, gently pivot the card into the connector.

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

4. If you removed any of the following expansion cards while you removed the concurrent KVM card, reinstall them:
 - Small-form-factor card (see “Installing a small-form-factor expansion card” on page 44).
 - Combination-form-factor card (see “Removing a combination-form-factor expansion card” on page 42)
 - High-speed expansion card (see “Removing a high-speed expansion card” on page 41)
5. Install the MPE unit or expansion unit, if you removed one while you removed the concurrent KVM card (see “Installing an expansion unit” on page 32).
6. Install the blade server cover (see “Installing the blade server cover” on page 30).
7. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

Removing a USB flash drive

The following illustration shows how to remove an embedded USB flash drive from the blade server system board.

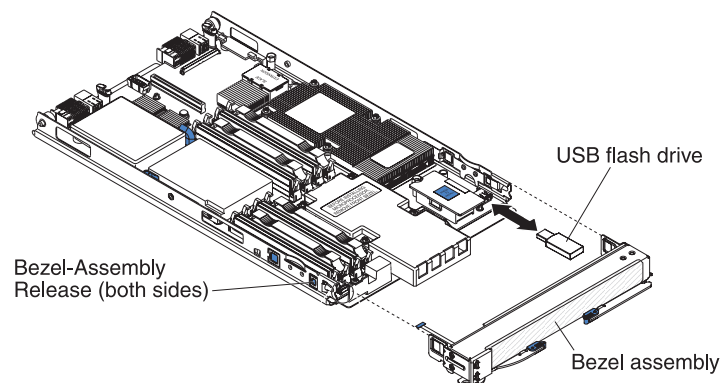


To remove a USB flash drive, complete the following steps:

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. If an MPE unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
5. Remove the blade server bezel assembly (see “Removing the bezel assembly” on page 33).
6. Slide the USB flash drive out of the USB connector on the system board.
7. If you are instructed to return the USB flash drive, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing a USB flash drive

The following illustration shows how to install an embedded USB flash drive on the blade server system board.



To install a USB flash drive, complete the following steps:

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

2. Locate the USB connector on the system board and insert the USB flash drive in the connector.
3. Install the bezel assembly (see “Installing the bezel assembly” on page 34).
4. Install the MPE unit or expansion unit, if you removed one while you removed the USB flash drive (see “Installing an expansion unit” on page 32).
5. Install the blade server cover (see “Installing the blade server cover” on page 30).
6. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

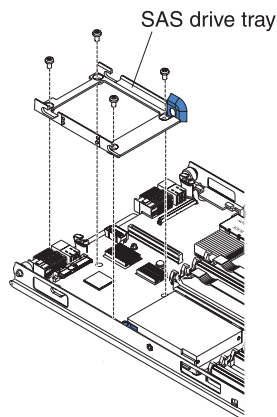
Removing and replacing Tier 2 CRUs

You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for the server.

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

Removing the SAS drive tray

The following illustration shows how to remove the SAS drive tray from the blade server:



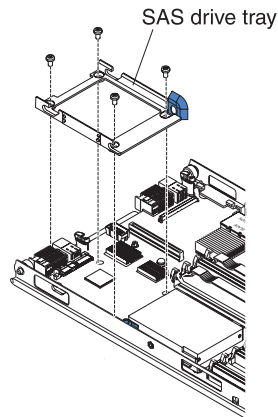
To remove the SAS drive tray, complete the following steps.

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. If you are removing the drive tray from the blade server and an MPE unit or expansion unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
5. Remove the SAS drive or filler from the drive tray, if one is installed (see “Removing a SAS drive” on page 35).
6. Remove the four screws that secure the drive tray to the system board; then, lift the drive tray out of the blade server.

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

Installing the SAS drive tray

The following illustration shows how to install the SAS drive tray in the blade server; installing the SAS drive tray in the MPE unit is similar.

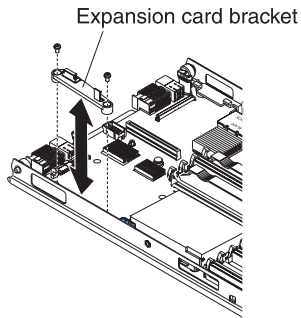


To install the hard disk drive tray, complete the following steps:

1. Remove the drive tray from the packaging.
2. Orient the drive tray over the four mounting holes in the system board and place the drive tray into position.
3. Install the four screws that secure the drive tray to the system board.
4. If you removed the hard disk drive while you removed the drive tray, reinstall it (see "Installing a SAS drive" on page 36).
5. Install the MPE unit or expansion unit, if you removed one while you removed the drive tray (see "Installing an expansion unit" on page 32).
6. Install the blade server cover (see "Installing the blade server cover" on page 30).
7. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 28).

Removing an expansion-card bracket

The following illustration shows how to remove an expansion-card bracket from the system board of the blade server; removing an expansion-card bracket from the MPE unit is similar.



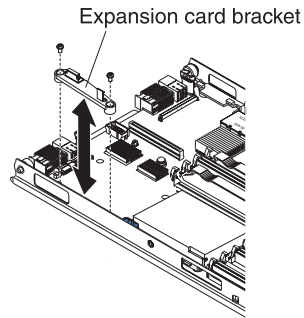
To remove an expansion-card bracket, complete the following steps.

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. If you are removing the bracket from the blade server and an MPE unit or expansion unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
5. If a standard-form-factor expansion card is installed, remove it (see “Removing a standard-form-factor expansion card” on page 40).
6. Locate the expansion-card bracket in front of SAS connector 1 (see “System-board connectors” on page 7).
7. Use a screwdriver to remove the two screws that attach the expansion-card bracket to the system board.
8. If you are instructed to return the expansion-card bracket, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing an expansion-card bracket

An expansion-card bracket is required when you install a standard-form-factor expansion card. Some blade server models might already have an installed expansion card bracket.

The following illustration shows how to install an expansion-card bracket in the blade server; installing an expansion-card bracket in the MPE unit is similar.



To install an expansion-card bracket, complete the following steps:

1. Remove the expansion-card bracket from the packaging.
2. Locate SAS connector 1 (see “System-board connectors” on page 7).
3. Orient the expansion-card bracket so that the screw holes in the bracket are lined up with the two screw holes in front of SAS connector 1 and closest to the side of the blade server. The flat side of the expansion-card bracket should be towards the side of the blade server.
4. Use a screwdriver to install two screws into the expansion-card bracket to attach the bracket to the system board.
5. If a standard-form-factor expansion card expansion card was installed, reinstall it (see “Installing a standard-form-factor expansion card” on page 45).
6. Install the MPE unit or expansion unit, if you removed one while you removed the expansion-card bracket (see “Installing an expansion unit” on page 32).
7. Install the blade server cover (see “Installing the blade server cover” on page 30).
8. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

Removing and replacing FRUs

FRUs must be installed only by trained service technicians.

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

Removing a microprocessor and heat sink

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

Attention: Do *not* use an alcohol wipe with the microprocessor.

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

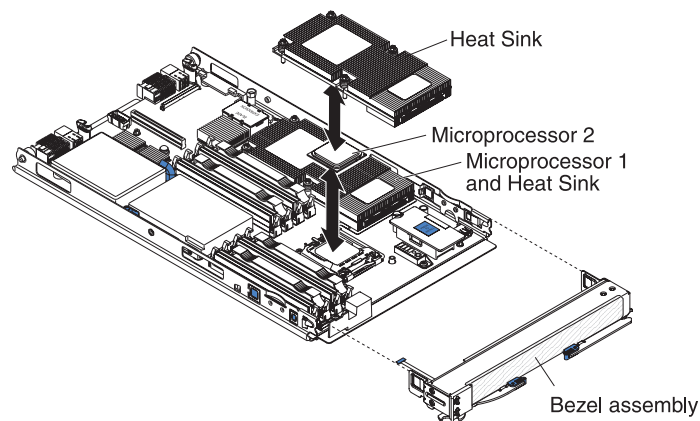
1. Carefully handle the heat sink and microprocessor when you remove and install these components. Do not touch the thermal material or otherwise allow it to become contaminated.

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

Notes:

- The heat-sink FRU is packaged with the thermal material applied to the underside. This thermal material is not available as a separate FRU. The heat sink must be replaced when new thermal material is required, such as when a defective microprocessor is replaced or if the thermal material is contaminated or has come in contact with another object other than its paired microprocessor.
- The microprocessor FRU for this blade server and MPE unit includes a heat sink.
- A heat-sink FRU can be ordered separately if the thermal material becomes contaminated.

The following illustration shows how to remove a microprocessor and heat sink from the blade server; the procedure for removing a microprocessor and heat sink from the MPE unit is similar.



To remove a microprocessor and heat sink, complete the following steps:

1. Read the safety information that begins on page "Safety statements" on page viii and "Installation guidelines" on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see "Removing the blade server from a BladeCenter unit" on page 27).
3. Remove the blade server cover (see "Removing the blade server cover" on page 29).
4. If you are removing a microprocessor from the blade server and an MPE unit or expansion unit is installed, remove the MPE unit (see "Removing an expansion unit" on page 31).
5. Identify the microprocessor that is to be removed.

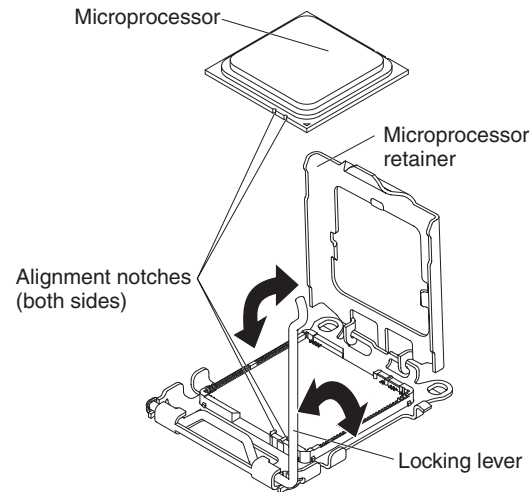
Note: If you are replacing a failed microprocessor, make sure that you have selected the correct microprocessor for replacement (see "System-board connectors" on page 7).

6. If you are removing microprocessor 2 (the microprocessor that is closest to the front of the blade server or MPE unit), remove the bezel assembly (see "Removing the bezel assembly" on page 33).

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



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.

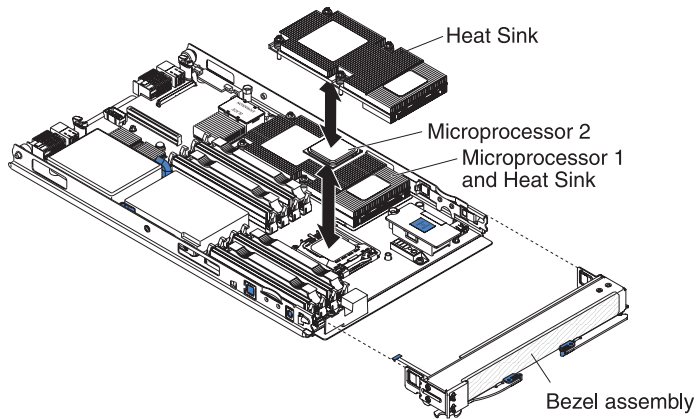
8. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops in the fully open position (approximately a 135° angle).
9. Rotate the microprocessor retainer to the open position.

Attention: Handle the microprocessor only by its edges. Do not touch the contacts on the bottom of the microprocessor or in the microprocessor socket. Touching these contacts might result in permanent damage to the system board.

10. Use your fingers to pull the microprocessor out of the socket.
11. 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

The following illustration shows how to install a microprocessor and heat sink in the blade server; the procedure for installing a microprocessor and heat sink in the MPE unit is similar.



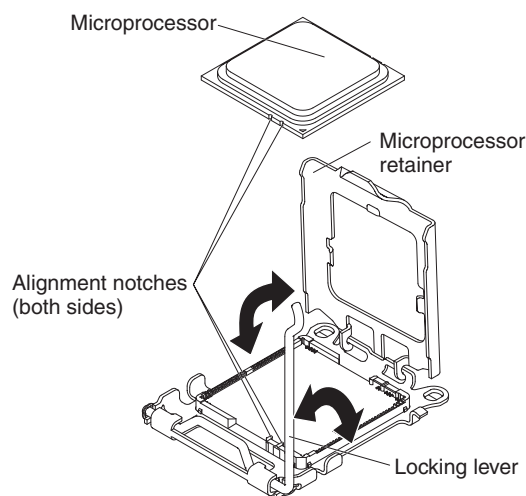
To install a microprocessor and heat sink, complete the following steps.

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.

1. Make sure that the locking lever and the microprocessor retainer on the microprocessor socket are in the fully open position (each at approximately a 135° angle).
2. If a dust cover is installed over the microprocessor socket, use your fingers to remove the dust cover.

Attention: Handle the microprocessor only by its edges. Do not touch the contacts on the bottom of the microprocessor or in the microprocessor socket. Touching these contacts might result in permanent damage to the system board.

3. 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.
4. Remove the cover from the bottom of the microprocessor.

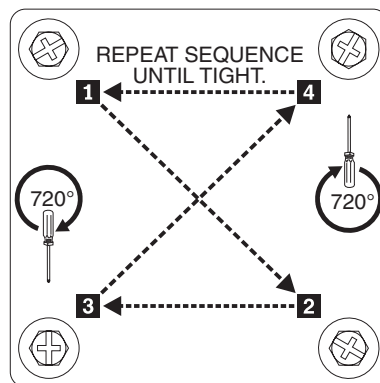


Attention:

- 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.
5. Center the microprocessor over the microprocessor socket. Align the notches on both sides of the microprocessor with the notches in the socket and carefully place the microprocessor into the socket.
 6. Carefully close the microprocessor retainer.
 7. Rotate the locking lever on the microprocessor socket to the closed and locked position. Make sure that the lever is secured in the locked position by the tab on the microprocessor socket.
 8. 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, thermal material side down. Press firmly on the heat sink.
 - c. Press firmly on the captive screws and tighten them with a screwdriver. Follow the pattern that is shown on the following label. Rotate each screw two full rotations each time. Repeat the sequence until the screws are tight. Do not overtighten the screws by using excessive force.



9. If you removed the bezel assembly, install it (see "Installing the bezel assembly" on page 34).
10. Install the MPE unit or expansion unit, if you removed one while you removed the microprocessor and heat sink (see "Installing an expansion unit" on page 32).
11. Install the blade server cover (see "Installing the blade server cover" on page 30).
12. Install the blade server into the BladeCenter unit (see "Installing the blade server in a BladeCenter unit" on page 28).

Removing the system-board assembly

This section describes how to remove components from the blade server when the system-board assembly is being replaced; the procedure for removing components from the MPE unit when the MPE board assembly is being replaced is similar.

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

Note: See “System board layouts” on page 6 for information about the locations of the connectors on the system board.

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

1. Read the safety information that begins on page “Safety statements” on page viii and “Installation guidelines” on page 25.
2. If the blade server is installed in a BladeCenter unit, remove it (see “Removing the blade server from a BladeCenter unit” on page 27).
3. Remove the blade server cover (see “Removing the blade server cover” on page 29).
4. If an MPE unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
5. Remove the blade server bezel assembly (see “Removing the bezel assembly” on page 33).
6. Remove all of the installed components in the following list from the system-board assembly; then, place them on a static-protective surface or install them on the new system-board assembly.
 - I/O-expansion cards. See “Removing an I/O expansion card” on page 39.
 - Concurrent KVM card. See “Removing a concurrent KVM feature card” on page 51.
 - Hard disk drives. See “Removing a SAS drive” on page 35.
 - Microprocessors and heat sinks. See “Removing a microprocessor and heat sink” on page 57.
 - DIMMs. See “Removing a memory module” on page 37.
 - (LS22 Type 7901 and single-width LS42 Type 7902 only) LS22 optimizer. See “Removing the LS22 optimizer” on page 49.
7. If you are instructed to return the system-board assembly, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

Installing the system-board assembly

This section describes how to install components in the blade server when the system-board assembly is being replaced; the procedure for installing components in the MPE unit when the MPE board assembly is being replaced is similar.

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.

Note: You might have to remove component fillers or covers before you can install some components (see the *Installation and User's Guide* for more information).

- Microprocessors and heat sinks. See “Installing a microprocessor and heat sink” on page 59.
 - DIMMs. See “Installing a memory module” on page 38.
 - Hard disk drives. See “Installing a SAS drive” on page 36.
 - Concurrent KVM card. See “Installing a concurrent KVM feature card” on page 51.
 - I/O-expansion cards. See “Installing an I/O expansion card” on page 43.
 - (LS22 Type 7901 and single-width LS42 Type 7902 only) LS22 optimizer. See “Installing the LS22 optimizer” on page 50.
2. Install the bezel assembly (see “Installing the bezel assembly” on page 34).
 3. Install the MPE unit or expansion unit, if you removed one while you removed the system board (see “Installing an expansion unit” on page 32).
 4. Install the blade server cover (see “Installing the blade server cover” on page 30).
 5. Install the blade server into the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).

Chapter 5. Diagnostics

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

Note: The blade server uses shared resources that are installed in the BladeCenter unit. Problems with these shared resources might appear to be in the blade server (see “Solving shared BladeCenter resource problems” on page 160 for information about isolating problems with these resources). See the *Problem Determination and Service Guide* or the *Hardware Maintenance Manual and Troubleshooting Guide* for your BladeCenter unit and other BladeCenter component documentation for diagnostic procedures for shared BladeCenter components.

If you cannot diagnose and correct a problem by using the information in this chapter, see “Getting help and technical assistance,” on page 167 for more information.

Diagnostic tools

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

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

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

- **Troubleshooting tables**

These tables list problem symptoms and actions to correct the problems. See “Troubleshooting tables” on page 89 for more information.

- **Light path diagnostics**

Use the light path diagnostics to diagnose system errors quickly. See “Light path diagnostics” on page 103 for more information.

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

The diagnostic programs are the primary method of testing the major components of the blade server. These programs are stored in read-only memory (ROM) on the blade server. See “Dynamic System Analysis diagnostic programs and messages” on page 108 for more information.

POST

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

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

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

If POST detects a problem, more than one beep might sound, or an error message is displayed. See “Beep code descriptions” and “Dynamic System Analysis diagnostic programs and messages” on page 108 for more information.

POST beep codes

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

Beep code descriptions

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

A single problem might cause more than one error message or beep code. When this occurs, correct the cause of the first error message or beep code. The other error messages and beep codes 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 93 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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 48 and “Installing the battery” on page 48). 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 48 and “Installing the battery” on page 48) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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
1-1-4	BIOS ROM checksum failed.	<ol style="list-style-type: none"> 1. Update the BIOS code (see “Firmware updates” on page 17). 2. Reseat the DIMMs (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38). 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 37 and “Installing a memory module” on page 38) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 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 62 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 62 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 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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 following components: <ol style="list-style-type: none"> a. DIMMs (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38) b. MPE unit (if one is installed) (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32) 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 37 and “Installing a memory module” on page 38) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62) c. (Trained service technician only) MPE board assembly (if one is installed) (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)
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 37 and “Installing a memory module” on page 38) 2. Replace the lowest-numbered pair of DIMMs with an identical known good pair of DIMMs; then, restart the server. If the beep code error remains, go to 3b. Return one DIMM at a time from the failed pair to its connector, restarting the server after each DIMM, to identify the failed DIMM (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38). 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 37 and “Installing a memory module” on page 38) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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
2-1-1	Secondary DMA register test failed.	(Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 62 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 62 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 62 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 160). 2. Start another blade server with the keyboard installed on the BladeCenter unit and press the KVM button for the blade server (see “Blade server controls and LEDs” on page 3). If the error remains, replace the keyboard. 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
2-3-1	Screen initialization failed.	(Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
3-1-1	Timer tick interrupt failed.	(Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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
3-1-2	Interval timer channel 2 failed.	(Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 48 and “Installing the battery” on page 48). 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 48 and “Installing the battery” on page 48) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)
3-3-2	I2C error occurred.	<ol style="list-style-type: none"> 1. Power down the blade server and reseat it in the BladeCenter unit. 2. Reseat the following components: <ol style="list-style-type: none"> a. DIMMs (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38) b. MPE unit, if one is installed (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32) 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 37 and “Installing a memory module” on page 38) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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 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 bank of connectors enabled).</p> <ol style="list-style-type: none"> 1. Install or reseal DIMMs and restart the blade server <i>three times</i> (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38). 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 37 and “Installing a memory module” on page 38) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)

No-beep symptoms

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 3, “Parts listing, Types 7901 and 7902,” on page 19 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 (see “Removing the system-board assembly” on page 62 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 164.
No beep and no video (system attention LED is lit)	See “Light path diagnostics” on page 103.

Error logs

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

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

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

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

                  Sensor Number= 40
                  Event Direction/Type= 01

                  Event Data= 52 00 1A
```

Important:

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

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

For more information about viewing the management-module event log, see the *Management Module User's Guide* or the *Management Module Command-Line Interface Reference Guide*. The most recent versions of all BladeCenter documentation are at <http://www.ibm.com/bladecenter/>.

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 Setup Utility program (the menu choices are described in the *Installation and User's Guide*) or through the management-module user interface. When you are troubleshooting an error, be sure to clear the BMC log so that you can find current errors more easily.

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

Each BMC log entry 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 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 Setup Utility program (see the *Installation and User's Guide* for more information).

Viewing the BMC log from the Setup Utility program

For more information about using the 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 (see "Turning on the blade server" on page 5).
2. When the prompt Press F1 for Setup is displayed, press F1. If you have set a power-on password, you must type the password and press Enter to start the Setup Utility program.
3. Select **Advanced Settings**, select **Baseboard Management Controller (BMC) settings**, and then select **BMC System Event Log**.

BMC error messages

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

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Types 7901 and 7902,” on page 19 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 39 and “Installing an I/O expansion card” on page 43). 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 39 and “Installing an I/O expansion card” on page 43) b. (Trained service technician only) System-board assembly (see “Removing the system-board assembly” on page 62 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 feature card” on page 51 and “Installing a concurrent KVM feature card” on page 51). 2. Replace the cKVM card (see “Removing a concurrent KVM feature card” on page 51 and “Installing a concurrent KVM feature card” on page 51).
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 an I/O expansion card” on page 39 and “Installing an I/O expansion card” on page 43) b. RAID battery (see the documentation for your SAS connectivity card) c. Expansion unit (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32) 2. Replace the expansion unit (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32).
BEM 2 fault	<ol style="list-style-type: none"> 1. Reseat the expansion unit (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32). 2. Replace the expansion unit (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32).
High-speed expansion card fault	<ol style="list-style-type: none"> 1. Reseat the high-speed expansion card (see “Removing a high-speed expansion card” on page 41 and “Installing a high-speed expansion card” on page 46). 2. Replace the high-speed expansion card (see “Removing a high-speed expansion card” on page 41 and “Installing a high-speed expansion card” on page 46).

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Types 7901 and 7902,” on page 19 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 33 and “Installing the bezel assembly” 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. Bezel assembly (see “Removing the bezel assembly” on page 33 and “Installing the bezel assembly” on page 34) b. (Trained service technician only) System-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)
Memory module bus fault	<ol style="list-style-type: none"> 1. Reseat the expansion unit (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32) 2. Replace the expansion unit system board (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32)
Firmware (BIOS) halted, System management bus error	Update the blade server firmware (see “Firmware updates” on page 17).
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 a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Reseat all the optional devices in the blade server, one at a time, restarting the blade server each time, to determine where the problem is (see Chapter 4, “Removing and replacing blade server components,” on page 25). 3. Remove optional devices from the blade server one at a time to determine where the problem is (see Chapter 4, “Removing and replacing blade server components,” on page 25). 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 (see Chapter 4, “Removing and replacing blade server components,” on page 25) b. (Trained service technician only) System-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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 a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. (Trained service technician only) Reseat the microprocessor (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). 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 57 and “Installing a microprocessor and heat sink” on page 59) b. (Trained service technician only) System-board assembly (see “Removing the system-board assembly” on page 62 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 (see “System reliability guidelines” on page 26). 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 57 and “Installing a microprocessor and heat sink” on page 59).
Firmware (BIOS) backup ROM corruption, System board failure	<ol style="list-style-type: none"> 1. Update the blade server firmware (see “Firmware updates” on page 17). 2. Replace the optional expansion unit (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32).
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 expansion unit” on page 31 and “Installing an expansion unit” on page 32). 2. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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. 2. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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
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 a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
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 (see the <i>IBM BladeCenter Management Module User’s Guide</i> for more information).
Firmware (BIOS) ROM corruption detected	Update the BIOS code (see “Firmware updates” on page 17).
Internal error CPU fault	Make sure that all of the software and the drivers are at the latest levels (see “Firmware updates” on page 17).
CPU over temperature	Make sure that the blade server is sufficiently cooled (see “System reliability guidelines” on page 26).
CPU fault	(Trained service technician only) Replace the microprocessor (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59).
CPU disabled	(Trained service technician only) Replace the microprocessor (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59).
Invalid CPU configuration	Make sure that microprocessor is supported and compatible (see “Features and specifications” on page 2).
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 a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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
Hard drive <i>xx</i> removal detected	Replace SAS drive <i>xx</i> (see “Removing a SAS drive” on page 35 and “Installing a SAS drive” on page 36).
Hard drive <i>xx</i> fault	Information only. No action is required.

POST error codes

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

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
062	Three consecutive startup failures	<ol style="list-style-type: none"> 1. Run the Setup Utility program, select Load Default Settings, make sure that the date and time are correct, and save the settings (see “Using the Setup Utility program” on page 11). 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 48 and “Installing the battery” on page 48) b. (Trained service technician only) Microprocessor 1 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) c. (Trained service technician only) Microprocessor 2 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) 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 48 and “Installing the battery” on page 48) b. (Trained service technician only) Microprocessor 1 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) c. (Trained service technician only) Microprocessor 2 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) d. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 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 62 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 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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	(Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
129	Internal L1 cache error	<ol style="list-style-type: none"> 1. Reseat the following components: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor 1 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) b. (Trained service technician only) Microprocessor 2 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) 2. Replace the following components one at a time, in the order shown, restarting the server each time: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor 1 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) b. (Trained service technician only) Microprocessor 2 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59)
151	Real time clock failure	<ol style="list-style-type: none"> 1. Reseat the battery (see “Removing the battery” on page 48 and “Installing the battery” on page 48). 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 48 and “Installing the battery” on page 48) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
161	Real-time clock battery failure	<ol style="list-style-type: none"> 1. Run the Setup Utility program (see “Using the Setup Utility program” on page 11). 2. Reseat the battery (see “Removing the battery” on page 48 and “Installing the battery” on page 48). 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 48 and “Installing the battery” on page 48) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)
162	Invalid configuration information or CMOS RAM checksum failure.	<ol style="list-style-type: none"> 1. Run the Setup Utility program, select Load Default Settings, and save the settings (see “Using the Setup Utility program” on page 11). 2. Reseat the battery (see “Removing the battery” on page 48 and “Installing the battery” on page 48). 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 48 and “Installing the battery” on page 48) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)
163	Time of day not set.	<ol style="list-style-type: none"> 1. Run the Setup Utility program, select Load Default Settings, make sure that the date and time are correct, and save the settings (see “Using the Setup Utility program” on page 11). 2. Reseat the battery (see “Removing the battery” on page 48 and “Installing the battery” on page 48). 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 48 and “Installing the battery” on page 48) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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
164	Memory size does not match CMOS.	<ol style="list-style-type: none"> 1. Run the Setup Utility program, make sure that the memory configuration is correct, and save the settings (see “Using the Setup Utility program” on page 11). 2. Reseat the DIMMs (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38). 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 37 and “Installing a memory module” on page 38) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)
175	Bad EEPROM CRC #1	(Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
177	Bad checksum	(Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
178	EEPROM not functional	(Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
184	Bad power-on password.	<ol style="list-style-type: none"> 1. Run the Setup Utility program, select Load Default Settings, and save the settings (see “Using the Setup Utility program” on page 11). 2. Reseat the battery (see “Removing the battery” on page 48 and “Installing the battery” on page 48). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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
185	Corrupted boot sequence	<ol style="list-style-type: none"> 1. Run the Setup Utility program, select Load Default Settings, and save the settings (see “Using the Setup Utility program” on page 11). 2. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
186	Security hardware control logic error	(Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
187	VPD Serial Number not set	(Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 62 and “Installing the system-board assembly” on page 62).
189	Three attempts to enter the incorrect password.	Restart the blade server, run the Setup Utility program, and change the power-on password (see “Using the Setup Utility program” on page 11).
201	Base memory error or extended memory error.	<ol style="list-style-type: none"> 1. Update the blade server firmware and restart the blade server (see “Firmware updates” on page 17). 2. Reseat the DIMMs (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38). 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 37 and “Installing a memory module” on page 38) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
229	Internal cache (L2) error.	<ol style="list-style-type: none"> 1. Reseat the following components: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor 1 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) b. (Trained service technician only) Microprocessor 2 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) 2. Replace the components listed in step 1 one at a time, in the order shown, restarting the server each time.
301	Keyboard failure.	<ol style="list-style-type: none"> 1. If you have installed a USB keyboard, run the Setup Utility program and enable keyboardless operation to prevent the POST error message 301 from being displayed during startup (see “Using the Setup Utility program” on page 11). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
303	Keyboard controller error.	(Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 160). 2. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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 160). 2. Reseat the diskette drive (see the instructions for your diskette drive). 3. Replace the diskette drive (see the instructions for your diskette drive). 4. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
662	Diskette drive configuration error.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 2. Reseat the diskette drive (see the instructions for your diskette drive). 3. Replace the diskette drive (see the instructions for your diskette drive). 4. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Error code	Description	Action
1200	Processor machine check.	<ol style="list-style-type: none"> 1. Reseat the following components: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor 1 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) b. (Trained service technician only) Microprocessor 2 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) 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 1 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) b. (Trained service technician only) Microprocessor 2 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59) c. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)
18XX	PCI error.	<ol style="list-style-type: none"> 1. Run the Setup Utility program and make sure that the interrupt resource settings are correct (see “Using the Setup Utility program” on page 11). 2. Remove each I/O-expansion card one at a time, restarting the blade server each time, until the problem is isolated (see “Removing an I/O expansion card” on page 39 and “Installing an I/O expansion card” on page 43). 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. Failed I/O-expansion card (see “Removing an I/O expansion card” on page 39 and “Installing an I/O expansion card” on page 43) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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 “Using the ServerGuide Setup and Installation CD” on page 14). 2. Run the hard disk drive diagnostic tests (for information about using the diagnostic programs, see “Dynamic System Analysis diagnostic programs and messages” on page 108). 3. Reseat the hard disk drive (see “Removing a SAS drive” on page 35 and “Installing a SAS drive” on page 36). 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. Hard disk drive (see “Removing a SAS drive” on page 35 and “Installing a SAS drive” on page 36) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)
2462	Video configuration error	<ol style="list-style-type: none"> 1. Run the Setup Utility program, select Load Default Settings, and save the settings (see “Using the Setup Utility program” on page 11).
5962	CD or DVD drive configuration error.	<ol style="list-style-type: none"> 1. Run the Setup Utility program, select Load Default Settings, and save the settings (see “Using the Setup Utility program” on page 11). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. Make sure the drive works with another blade server. If it continues to fail, see the documentation that comes with the drive for troubleshooting information. 4. Reseat the battery (see “Removing the battery” on page 48 and “Installing the battery” on page 48). 5. 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 48 and “Installing the battery” on page 48) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 		
Error code	Description	Action
8603	Pointing device error.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 2. Reseat the pointing device (mouse) 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ol style="list-style-type: none"> a. Pointing device (mouse) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)
I999301	Fixed disk boot sector error.	<ol style="list-style-type: none"> 1. Reseat the hard disk drive (see “Removing a SAS drive” on page 35 and “Installing a SAS drive” on page 36). 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. Hard disk drive (see “Removing a SAS drive” on page 35 and “Installing a SAS drive” on page 36) b. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)

Checkout procedure

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

About the checkout procedure

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

- Read the safety information that begins on page “Safety statements” on page viii.
- 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 93 for information about diagnosing microprocessor problems.

- If the blade server is halted, review and follow the instructions that are displayed. If the blade server is halted and no error message is displayed, see “Troubleshooting tables” and “Solving undetermined problems” on page 164.
- For intermittent problems, check the error log; see “Error logs” on page 72.
- 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 164.
- If device errors occur, see “Troubleshooting tables.”

Performing the checkout procedure

To perform the checkout procedure, complete the following steps:

1. If the blade server is running, turn off the blade server (see “Turning off the blade server” on page 6).
2. Turn on the blade server (see “Turning on the blade server” on page 5). Make sure that the blade server has control of the video (the KVM button is lit). If the blade server does not start, see “Troubleshooting tables.”
3. Record any POST beep codes that sound or POST error messages that are displayed on the monitor. If an error is displayed, follow the recommended steps that are also displayed (see “POST” on page 65).
4. Check the control panel blade-error LED; if it is lit, check the light path diagnostics LEDs (see “Light path diagnostics” on page 103).
5. Check for the following results:
 - Successful completion of POST, indicated by a single beep
 - Successful completion of startup, indicated by a readable display of the operating-system desktop
6. Did a single beep sound and are there readable instructions on the main menu?
 - **No:** Find the failure symptom in “Troubleshooting tables”; if necessary, see “Solving undetermined problems” on page 164.
 - **Yes:** Run the diagnostic programs (see Chapter 5, “Diagnostics,” on page 65).
 - If you receive an error, see Chapter 5, “Diagnostics,” on page 65.
 - If the diagnostic programs were completed successfully and you still suspect a problem, see “Solving undetermined problems” on page 164.

Troubleshooting tables

Use the troubleshooting tables to find solutions to problems that have identifiable symptoms. If these symptoms relate to shared BladeCenter unit resources, see “Solving shared BladeCenter resource problems” on page 160.

If you cannot find a problem in these tables, see Chapter 5, “Diagnostics,” on page 65 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.
3. Reinstall the new software or new device.

General 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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
A cover lock is broken, an LED is not working, or a similar problem has occurred.	If the part is a CRU, replace it. If the part is a FRU, the part must be replaced by a trained service technician.

Hard disk drive problems

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are CRUs and which components are FRUs. • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 	
Symptom	Action
Not all drives are recognized by the hard disk drive diagnostic test.	<ol style="list-style-type: none"> 1. Remove the drive that is indicated by the diagnostic tests (see “Removing a SAS drive” on page 35). 2. Run the hard disk drive diagnostic tests (for information about using the diagnostic programs, see “Dynamic System Analysis diagnostic programs and messages” on page 108). 3. If the remaining drives are recognized, replace the drive that you removed with a new one (see “Installing a SAS drive” on page 36).
The blade server stops responding during the hard disk drive diagnostic test.	<ol style="list-style-type: none"> 1. Remove the hard disk drive that was being tested when the blade server stopped responding (see “Removing a SAS drive” on page 35). 2. Run the hard disk drive diagnostic tests (for information about using the diagnostic programs, see “Dynamic System Analysis diagnostic programs and messages” on page 108). 3. If the hard disk drive diagnostic test runs successfully, replace the drive that you removed with a new one (see “Installing a SAS drive” on page 36).
A hard disk drive passes the hard disk drive diagnostics test, but the problem remains.	<ol style="list-style-type: none"> 1. Run the hard disk drive diagnostic test again (see “Dynamic System Analysis diagnostic programs and messages” on page 108). 2. If the hard disk drive continues to pass the diagnostic test but the drive continues to have a problem, replace the drive with a new one (see “Removing a SAS drive” on page 35 and “Installing a SAS drive” on page 36).

Intermittent 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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"> 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 hard disk drives are configured correctly (see “Using the LSI Logic Configuration Utility program” on page 18). Check the BMC log (see “Error logs” on page 72).

Keyboard or mouse problems

The keyboard and mouse are shared BladeCenter unit resources. First, make sure that the keyboard and mouse are assigned to the blade server; then, see the following table and “Solving shared BladeCenter resource problems” on page 160.

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 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"> Make sure that the KVM 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 (see “Blade server controls and LEDs” on page 3). Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). Make sure that: <ul style="list-style-type: none"> The keyboard and mouse work with another blade server. The device drivers are installed correctly. The keyboard and mouse are recognized as USB, not PS/2, devices by the blade server. Although the keyboard and mouse might be a PS/2-style devices, communication with them is through USB in the BladeCenter unit. Some operating systems enable you to select the type of keyboard and mouse during installation of the operating system. If this is the case, select USB. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).

Memory problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Types 7901 and 7902,” on page 19 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 (see “Features and specifications” on page 2). • If you changed the memory, you updated the memory configuration in the Setup Utility program (see “Using the Setup Utility program” on page 11). • All banks of memory are enabled. The blade server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled (see “Using the Setup Utility program” on page 11). 2. Check BMC log for error message 289 (see “Error logs” on page 72): <ul style="list-style-type: none"> • If a DIMM was disabled by a system-management interrupt (SMI), replace the DIMM (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38). • If a DIMM was disabled by the user or by POST, run the Setup Utility program and enable the DIMM (see “Using the Setup Utility program” on page 11). 3. Reseat the following components: <ol style="list-style-type: none"> a. DIMMs (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38) b. MPE unit, if one is installed (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32) 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. DIMMs (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38) b. (Trained service technician only) MPE board assembly, if one is installed (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32) c. (Trained service technician only) system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)

Microprocessor problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Types 7901 and 7902,” on page 19 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.	<p>For blades with one microprocessor installed:</p> <ol style="list-style-type: none"> 1. Use the light path diagnostics to find a failing microprocessor (see “Light path diagnostics” on page 103). If light path diagnostics indicates a failing microprocessor, perform the following steps and restart the blade server after each step until the error is corrected: <ol style="list-style-type: none"> a. (Trained service technician only) Reseat the microprocessor (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). b. (Trained service technician only) Replace the microprocessor (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). 2. If the error condition remains, reseat the following parts one at a time and restart the blade server after each step until the error is corrected: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor 1 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). b. (Trained service technician only) Microprocessor 2 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). c. (Trained service technician only) Microprocessor 3 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). d. (Trained service technician only) Microprocessor 4 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). 3. If the error condition remains, replace the following parts one at a time and restart the blade server after each step until the error is corrected: <ol style="list-style-type: none"> a. (Trained service technician only) Microprocessor 1 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). b. (Trained service technician only) Microprocessor 2 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). c. (Trained service technician only) Microprocessor 3 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). d. (Trained service technician only) Microprocessor 4 (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59).

Monitor or video problems

The video monitor is a shared BladeCenter unit resource. First, make sure that the video monitor is assigned to the blade server; then, see the following table and “Solving shared BladeCenter resource problems” on page 160.

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 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 160). 2. Check the management-module event log for related errors (see the <i>Management Module User’s Guide</i> or the <i>Management Module Command-Line Interface Reference Guide</i>). 3. Make sure that: <ul style="list-style-type: none"> • The video from another blade server works. • Damaged BIOS software is not affecting the video; see “Recovering from a BIOS update failure” on page 158. • The device drivers are installed correctly. 4. Reseat the following components: <ol style="list-style-type: none"> a. Reseat the memory (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38) b. (Trained service technician only) Reseat the microprocessors (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). 5. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
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 160). 2. Make sure that the video from another blade server works. 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
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 160). 3. Make sure that the video from another blade server works. 4. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).

Network connection problems

The blade server connects to the network using shared BladeCenter unit resources. See the following table and “Solving shared BladeCenter resource problems” on page 160.

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 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 160). 2. Make sure that: <ul style="list-style-type: none"> • The correct device drivers are installed. • The Ethernet controllers correctly configured. • Optional I/O-expansion cards are correctly installed and configured. 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).

Optional-device 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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. • You have not loosened any other installed devices or cables. • You updated the configuration information in the Setup Utility program. Whenever memory or any other device is changed, you must update the configuration (see “Using the Setup Utility program” on page 11). 2. If the device comes with its own test instructions, use those instructions to test the device. 3. Reseat the device that you just installed. 4. Replace the device that you just installed.

Power error messages

Power to the blade server is provided by shared BladeCenter unit resources. See the following table and “Solving shared BladeCenter resource problems” on page 160.

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Types 7901 and 7902,” on page 19 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 a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. Reseat the MPE unit, if one is installed (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32). 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. (Trained service technician only) MPE board assembly, if one is installed (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32) b. (Trained service technician only) System-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62)
VRM Power Good fault	<ol style="list-style-type: none"> 1. Reseat the blade server (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
System over recommended voltage for +12v.	<ol style="list-style-type: none"> 1. Reseat the blade server (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
System over recommended voltage for +3.3v.	<ol style="list-style-type: none"> 1. Reseat the blade server (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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 5V fault.	<ol style="list-style-type: none"> 1. Reseat the blade server (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
VRM voltage over recommended tolerance.	<ol style="list-style-type: none"> 1. Reseat the blade server (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
System under recommended voltage for +12v.	<ol style="list-style-type: none"> 1. Reseat the blade server (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
System under recommended voltage for +3.3v.	<ol style="list-style-type: none"> 1. Reseat the blade server (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
System under recommended 5V fault.	<ol style="list-style-type: none"> 1. Reseat the blade server (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).

Power problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See Chapter 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Symptom	Action
Power switch does not work, and the reset button does work.	<ol style="list-style-type: none"> 1. Reseat the control-panel connector (see “Removing the bezel assembly” on page 33 and “Installing the bezel assembly” 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. Bezel assembly (see “Removing the bezel assembly” on page 33 and “Installing the bezel assembly” on page 34) b. (Trained service technician only) System-board assembly (see “Removing the system-board assembly” on page 62 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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are CRUs and which components are FRUs.
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Symptom	Action
The blade server does not turn on.	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 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 3). <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; reseal the blade server (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28) and go to step 6 • If the power LED is off, the blade bay is not receiving power, the blade server is defective, or the control panel is loose or defective. 3. Check the power-management policies in the operating system for the blade server. 4. Reseat the blade server (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 5. If you just installed a device in the blade server, remove it and restart the blade server. If the blade server now starts, you might have installed more devices than the power to that blade bay supports. 6. If you tried another blade server in the blade bay when you checked 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. Reseat the following components: <ol style="list-style-type: none"> 1) MPE unit, if one is installed (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32) 2) Control panel cable (see “Removing the bezel assembly” on page 33 and “Installing the bezel assembly” 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) Blade server bezel assembly (see “Removing the bezel assembly” on page 33 and “Installing the bezel assembly” on page 34) 2) (Trained service technician only) MPE board assembly, if one is installed (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62) 3) (Trained service technician only) System-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62) 7. See “Solving undetermined problems” on page 164.

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 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>The blade server does not start and the following conditions are present:</p> <ul style="list-style-type: none"> • The amber system-error LED on the BladeCenter unit system LED panel is lit. • The amber blade error LED on the blade server control panel is lit. • The management-module event log contains the message Processor speed mismatch. 	<p>Make sure that microprocessors 1 and 2 are identical (number of cores, cache size and type, clock speed, internal and external clock frequencies).</p> <p>(Trained service technician only) If microprocessors are not identical, remove the microprocessor with the incorrect specifications and replace it with a microprocessor that has the correct specifications (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59).</p>
<p>The blade server turns off for no apparent reason.</p>	<ol style="list-style-type: none"> 1. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 2. (Trained service technician only) If the microprocessor error LED is lit, replace the microprocessor (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
<p>The blade server does not turn off.</p>	<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 3). 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 a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 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 62 and “Installing the system-board assembly” on page 62).

Removable-media drive problems

The removable-media (CD, DVD, or diskette) drives are shared BladeCenter unit resources. First, make sure that the drives are assigned to the blade server; then, see the following table and “Solving shared BladeCenter resource problems” on page 160.

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 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. 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 removable-media drives (see “Blade server controls and LEDs” on page 3). 2. Check the function of the shared BladeCenter unit resources (see “Solving shared BladeCenter resource problems” on page 160). 3. Run the Setup Utility program and make sure that the drive is enabled (see “Using the Setup Utility program” on page 11). 4. For CD or DVD problems, make sure that the correct device driver is installed. 5. Reseat the battery or power cable, if one is used to power the drive. 6. 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 48 and “Installing the battery” on page 48). b. (Trained service technician only) System-board assembly (see “Removing the system-board assembly” on page 62 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 onto a blade server that is not the current owner of the media tray [CD or DVD drive, diskette drive, and USB port], SUSE Linux detects the CD or DVD drive as /dev/sr0 instead of /dev/cdrom.)	<p>Establish a link between /dev/sr0 and /dev/cdrom as follows:</p> <ol style="list-style-type: none"> 1. Enter the following command: <pre>rm /dev/cdrom; ln -s /dev/sr0 /dev/cdrom</pre> 2. Insert the following line in the /etc/fstab file: <pre>/dev/cdrom /media/cdrom auto ro,noauto,user,exec 0 0</pre>
The CD or DVD drive is not recognized after it is 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 at the bottom right of the desktop. 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

<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 3, "Parts listing, Types 7901 and 7902," on page 19 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 <i>ServerGuide™ Setup and Installation</i> CD will not start.	<ol style="list-style-type: none"> Make sure that the CD or DVD drive is associated with the blade server that you are configuring by pressing the media-tray select button (see "Blade server controls and LEDs" on page 3). Make sure that the blade server supports the ServerGuide program (see "Using the ServerGuide Setup and Installation CD" on page 14). If the startup (boot) sequence settings have been changed, make sure that the CD or DVD drive is first in the startup sequence in the Setup Utility program (see "Using the Setup Utility program" on page 11).
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 blade server supports the operating system (see http://www.ibm.com/servers/eserver/serverproven/compat/us/nos/ematrix.shtml). If it does, either no logical drive is defined (SAS RAID servers), or the ServerGuide System Partition is not present. Run the ServerGuide program and make sure that setup is complete.

Service processor problems

<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 3, "Parts listing, Types 7901 and 7902," on page 19 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 164, and the <i>Hardware Maintenance Manual and Troubleshooting Guide</i> or <i>Problem Determination and Service Guide</i> for your BladeCenter unit.

Software 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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

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 160.

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 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 160).2. Make sure that:<ul style="list-style-type: none">• The operating system supports USB devices.• The correct USB device driver is installed.3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).

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 you identify the source of the error.

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

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

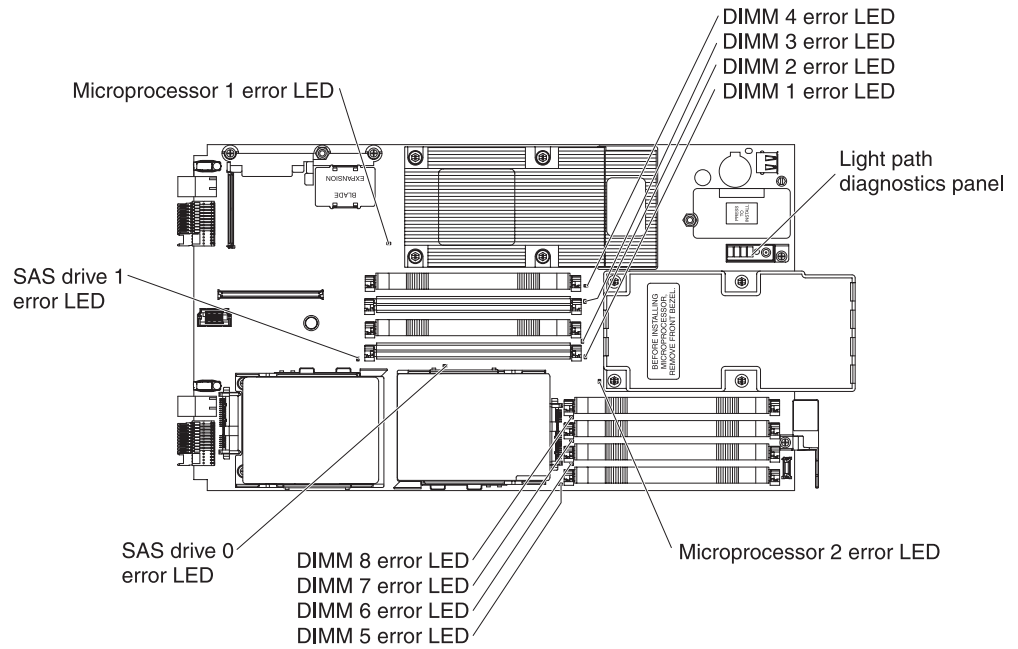
Viewing the light path diagnostics LEDs

Before you work inside the blade server to view light path diagnostics LEDs, read the safety information that begins on page “Safety statements” on page viii and “Handling static-sensitive devices” on page 26.

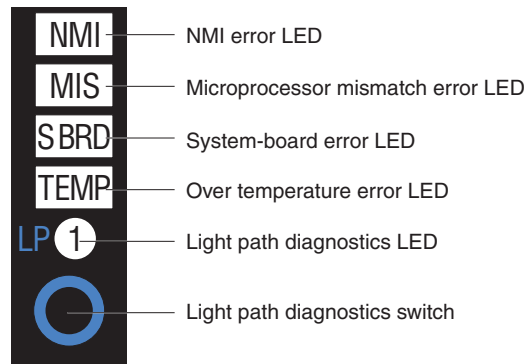
If an error occurs, view the light path diagnostics LEDs in the following order:

1. Look at the control panel on the front of the blade server (see “Blade server controls and LEDs” on page 3).
 - If the information LED is lit, it indicates that information about a suboptimal condition in the blade server is available in the BMC log or in the management-module event log.
 - If the blade-error LED is lit, it indicates that an error has occurred; go to step 2.
2. To view the light path diagnostics panel and LEDs, complete the following steps:
 - a. Remove the blade server from the BladeCenter unit (see “Removing the blade server from a BladeCenter unit” on page 27).
 - 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 29).
 - 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.

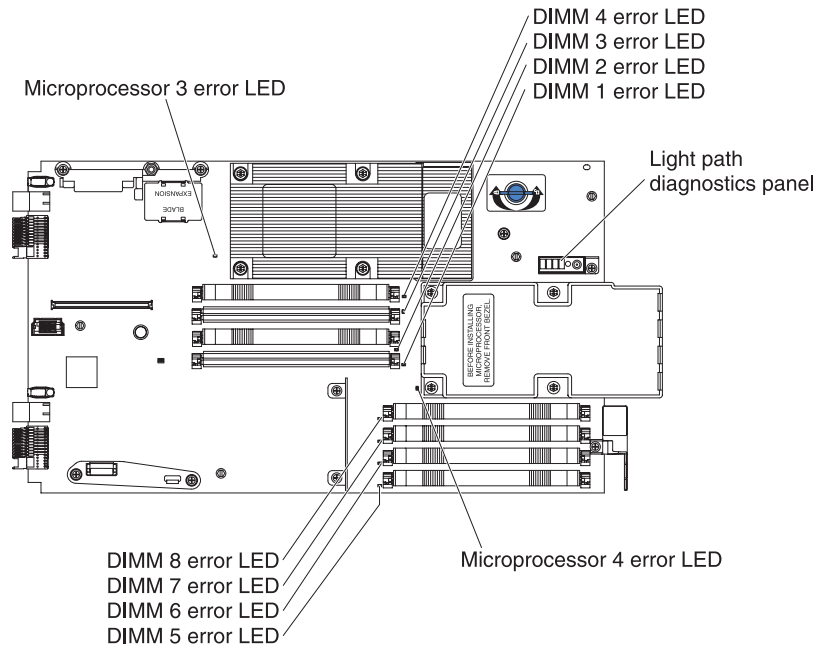
The following illustration shows the locations of the blade server system-board error LEDs and light path diagnostics panel.



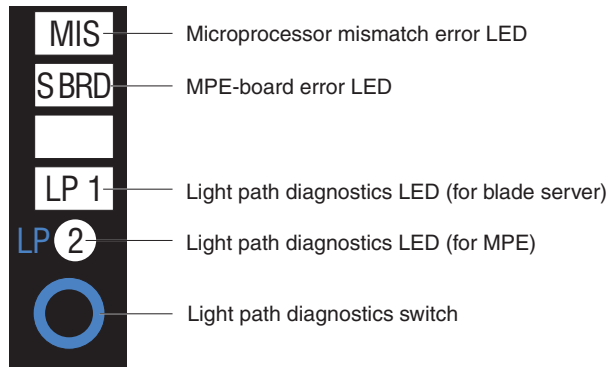
The following illustration shows the LEDs on the blade server system-board light path diagnostics panel.



The following illustration shows the locations of the error LEDs and light path diagnostics panel on the MPE unit.



The following illustration shows the LEDs on the MPE unit light path diagnostics panel.



When you press the light path diagnostics switch, note which LEDs are lit on the blade server system board, MPE unit, and light path diagnostics panels. Using this information and the information in “Light path diagnostics LEDs” can often provide enough information to diagnose the error.

Light path diagnostics LEDs

The following table describes the LEDs on the light path diagnostics panels, on the blade server system board, and on the MPE unit. It also lists 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 3, “Parts listing, Types 7901 and 7902,” on page 19 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. 2. Check the BMC log for information about an error that is not represented by a light path diagnostics LED (see “Error logs” on page 72).
DIMM <i>x</i> error	<ul style="list-style-type: none"> • On the blade server system board: A blade-server DIMM error has occurred. • On the MPE unit: An MPE unit DIMM error has occurred. 	<ol style="list-style-type: none"> 1. Make sure that DIMM <i>x</i> is supported (see “Features and specifications” on page 2). 2. Reseat DIMM <i>x</i> (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38). 3. Replace DIMM <i>x</i> (see “Removing a memory module” on page 37 and “Installing a memory module” on page 38). <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"> • On the blade server light path diagnostics panel: The light path diagnostics LEDs on the blade server system board have power. • On the MPE unit light path diagnostics panel: An error occurred on the blade server system board. 	Remove the MPE unit, if one is installed, and check for lit error LEDs on the blade server system board (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32).
LP2 (on MPE unit only)	Light path diagnostics LEDs on the MPE unit have power.	Check for lit error LEDs on the MPE unit (see “System board LEDs” on page 9).
Microprocessor <i>x</i> error	<ul style="list-style-type: none"> • On the blade server system board: Blade server microprocessor <i>x</i> has failed. • On the MPE unit: MPE unit microprocessor <i>x</i> has failed. 	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat microprocessor <i>x</i> (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). 2. (Trained service technician only) Replace microprocessor <i>x</i> (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59).
MIS (Microprocessor mismatch)	<ul style="list-style-type: none"> • On the blade server light path diagnostics panel: The blade server microprocessors do not match. • On the MPE unit light path diagnostics panel: The MPE unit microprocessors do not match. 	Make sure that microprocessors 1 and 2 are identical (number of cores, cache size and type, clock speed, internal and external clock frequencies, and wattage); also, see “Troubleshooting tables” on page 89.

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 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
NMI (NMI error)	The system board has failed.	<ol style="list-style-type: none"> 1. Replace the blade server cover and reinsert the blade server in the BladeCenter unit; then, restart the blade server. Check the BMC log for information about the error (see “Error logs” on page 72). 2. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
S BRD (System board or MPE board error)	The system board or MPE board has failed.	<ul style="list-style-type: none"> • (Trained service technician only) If the lit LED is on the blade server light path diagnostics panel, replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62). • (Trained service technician only) If the lit LED is on the MPE unit light path diagnostics panel, replace the MPE board assembly (see “Removing the system-board assembly” on page 62 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 160). 2. Make sure that the room temperature is not too high. See “Features and specifications” on page 2 for temperature information.
SAS hard disk drive error	On the blade server system board: A blade-server hard disk drive has failed.	Run the hard disk drive diagnostic tests (see “Dynamic System Analysis diagnostic programs and messages”). If the drive passes the diagnostics test but the drive continues to have a problem, replace the hard disk drive with a new one (see “Removing a SAS drive” on page 35 and “Installing a SAS drive” on page 36).

Dynamic System Analysis diagnostic programs and messages

IBM Dynamic System Analysis (DSA) Preboot is a system information collection and analysis tool that is used by IBM service and support personnel to aid in the diagnosis of 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 that you should take as a result of the text message.

DSA collects information about the following aspects of a system:

- Drive health information
- Event logs for ServeRAID controllers and service processors
- Hardware inventory, including PCI and USB information
- IBM light path diagnostics status
- LSI RAID and controller configuration
- Network interfaces and settings
- Service processor status and configuration
- ServeRAID configuration
- System configuration
- Vital product data, firmware, and basic input/output system (BIOS) configuration

DSA also provides diagnostics for the following system components:

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

Additionally, DSA creates a merged log that includes events from all collected logs.

You can output all the collected information as a compressed XML file that you can send to IBM service and support, view the information locally through a generated text report file, or copy the generated HTML pages to removable media and view them in a Web browser. See “Running the diagnostic programs” for more information.

If you cannot find a problem by using the diagnostic programs, see “Solving undetermined problems” on page 164 for information about testing the blade server.

Running the diagnostic programs

Important: The DSA diagnostic programs do not support USB CD drives. If you run the DSA diagnostic programs while any USB CD drives are attached, ignore any optical drive test results that are returned for USB CD drives. You can also remove USB CD 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 (see “Turning off the blade server” on page 6).

2. Turn on all attached devices; then, turn on the blade server (see “Turning on the blade server” on page 5).
3. When the prompt Press F2 for Dynamic System Analysis (DSA) is displayed, press F2. If you have set both a power-on password and an administrator password, you must type the administrator password to run the diagnostic programs. The stand-alone memory diagnostic environment starts.
4. Select the tests that you want to run or select **Exit to DSA** to exit the stand-alone memory diagnostic environment.
Important: After you exit from the stand-alone memory diagnostic environment, you must restart the blade server to enter the stand-alone memory diagnostic environment again.
5. From the DSA main screen, select **gui** to display the graphical user interface, or select **cmd** to display the DSA interactive menu.
6. Follow the instructions on the screen to select the diagnostic test that you want to run.

When you are using the CPU stress tests or Memory stress tests, call service if you experience any system instability.

To determine what action you should take as a result of a diagnostic text message or error code, see the table in “Dynamic System Analysis diagnostic messages” on page 111.

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 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 93 for information about diagnosing microprocessor problems.

Diagnostic text messages

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

Passed: The test was completed without any errors.

Failed: The test detected an error.

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

Viewing the test log

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

- At the command line in the DSA interactive menu, type the **view** command, or in the DSA graphical user interface, select **Diagnostic Event Log**.

- From the DSA interactive menu, select **getextendedresults**.
- From the DSA interactive menu, select **view** to view all of the collected results and error log data.
- From the System Information page in the DSA graphical user interface, select **DSA Error Log**.

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.

Dynamic System Analysis diagnostic messages

The following table describes the messages that the DSA 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. When these numbers are in the central position of the code, they 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 <i>do not replace a CRU or a FRU</i> . |

Diagnostic error codes

Table 4. Diagnostic error codes

Message number	Component	Test	State	Description	Action
089-801-xxx	CPU	CPU Stress Test	Aborted	Internal program error.	<ul style="list-style-type: none"> 1. Turn off and restart the system. 2. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 3. Run the test again. 4. Make sure that the system firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 5. Run the test again. 6. Turn off and restart the system if necessary to recover from a hung state. 7. (Trained service technician only) Reseat the microprocessors (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). 8. Run the test again. 9. Replace the following components one at a time, in the order shown, and run this test again to determine whether the problem has been solved: <ul style="list-style-type: none"> a. (Trained service technician only) Microprocessors (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). b. (Trained service technician only) System-board assembly (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
089-802-xxx	CPU	CPU Stress Test	Aborted	System resource availability error.	<ol style="list-style-type: none"> Turn off and restart the system. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Run the test again. Make sure that the system firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. Turn off and restart the system if necessary to recover from a hung state. (Trained service technician only) Replace the microprocessors one at a time; then, run this test again to determine whether the problem has been solved (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.
089-803-000	CPU	CPU Stress Test	Abort	Test aborted.	<p>The memory size is insufficient to run the test. At least 1 GB of memory is required to run the tests.</p> <ol style="list-style-type: none"> Turn off and restart the system if necessary to recover from a hung state. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Run the test again.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
089-901-xxx	CPU	CPU Stress Test	Failed	Test failure.	<ol style="list-style-type: none"> Turn off and restart the system if necessary to recover from a hung state. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Run the test again. Make sure that the system firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1_MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. Turn off and restart the system if necessary to recover from a hung state. Run the test again. (Trained service technician only) Replace the microprocessors one at a time; then, run this test again to determine whether the problem has been solved (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
166-901-xxx	BMC	I2C Test	Failed	The BMC indicates a failure in the system memory	<ol style="list-style-type: none"> Reseat the blade server (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. (Trained service technician only) Reseat the microprocessors one at a time (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). Run the test again.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
166-902-xxx	BMC	BMC I2C Test	Failed	The BMC indicates a failure in the SIO bus.	<ol style="list-style-type: none"> Reseat the blade server (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. If the reported memory size is the same as the installed memory size, complete the following steps. <ol style="list-style-type: none"> Reseat all the memory DIMMs (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38). Run the test again. If the problem remains, replace the memory DIMMs one at a time (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38).

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
166-903-xxx	BMC	BMC I2C Test	Failed	The BMC indicates a failure in the LAN bus.	<ol style="list-style-type: none"> Reseat the blade server (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Make sure that the Ethernet device firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
166-904-xxx	BMC	BMC I2C Test	Failed	The BMC indicates a failure in LED or CPU temperature bus.	<ol style="list-style-type: none"> Reseat the blade server (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62). Run the test again.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
166-905-xxx	BMC	BMC I2C Test	Failed	The BMC indicates a failure in the VRD bus.	<ol style="list-style-type: none"> Reseat the blade server (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. (Trained service technician only) Reseat the microprocessors one at a time (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). Run the test again. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
166-906-xxx	BMC	BMC I2C Test	Fail	The BMC indicates a failure in the VPD, Power PSOC.	<ol style="list-style-type: none"> Reseat the blade server (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
166-919-xxx	BMC	BMC I2C Test	Failed	The BMC indicates a failure in bus.	<ol style="list-style-type: none"> Reseat the blade server (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
166-920-xxx	BMC	BMC I2C Test	Failed	The BMC indicates a failure in the BSE-3 bus.	<ol style="list-style-type: none"> Reseat the blade server (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).

Table 4. Diagnostic error codes (continued)

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
166-921-xxx	BMC	BMC I2C Test	Failed	The BMC indicates a failure in the memory card 3 light path diagnostics bus.	<ol style="list-style-type: none"> 1. Reseat the blade server (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Run the test again. 3. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 4. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 5. Run the test again. 6. (Trained service technician only) Replace the system board (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
166-922-xxx	BMC	BMC I2C Test	Failed	The BMC indicates a failure in the onboard legacy daughter card.	<ol style="list-style-type: none"> Reseat the blade server (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the BMC firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. (Trained service technician only) Replace the system board (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).
201-000-xxx	Memory	Memory Test	Test Pass		The memory passed the test. No action is required.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
201-811-xxx	Memory	Memory Test	Abort	Test aborted: Unable to locate _SM_ key when locating SMBIOS structure data	<ol style="list-style-type: none"> Reseat the blade server (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1_MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. Reseat the memory modules (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38). Replace the failing DIMMs (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38).

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
201-812-xxx	Memory	Memory Test	Abort	Test aborted: SMBIOS type 0 structure indicates invalid machine ID that is not supported.	<ol style="list-style-type: none"> Turn off and restart the system. Run the test again. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1_MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. Verify the settings in the Setup Utility program (see "Using the Setup Utility program" on page 11). Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Run the test again.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
201-813-xxx	Memory	Memory Test	Abort	Test aborted: CPU n: Cannot turn off error reporting	<ol style="list-style-type: none"> Turn off and restart the system. Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. Reseat the memory modules (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38). Run the test again. (Trained service technician only) Reseat the microprocessors (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). Replace the failing DIMMs (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38).

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
201-814-xxx	Memory	Memory Test	Abort	Test aborted: CPU n: Cannot disable scrubbing.	<ol style="list-style-type: none"> Turn off and restart the system. Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1_MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.
201-815-xxx	Memory	Memory Test	Abort	Test aborted: Program error: Quick Memory Menu Item selection problem.	<ol style="list-style-type: none"> Turn off and restart the system. Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1_MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
201-816-xxx	Memory	Memory Test	Abort	Test aborted: Program error: Quick Memory Menu Item selection problem.	<ol style="list-style-type: none"> Turn off and restart the system. Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.
201-818-xxx	Memory	Memory Test	Abort	Test aborted: Unable to locate _SM_ key when locating SMBIOS structure data	<ol style="list-style-type: none"> Turn off and restart the system. Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
201-819-xxx	Memory	Memory Test	Abort	Test aborted: START-END address ranges in the restricted area of memory.	<ol style="list-style-type: none"> Turn off and restart the system. Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1_MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.
201-824-xxx	Memory	Memory Test	Abort	Test aborted: Node Interleave must be off.	<ol style="list-style-type: none"> Turn off and restart the system. Run the Setup Utility program (see "Using the Setup Utility program" on page 11). Turn off Node Interleave. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1_MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.

Table 4. Diagnostic error codes (continued)

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
201-826-xxx	Memory	Memory Test	Abort	Test aborted: Memory controller is disabled.	<ol style="list-style-type: none"> 1. Turn off and restart the system. 2. Run the Setup Utility program (see “Using the Setup Utility program” on page 11). 3. Enable the memory controller. 4. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware. 5. Run the test again. 6. See “Solving undetermined problems” on page 164.
201-827-xxx	Memory	Memory Test	Abort	Test aborted: ECC feature is disabled.	<ol style="list-style-type: none"> 1. Turn off and restart the system. 2. Run the Configuration/Setup Utility program (see “Using the Setup Utility program” on page 11). 3. Enable ECC generation. 4. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware. 5. Run the test again. 6. See “Solving undetermined problems” on page 164.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
201-831-xxx 201-832-xxx 201-833-xxx 201-834-xxx 201-835-xxx	Memory	Memory Test	Abort	Test aborted: Cannot mask MSR machine check control MASK registers.	<ol style="list-style-type: none"> Turn off and restart the system. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1_MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.
201-836-xxx 201-837-xxx 201-838-xxx 201-839-xxx 201-840-xxx	Memory	Memory Test	Abort	Test aborted: Cannot clear MSR machine check control MASK registers.	<ol style="list-style-type: none"> Turn off and restart the system. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1_MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
201-877-xxx	Memory	Memory Test	Abort	Test aborted: Sparing must be turned off in extended PCI space.	<ol style="list-style-type: none"> Turn off and restart the system. Run the Configuration/Setup Utility program (see "Using the Setup Utility program" on page 11). Disable memory sparing. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.
201-878-xxx	Memory	Memory Test	Abort	Test aborted: Sparing is enabled in PCI space.	<ol style="list-style-type: none"> Turn off and restart the system. Run the Configuration/Setup Utility program (see "Using the Setup Utility program" on page 11). Disable memory sparing. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1 MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
201-885-xxx	Memory	Memory Test	Abort	Test aborted: CPU does not support MTRR functions, cannot uncache available memory space.	<ol style="list-style-type: none"> Turn off and restart the system. Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.
201-886-xxx	Memory	Memory Test	Abort	Test aborted: E820 function call indicates not enough memory available for testing.	<ol style="list-style-type: none"> Turn off and restart the system. Run the test again. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. See "Solving undetermined problems" on page 164.
201-889-xxx	Memory	Memory Test	Abort	User abort.	The test was terminated by the user before completion. Run the test again.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
201-901-xxx	Memory	Memory Test	Failed	Memory test failed: single-bit error in DIMMs: PnDimmx or multiple-bit error in DIMMs: PnDimmx PnDimmy Where: n=[1 - 4] x=[1 - 4] y=[1 - 4]	<ol style="list-style-type: none"> Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. Reseat the failing DIMMs (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38). Run the test again. Replace the failing DIMMs (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38). Enable all memory in the Configuration/Setup Utility program (see "Using the Setup Utility program" on page 11). Run the test again. See "Solving undetermined problems" on page 164.
202-000-xxx	Memory	Memory Stress Test	Pass		The memory passed the test. No action is required.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
202-801-xxx	Memory	Memory Stress Test	Aborted	Internal program error.	<ol style="list-style-type: none"> Turn off and restart the system. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Make sure that the system BIOS code is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. Turn off and restart the system if necessary to recover from a hung state. Run the memory diagnostics to identify the specific failing DIMM. Reseat the failing DIMMs (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38). Run the test again. Replace the failing DIMMs (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38). See "Solving undetermined problems" on page 164.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
202-802-xxx	Memory	Memory Stress Test	Abort	Test aborted. Memory size is insufficient to run the test. At least 1 GB of memory is required to run the test.	<ol style="list-style-type: none"> Turn off and restart the system. Run the test again. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Run the test again. Run the standard memory test to validate all memory. See "Solving undetermined problems" on page 164.
202-901-xxx	Memory	Memory Stress Test	Failed	Test failure.	<ol style="list-style-type: none"> Run the standard memory test to validate all memory. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. Reseat the DIMMs (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38). Run the test again. Run the standard DSA memory diagnostic to validate all memory. See "Solving undetermined problems" on page 164.
215-000-xxx	Optical drive	Self-test	Pass		The optical drive passed the test. No action is required.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
215-801-xxx	Optical drive	Self-test	Aborted	Unable to communicate with the device driver.	<ol style="list-style-type: none"> 1. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 2. Run the test again. 3. Check the drive cabling at both ends for loose or broken connections or damage to the cable. Replace the cable if it is damaged. 4. Run the test again. 5. For additional troubleshooting information, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559. 6. Run the test again. 7. Make sure that the system firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 8. Run the test again. 9. Replace the CD or DVD drive (see the documentation for your optical drive or BladeCenter unit). 10. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.

Table 4. Diagnostic error codes (continued)

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
215-802-xxx	Optical drive	Verify media installed	Aborted	The media tray is open.	<ol style="list-style-type: none"> 1. Close the media tray and wait 15 seconds. 2. Run the test again. 3. Insert a new CD or DVD into the drive and wait for 15 seconds for the media to be recognized. 4. Run the test again. 5. Check the drive cabling at both ends for loose or broken connections or damage to the cable. Replace the cable if it is damaged. 6. Run the test again. 7. Make sure that the DSA code is at the latest level. For the latest level of DSA code, go to http://www.ibm.com/support/docview.wss?uid=psg1SERV-DSA. 8. Run the test again. 9. For additional troubleshooting information, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559. 10. Run the test again. 11. Replace the CD or DVD 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, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
215-902-xxx	Optical drive	Read/Write test	Failed	Read miscompare	<ol style="list-style-type: none"> 1. Insert a CD or DVD into the drive or try a new media, and wait for 15 seconds. 2. Run the test again. 3. Check the drive cabling at both ends for loose or broken connections or damage to the cable. Replace the cable if it is damaged. 4. Run the test again. 5. For additional troubleshooting information, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-41559. 6. Run the test again. 7. Replace the CD or DVD drive. 8. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.
217-000-xxx	Hard disk drive	Hard disk drive self test	Passed		The device passed the test. No action is required.
217-800-000	Hard disk drive	Hard disk drive self test	Abort		The device passed the test. No action is required.
217-900-000	Hard disk drive	Hard disk drive self test	Passed		The device passed the test. No action is required.
405-001-xxx	Broadcom Ethernet device	Test MII registers	Passed		The device passed the test. No action is required.
405-002-xxx	Broadcom Ethernet device	Test EEPROM	Passed		The device passed the test. No action is required.
405-003-xxx	Broadcom Ethernet device	Test InternalM	Passed		The device passed the test. No action is required.
405-004-xxx	Broadcom Ethernet device	Test Interrupt	Passed		The device passed the test. No action is required.

Table 4. Diagnostic error codes (continued)

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
405-005-xxx	Broadcom Ethernet device	Test loopback at MAC layer	Passed		The device passed the test. No action is required.
405-006-xxx	Broadcom Ethernet device	Test loopback at physical layer	Passed		The device passed the test. No action is required.
405-007-xxx	Broadcom Ethernet device	Test LEDs	Passed		The device passed the test. No action is required.
405-901-xxx	Broadcom Ethernet device	Test control registers	Failed		<ol style="list-style-type: none"> 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 2. Run the test again. 3. Replace the component that is causing the error. The I/O board contains this component. If the error is caused by an adapter, replace the adapter. Check the PCI Information and Network Settings information in the DSA event log to determine the physical location of the failing component. 4. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
405-901-xxx	Broadcom Ethernet device	Test MII registers	Failed		<ol style="list-style-type: none"> Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. Replace the component that is causing the error. The I/O board contains this component. If the error is caused by an adapter, replace the adapter. Check the PCI Information and Network Settings information in the DSA event log to determine the physical location of the failing component. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.

Table 4. Diagnostic error codes (continued)

<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 3, “Parts listing, Types 7901 and 7902,” on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
405-902-xxx	Broadcom Ethernet device	Test EEPROM	Failed		<ol style="list-style-type: none"> 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 2. Run the test again. 3. Replace the component that is causing the error. The I/O board contains this component. If the error is caused by an adapter, replace the adapter. Check the PCI Information and Network Settings information in the DSA event log to determine the physical location of the failing component. 4. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
405-903-xxx	Broadcom Ethernet device	Test internal memory	Failed		<ol style="list-style-type: none"> Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. Check the interrupt assignments in the PCI Hardware section of the DSA event log. If the Ethernet device is sharing interrupts, if possible, use the Configuration/Setup Utility program (see "Using the Setup Utility program" on page 11) to assign a unique interrupt to the device. Replace the component that is causing the error. The I/O board contains this component. If the error is caused by an adapter, replace the adapter. Check the PCI Information and Network Settings information in the DSA event log to determine the physical location of the failing component. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
405-904-xxx	Broadcom Ethernet device	Test interrupt	Failed		<ol style="list-style-type: none"> Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. Check the interrupt assignments in the PCI Hardware section of the DSA event log. If the Ethernet device is sharing interrupts, if possible, use the Configuration/Setup Utility program (see "Using the Setup Utility program" on page 11) to assign a unique interrupt to the device. Replace the component that is causing the error. The I/O board contains this component. If the error is caused by an adapter, replace the adapter. Check the PCI Information and Network Settings information in the DSA event log to determine the physical location of the failing component. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.
405-905-xxx	Broadcom Ethernet device	Test interrupt	Pass		The device passed the test. No action is required.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
405-906-xxx	Broadcom Ethernet device	Test loopback at physical layer	Failed		<ol style="list-style-type: none"> 1. Check the Ethernet cable for damage and make sure that the cable type and connection are correct. 2. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 3. Run the test again. 4. Replace the component that is causing the error. The I/O board contains this component. If the error is caused by an adapter, replace the adapter. Check the PCI Information and Network Settings information in the DSA event log to determine the physical location of the failing component. 5. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
405-906-xxx	Broadcom Ethernet device	Test loopback at MAC layer	Failed		<ol style="list-style-type: none"> 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 2. Run the test again. 3. Replace the component that is causing the error. The I/O board contains this component. If the error is caused by an adapter, replace the adapter. Check the PCI Information and Network Settings information in the DSA event log to determine the physical location of the failing component. 4. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.

Table 4. Diagnostic error codes (continued)

<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 3, "Parts listing, Types 7901 and 7902," on page 19 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 					
Message number	Component	Test	State	Description	Action
405-907-xxx	Broadcom Ethernet device	Test LEDs	Failed		<ol style="list-style-type: none"> Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. Run the test again. Replace the component that is causing the error. The I/O board contains this component. If the error is caused by an adapter, replace the adapter. Check the PCI Information and Network Settings information in the DSA event log to determine the physical location of the failing component. If the failure remains, collect the data from the DSA event log and send it to IBM Service. For information about contacting and sending data to IBM Service, see http://www.ibm.com/support/docview.wss?uid=psg1SERVCALL.

Table 4. Diagnostic error codes (continued)

Message number	Component	Test	State	Description	Action
405-908-xxx	Broadcom Ethernet device	Test LEDs	Fail		<ul style="list-style-type: none"> 1. Make sure that the component firmware is at the latest level. The installed firmware level is shown in the DSA event log in the Firmware/VPD section for this component. For the latest level of firmware, go to http://www.ibm.com/support/docview.wss?uid=psg1MIGR-4JTS2T and select your system to display a matrix of available firmware. 2. Run the test again. 3. Replace the component that is causing the error. The I/O board contains this component. If the error is caused by an adapter, replace the adapter. Check the PCI Information and Network Settings information in the DSA event log to determine the physical location of the failing component. 4. See "Solving undetermined problems" on page 164.

Additional diagnostic error codes

Table 5. Additional diagnostic error codes

Error code	Description	Action
001-xxx-001	Failed core tests	(Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).
005-xxx-000	Failed video test	(Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).

Table 5. Additional diagnostic error codes (continued)

Error code	Description	Action
030-xxx-000	Failed internal SAS interface test	(Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).
035-xxx-099	No adapters were found	If a PCI-X or PCIe adapter is installed in the blade server or the MPE unit, reseal the adapter (see "Removing an I/O expansion card" on page 39 and "Installing an I/O expansion card" on page 43).
075-xxx-000	Failed power supply test	Replace the power supply (see the <i>Hardware Maintenance Manual and Troubleshooting Guide</i> or the <i>Problem Determination and Service Guide</i> for your BladeCenter unit).

Table 5. Additional diagnostic error codes (continued)

Error code	Description	Action
089-xxx-00n	Failed microprocessor test	<ul style="list-style-type: none"> 1. Make sure that the latest firmware updates have been installed (see "Firmware updates" on page 17). 2. Reseat the following components: <ul style="list-style-type: none"> a. (Trained service technician only) Blade server microprocessor 1 if $n = 0$ or 1 (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). b. (Trained service technician only) Blade server microprocessor 2 if $n = 2$ or 3 (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). c. (Trained service technician only) MPE microprocessor 1 if $n = 4$ or 5 (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). d. (Trained service technician only) MPE microprocessor 2 if $n = 6$ or 7 (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). 3. Replace the following components one at a time, in the order shown, restarting the blade server each time: <ul style="list-style-type: none"> a. (Trained service technician only) Blade server microprocessor 1 if $n = 0$ or 1 (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). b. (Trained service technician only) Blade server microprocessor 2 if $n = 2$ or 3 (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). c. (Trained service technician only) MPE microprocessor 1 if $n = 4$ or 5 (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59). d. (Trained service technician only) MPE microprocessor 2 if $n = 6$ or 7 (see "Removing a microprocessor and heat sink" on page 57 and "Installing a microprocessor and heat sink" on page 59).

Table 5. Additional diagnostic error codes (continued)

<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 Table 1 on page 21 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 		
Error code	Description	Action
165-060-000	Service Processor: Advanced System Management (ASM) may be busy	<ol style="list-style-type: none"> 1. Run the diagnostic test again (see “Running the diagnostic programs” on page 109). 2. Correct the other error conditions that might be keeping the Advanced System Management (ASM) network or components busy. See the error log and diagnostic panel (see “Viewing the test log” on page 110). 3. Turn off the blade server and reseal it in the BladeCenter unit (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 4. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
165-198-000	Service Processor: Aborted	<ol style="list-style-type: none"> 1. Run the diagnostic test again (see “Running the diagnostic programs” on page 109). 2. Correct the other error conditions that might be keeping the Advanced System Management (ASM) network or components busy. See the error log and diagnostic panel (see “Viewing the test log” on page 110). 3. Turn off the blade server and reseal it in the BladeCenter unit (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 4. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
165-201-000	Service Processor: Failed	<ol style="list-style-type: none"> 1. Turn off the blade server and reseal it in the BladeCenter unit (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
165-330-000	Service Processor: Failed	Update the ROM diagnostic to the latest level and run diagnostics again (see “Firmware updates” on page 17).

Table 5. Additional diagnostic error codes (continued)

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 Table 1 on page 21 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.
165-342-000	Service Processor: Failed	<ol style="list-style-type: none"> 1. Make sure the latest firmware levels for Advanced System Management (ASM) and BIOS are installed (see “Firmware updates” on page 17). 2. Turn off the blade server and reseal it in BladeCenter unit (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
166-198-00x	System Management: Aborted	<ol style="list-style-type: none"> 1. Remove the blade server from BladeCenter unit, wait 30 seconds, and reseal it in the BladeCenter unit; then run the test again (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Update the BMC firmware and run the test again (see “Firmware updates” on page 17). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
166-403-001	System Management: Failed (BMC indicates failure in I2C bus test)	<ol style="list-style-type: none"> 1. Remove the blade server from the BladeCenter unit, wait 30 seconds, and reseal it in the BladeCenter unit; then, run the test again (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Update the BMC firmware and run the test again (see “Firmware updates” on page 17). 3. Update the Ethernet firmware and run the test again (see “Firmware updates” on page 17). 4. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).

Table 5. Additional diagnostic error codes (continued)

<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 Table 1 on page 21 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician. 		
Error code	Description	Action
166-419-001	System Management: Failed (BMC indicates failure in I2C bus test)	<ol style="list-style-type: none"> 1. Remove the blade server from the BladeCenter unit, wait 30 seconds, and reseal it in the BladeCenter unit; then, run the test again (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Update the BMC firmware and run the test again (see “Firmware updates” on page 17). 3. Remove the MPE unit (see “Removing an expansion unit” on page 31 and “Installing the blade server cover” on page 30). 4. Run the test again (see “Running the diagnostic programs” on page 109). 5. (Trained service technician only) If the error does not repeat, replace the MPE board (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62). 6. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
166-420-001	System Management: Failed (BMC indicates failure in I2C bus test)	<ol style="list-style-type: none"> 1. Remove the blade server from the BladeCenter unit, wait 30 seconds, and reseal it in the BladeCenter unit; then, run the test again (see “Removing the blade server from a BladeCenter unit” on page 27 and “Installing the blade server in a BladeCenter unit” on page 28). 2. Update the BMC firmware and run the test again (see “Firmware updates” on page 17). 3. (Trained service technician only) Replace the system-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).

Table 5. Additional diagnostic error codes (continued)

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 Table 1 on page 21 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). If an action step is preceded by "(Trained service technician only)," that step must be performed only by a trained service technician. 	
166-421-001	System Management: Failed (BMC indicates failure in I2C bus test)	<ol style="list-style-type: none"> Remove the blade server from the BladeCenter unit, wait 30 seconds, and reseal it in the BladeCenter unit; then run the test again (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Update the BMC firmware and run the test again (see "Firmware updates" on page 17). Remove the high-speed adapter (if installed) and run the test again. If the error does not repeat, replace the high-speed adapter (see "Removing an I/O expansion card" on page 39 and "Installing an I/O expansion card" on page 43). (Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).
166-nnn-001	System Management: Failed. BMC indicates failure in self test. Note: <ol style="list-style-type: none"> nnn = 300 to 320 nnn = 400 to 424 (excluding 403 and 419 to 422) 	<ol style="list-style-type: none"> Remove the blade server from BladeCenter unit, wait 30 seconds, and reseal it in the BladeCenter unit; then, run the test again (see "Removing the blade server from a BladeCenter unit" on page 27 and "Installing the blade server in a BladeCenter unit" on page 28). Update the BMC firmware and run the test again (see "Firmware updates" on page 17). (Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).
180-xxx-000	Diagnostics LED failure.	Run the LED test in the diagnostics program.
180-xxx-001	Failed front LED panel test.	<ol style="list-style-type: none"> Reseat the control panel connector (see "Removing the bezel assembly" on page 33 and "Installing the bezel assembly" on page 34). Replace the bezel assembly (see "Removing the bezel assembly" on page 33 and "Installing the bezel assembly" on page 34). (Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).
180-xxx-002	Failed diagnostics LED panel test.	(Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).

Table 5. Additional diagnostic error codes (continued)

Error code	Description	Action
180-xxx-003	Failed system board LED test.	(Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).
201-198-xxx	Memory test aborted. See Diagnostics logs.	<ol style="list-style-type: none"> 1. Restart the server (see "Turning off the blade server" on page 6 and "Turning on the blade server" on page 5). 2. Run the diagnostic test again (see "Running the diagnostic programs" on page 109). 3. Reinstall the diagnostic program (see "Firmware updates" on page 17). 4. See the error log for additional information.
201-199-xxx	Unexpected error. Test aborted. See Diagnostics logs.	<ol style="list-style-type: none"> 1. Restart the server (see "Turning off the blade server" on page 6 and "Turning on the blade server" on page 5). 2. Run the diagnostic test again (see "Running the diagnostic programs" on page 109). 3. Reinstall the diagnostic program (see "Firmware updates" on page 17). 4. See the error log for additional information.
201-xxx-PBD	Test failed. <ul style="list-style-type: none"> • P = CPU Number (1 - 4) • B = Failing bank/pair number • D = Failing DIMM number within failing CPU # P • D = 9: Both DIMMs in the failing bank/pair of DIMMs 	<ol style="list-style-type: none"> 1. Reseat the failing DIMMs; then, run the memory diagnostic test again (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38). 2. Replace the failing DIMMs (see "Removing a memory module" on page 37 and "Installing a memory module" on page 38); then, run the memory diagnostic test again. 3. (Trained service technician only) Replace the system-board assembly (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).

Table 5. Additional diagnostic error codes (continued)

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 Table 1 on page 21 to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU). • If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.
202-xxx-00n	Failed system cache test.	<ol style="list-style-type: none"> 1. (Trained service technician only) Reseat microprocessor <i>n</i> (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). 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 <i>n</i> (see “Removing a microprocessor and heat sink” on page 57 and “Installing a microprocessor and heat sink” on page 59). b. (Trained service technician only) MPE board assembly, if microprocessor <i>n</i> is on the MPE (see “Removing an expansion unit” on page 31 and “Installing an expansion unit” on page 32). c. (Trained service technician only) System board, if microprocessor <i>n</i> is on the blade server (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
217-198-xxx	Could not establish drive parameters.	<ol style="list-style-type: none"> 1. Reseat hard disk drive <i>x</i> (see “Removing a SAS drive” on page 35 and “Installing a SAS drive” on page 36). 2. Update the BIOS code (see “Firmware updates” on page 17). 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. Hard disk drive <i>x</i> (see “Removing a SAS drive” on page 35 and “Installing a SAS drive” on page 36). b. (Trained service technician only) System-board assembly (see “Removing the system-board assembly” on page 62 and “Installing the system-board assembly” on page 62).
217-xxx-000	Failed hard disk drive test. Note: If RAID is configured, the SAS Attached Disk number refers to the RAID logical drive.	<ol style="list-style-type: none"> 1. Reseat hard disk drive 1 (see “Removing a SAS drive” on page 35 and “Installing a SAS drive” on page 36). 2. Replace hard disk drive 1 (see “Removing a SAS drive” on page 35 and “Installing a SAS drive” on page 36).

Table 5. Additional diagnostic error codes (continued)

Error code	Description	Action
217-xxx-001	Failed hard disk drive test. Note: If RAID is configured, the SAS Attached Disk number refers to the RAID logical drive.	<ol style="list-style-type: none"> 1. Reseat hard disk drive 2 (see "Removing a SAS drive" on page 35 and "Installing a SAS drive" on page 36). 2. Replace hard disk drive 2 (see "Removing a SAS drive" on page 35 and "Installing a SAS drive" on page 36).
405-xxx-xxx	Failed Ethernet test on controller on system board.	<ol style="list-style-type: none"> 1. Download and install the latest firmware updates for the blade server (see "Firmware updates" on page 17). 2. Make sure that Ethernet is not disabled in the "Setup Utility" program (see "Configuring the Gigabit Ethernet controller" on page 17). 3. (Trained service technician) Replace the system-board assembly (see "Removing the system-board assembly" on page 62 and "Installing the system-board assembly" on page 62).

Recovering from a BIOS update failure

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

The flash memory of the blade server consists of a primary page and a backup page. If the BIOS code in the primary page is damaged, the baseboard management controller will detect the error and automatically switch to the backup page to start the blade server. If this happens, a POST message Booted from backup POST/BIOS image is displayed. The backup page version 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 update.

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. Download the latest version of the BIOS code from <http://www.ibm.com/bladecenter/>.
2. Update the BIOS code, following the instructions that come with the update file that you downloaded. This automatically restores and updates the primary page.
3. Restart the blade server.

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

1. Read the safety information that begins on page “Safety statements” on page viii and “Handling static-sensitive devices” on page 26.
2. Turn off the blade server (see “Turning off the blade server” on page 6).
3. Remove the blade server from the BladeCenter unit (see “Removing the blade server from a BladeCenter unit” on page 27).
4. Remove the cover (see “Removing the blade server cover” on page 29).
5. If an MPE unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
6. Locate switch block SW4 on the system board (see “System-board switches” on page 8).
7. Move the BIOS backup page switch (SW4-2) to the closed position to enable the backup page.
8. Install the MPE unit or expansion unit, if you removed one to access SW4 (see “Installing an expansion unit” on page 32).
9. Install the cover and reinstall the blade server in the BladeCenter unit, making sure that the blade server is connected to the media tray (see “Installing the blade server cover” on page 30).
10. Insert the BIOS flash diskette into the diskette drive.
11. Turn on the blade server (see “Turning on the blade server” on page 5). The power-on self-test (POST) starts.
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 “Removing the blade server from a BladeCenter unit” on page 27).
18. Remove the cover of the blade server (see “Removing the blade server cover” on page 29).
19. If an MPE unit is installed, remove the MPE unit (see “Removing an expansion unit” on page 31).
20. Move switch SW4-2 to the open position to return to the normal startup mode (see “System-board switches” on page 8).
21. Install the MPE unit or expansion unit, if you removed one to access SW4 (see “Installing an expansion unit” on page 32).
22. Install the cover and reinstall the blade server in the BladeCenter unit (see “Installing the blade server in a BladeCenter unit” on page 28).
23. Turn on the blade server (see “Turning on the blade server” on page 5).

Service processor (BMC) error codes

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

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

Solving SAS hard disk drive problems

For any SAS error message, one or more of the following devices might be causing the problem:

- A failing SAS device (adapter, drive, or controller)
- An incorrect SAS configuration

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

Solving shared BladeCenter resource problems

Problems with BladeCenter shared resources might appear to be in the blade server. The following sections provide procedures to help you isolate blade server problems from shared BladeCenter resource problems. If the problem is thought to be with a shared resource, see the *Problem Determination and Service Guide* or the *Hardware Maintenance Manual and Troubleshooting Guide* for your BladeCenter unit and other BladeCenter component documentation for additional information. If the problem cannot be solved, see “Solving undetermined problems” on page 164.

To check the general function of shared BladeCenter resources, complete the following procedures:

1. 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.
2. 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.
3. Try the blade server in a different blade bay.
4. Try a known-good blade server in the blade bay.

Keyboard or mouse problems

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

1. Make sure that the following conditions are met:
 - Both the blade server and the monitor are turned on.

- The KVM 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 (see “Blade server controls and LEDs” on page 3).
 - 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 91.

Media tray problems

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

1. Make sure that the following conditions are met:
 - 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 (see “Blade server controls and LEDs” on page 3).
 - The media tray devices work with another blade server.
2. Determine whether the problem affects more than one media tray component:
 - USB ports
 - Removable media drives
3. For problems affecting only a USB port, complete the following steps:
 - 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.

Note: See the documentation for your BladeCenter unit for removal and installation procedures.

- 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.

Note: See the documentation for your BladeCenter unit for removal and installation procedures.

- 1) USB cable (if applicable)
- 2) Media tray cable (if applicable)
- 3) Media tray

- d. Continue with step 7.
4. For problems that affect only the diskette drive, complete the following steps:
 - a. Continue with step 6.
5. For problems that affect only the CD or DVD drive, complete the following steps:
 - a. Make sure that the software program is working properly.
 - b. Continue with step 6.
6. For problems that affect one or more of the removable media drives, complete the following steps:
 - a. If there is removable media in the drive, make sure that the following conditions are met:
 - The removable media 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 removable media.
 - The media is good and not damaged; the drive LED light flashes once per second when the disk is inserted.
 - The media contains the necessary files to start the blade server.
 - The software program is working properly.
 - The distance between monitors and drives is at least 76 mm (3 in.).
 - b. Reseat the following components.

Note: See the documentation for your BladeCenter unit for removal and installation procedures.

- 1) Removable-media drive cable (if applicable)
 - 2) Removable-media drive
 - 3) Media tray cable (if applicable)
 - 4) Media tray
- c. Replace the following components one at a time, in the order shown, restarting the blade server each time.

Note: See the documentation for your BladeCenter unit for removal and installation procedures.

- 1) Removable-media drive cable (if applicable)
- 2) Media tray cable (if applicable)
- 3) Removable-media drive
- 4) Media tray

- d. Continue with step 7.
7. Check for correct management-module operation (see the documentation for your BladeCenter unit).

Note: Some BladeCenter unit types have several management-module components that might 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 100 or “Universal Serial Bus (USB) port problems” on page 103.

Network connection problems

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

1. Make sure that the following conditions are met:
 - The network cables are securely connected to the I/O-module.
 - Power configuration of the BladeCenter unit supports the I/O module configuration.
 - Installation of the I/O-module type is supported by the BladeCenter unit and blade server hardware.
 - The I/O modules for the network interface that is being used are installed in the correct BladeCenter bays, and are configured and operating correctly.
 - The settings in the I/O module are correct for the blade server (settings in the I/O module are specific to each blade server).
2. Check for correct I/O-module operation; troubleshoot and replace the I/O module as indicated in the documentation for the I/O module.
3. Check for correct management-module operation (see the documentation for your BladeCenter unit).

Note: Some BladeCenter unit types have several management-module components that might 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 94.

Power problems

To check for power problems, make sure that the following conditions are met:

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

If these procedures do not solve the problem, it is likely a problem with the blade server. See “Power error messages” on page 95 and “Power problems” on page 98.

Video problems

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

1. Make sure that the following conditions are met:
 - Both the blade server and the monitor are turned on, and the monitor brightness and contrast controls are correctly adjusted.
 - The KVM select button LED on the front of the blade server is lit, indicating that the blade server is connected to the shared BladeCenter monitor (see “Blade server controls and LEDs” on page 3).
 - 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 93.

Solving undetermined problems

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

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

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

If you suspect that a software problem is causing failures (continuous or intermittent), see “Software problems” on page 103.

Damaged data in CMOS memory or damaged BIOS code can cause undetermined problems. To reset the CMOS data, remove and replace the battery to override the power-on password and clear the CMOS memory; see “Removing the battery” on page 48 and “Installing the battery” on page 48. If you suspect that the BIOS code is damaged, see “Recovering from a BIOS update failure” on page 158.

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 7 for the location of the connector).
2. If no LEDs on the control panel are working, replace the bezel assembly (see “Removing the bezel assembly” on page 33 and “Installing the bezel assembly” on page 34); 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 (see “Turning off the blade server” on page 6).
4. Remove the blade server from the BladeCenter unit and remove the cover (see “Removing the blade server from a BladeCenter unit” on page 27 and “Removing the blade server cover” on page 29).
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.
 - MPE unit, if one is installed (see “Removing an expansion unit” on page 31)
 - I/O-expansion cards (see “Removing an I/O expansion card” on page 39)
 - Hard disk drive (see “Removing a SAS drive” on page 35)
 - Memory modules (see “Removing a memory module” on page 37). The minimum configuration requirement is 2 GB (two 1 GB DIMMs on the system board).

The following minimum configuration is required for the blade server to start:

- System-board assembly
 - One microprocessor
 - Two 1 GB DIMMs
 - A functioning BladeCenter unit
6. Install and turn on the blade server (see “Turning on the blade server” on page 5). If the problem remains, suspect the following components in the following order:
 - a. DIMM
 - b. Microprocessor
 - c. System-board assembly

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

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 symptom
 - Does the blade server fail the diagnostic test?
 - What occurs? When? Where?
 - Does the failure occur on a single blade server or on multiple blade 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?
- Diagnostics 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 blade 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 blade servers:

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

See “Getting help and technical assistance,” on page 167 for information about calling IBM for service.

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. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the IBM Documentation CD that comes with your system.
- Go to the IBM support Web site at <http://www.ibm.com/systems/support/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

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

Using the documentation

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

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM systems, optional devices, services, and support. The address for IBM System x[®] and xSeries[®] information is <http://www.ibm.com/systems/x/>. The address for IBM BladeCenter[®] information is <http://www.ibm.com/systems/bladecenter/>. The address for IBM IntelliStation[®] information is <http://www.ibm.com/intellistation/>.

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

Software service and support

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

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

Hardware service and support

You can receive hardware service through your IBM reseller or IBM Services. To locate a reseller authorized by IBM to provide warranty service, go to <http://www.ibm.com/partnerworld/> and click **Find a Business Partner** on the right side of the page. For IBM support telephone numbers, see <http://www.ibm.com/planetwide/>. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

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

IBM Taiwan product service

台灣 IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

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

Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

*IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.*

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product, and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol ([®] or [™]), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common

law trademarks in other countries. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at <http://www.ibm.com/legal/copytrade.shtml>.

Adobe and PostScript are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc., in the United States, other countries, or both and is used under license therefrom.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc., in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, or service names may be trademarks or service marks of others.

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.

IBM makes no representation or warranties regarding non-IBM products and services that are ServerProven[®], including but not limited to the implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

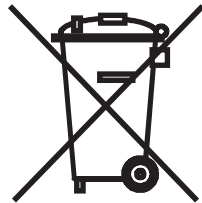
IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

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

Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/index.shtml>.

Esta unidad debe reciclarse o desecharse de acuerdo con lo establecido en la normativa nacional o local aplicable. IBM recomienda a los propietarios de equipos de tecnología de la información (TI) que reciclen responsablemente sus equipos cuando éstos ya no les sean útiles. IBM dispone de una serie de programas y servicios de devolución de productos en varios países, a fin de ayudar a los propietarios de equipos a reciclar sus productos de TI. Se puede encontrar información sobre las ofertas de reciclado de productos de IBM en el sitio web de IBM <http://www.ibm.com/ibm/environment/products/index.shtml>.



Notice: This mark applies only to countries within the European Union (EU) and Norway.

This appliance is labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

この機器には、EU 諸国に対する廃電気電子機器指令 2002/96/EC(WEEE) のラベルが貼られています。この指令は、EU 諸国に適用する使用済み機器の回収とリサイクルの骨子を定めています。このラベルは、使用済みになった時に指令に従って適正な処理をする必要があることを知らせるために種々の製品に貼られています。

Remarque : Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

L'étiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers

l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

Battery return program

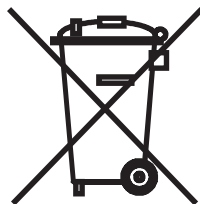
This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area.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

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

For Taiwan: Please recycle batteries.



For the European Union:



Notice: This mark applies only to countries within the European Union (EU).

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and

recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

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

バッテリーあるいはバッテリー用のパッケージには、EU 諸国に対する廃電気電子機器指令 2006/66/EC のラベルが貼られています。この指令は、バッテリーと蓄電池、および廃棄バッテリーと蓄電池に関するものです。この指令は、使用済みバッテリーと蓄電池の回収とリサイクルの骨子を定めているもので、EU 諸国にわたって適用されます。このラベルは、使用済みになったときに指令に従って適正な処理をする必要があることを知らせるために種々のバッテリーに貼られています。

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury, and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and treatment of batteries and accumulators. Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local IBM representative.

This notice is provided in accordance with Royal Decree 106/2008 of Spain: The retail price of batteries, accumulators, and power cells includes the cost of the environmental management of their waste.

For California:

Perchlorate material – special handling may apply. See <http://www.dtsc.ca.gov/hazardouswaste/perchlorate/>.

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

Electronic emission notices

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in

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

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

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

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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

United Kingdom telecommunications safety requirement

Notice to Customers

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

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 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.

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

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

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

Taiwanese Class A warning statement

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

Chinese Class A warning statement

聲 明
此為 A 級產品。在生活環境中，
該產品可能會造成無線電干擾。
在這種情況下，可能需要用戶對其
干擾採取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

この装置は、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

Korean Class A Warning Statement

이 기기는 업무용으로 전자파 적합등록을 받은 기기
이오니, 판매자 또는 사용자는 이점을 주의하시기
바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에
서 비업무용으로 교환하시기 바랍니다.

Index

A

assertion event, BMC log 73
assistance, getting 167
attention notices 2

B

battery
installing 48
removing 48
battery return program 172
battery, installing 48
battery, removing 48
beep code errors 66
bezel assembly
installing 33
removing 34
blade server
installing 28
removing 27
blade server cover
installing 30
removing 29
BladeCenter LS22 and LS42
specifications 2
BMC error codes 160
BMC error log
viewing from Setup Utility
program 73
BMC event log 73
BMC log
assertion event, deassertion event 73
default timestamp 73
navigating 73
size limitations 72
buttons
CD/diskette/USB 4
keyboard/video/mouse 4
media-tray select 4
power-control 5

C

caution statements 2
checkout procedure
about 88
performing 89
cKVM card
installing 51
removing 51
Class A electronic emission notice 173
combination-form-factor expansion card
installing 47
removing 42
components
MPE unit 7
system board 6, 7
concurrent-KVM card
installing 51
removing 51

configuration
minimum 165
PXE Boot Agent Utility program 11
Setup Utility program 11
with ServerGuide 15
configuring your blade server 11
connectors
I/O-expansion card 7
memory 7
microprocessor 7
MPE unit 7
SAS hard disk drives 7
system board 7
controller
enable or disable Ethernet 12
enable or disable SCSI 12
Ethernet 17
CPU error code 112

D

danger statements 2
deassertion event, BMC log 73
description
switches, MPE unit 9
switches, system board 8
diagnostic
error codes 111
programs, overview 108
programs, starting 109
text message format 110
tools, overview 65
display problems 93
drive
connectors 7
DSA
Dynamic System Analysis 108
Dynamic System Analysis
DSA 108

E

electronic emission Class A notice 173
error codes and messages
beep 66
diagnostic 111
POST/BIOS 78
SAS 160
error LEDs 104
error logs 72
BMC event 73
BMC system event log 72
Management-module event log 72
viewing 73
error symptoms
general 90
hard disk drive 90
intermittent 91
microprocessor 93
monitor 93

error symptoms (*continued*)

optional devices 95
ServerGuide 102
software 103
USB port 103
video 93
errors
BMC 160
format, diagnostic code 110
light path LEDs 106
messages, diagnostic 108
service processor 160
Ethernet controller
configuring 17
Ethernet device failed 140
expansion unit
installing 32
removing 31

F

FCC Class A notice 173
features
ServerGuide 15
filler
microprocessor heat sink 26
firmware updates 17
forgotten power-on password,
bypassing 14

G

getting help 167

H

hard disk drive
connectors 7
problems 90
specifications 3
hard disk drive tray
installing 55
removing 54
hardware service and support 168
help, getting 167
high-speed expansion card
installing 46
removing 41

I

I/O-expansion card
connectors 7
I/O-expansion cards
installing 43
removing 39
IBM Support Line 168
important notices 2

- installing
 - battery 48
 - bezel assembly 33
 - blade server 28
 - blade server cover 30
 - cKVM card 51
 - combination-form-factor expansion card 47
 - concurrent-KVM card 51
 - hard disk drive tray 55
 - high-speed expansion card 46
 - I/O-expansion cards 43
 - LS22 optimizer 50
 - memory module 38
 - microprocessor 59
 - MPE board assembly 62
 - SAS drive 36
 - small-form-factor expansion card 44
 - standard-form-factor expansion card 45
 - system-board assembly 62
 - USB flash drive 53
- integrated functions 3
- intermittent problems 91

L

- LEDs
 - activity 5
 - error, locations 104
 - information 5
 - light path diagnostics, viewing without power 104
 - light path, locations 104
 - location 5
 - MPE unit 10
 - power-on 5
 - system board, blade server 9
- light path diagnostics 103
- light path diagnostics LEDs 106
- light path diagnostics panel
 - blade server 9
 - MPE unit 10
- light path LED locations 104
- logs
 - BMC system event 72
 - Management module event 72
- LS22 optimizer
 - installing 50
 - removing 49
- LS22 optimizer, installing 50
- LS22 optimizer, removing 49
- LSI logic configuration utility program
 - description 11

M

- media-tray select button 4
- memory
 - specifications 3
- memory module
 - installing 38
 - removing 37
 - specifications 3
 - supported 3
- memory problems 92

- memory stress test 136
- messages
 - diagnostic 108
- microprocessor
 - heat sink 59
 - installing 59
 - problems 93
 - removing 57
 - specifications 3
- minimum configuration 165
- monitor problems 93
- MPE board assembly
 - installing 62
 - replacing 62
- MPE unit
 - LEDs 10
- MPE unit connectors 7
- MPE unit switches
 - description 9

N

- network connection problems 95
- no beep symptoms 71
- NOS installation
 - with ServerGuide 15
 - without ServerGuide 16
- notes 2
- notes, important 170
- notices 169
 - electronic emission 173
 - FCC, Class A 173
- notices and statements 2

O

- optical drive error 137
- optional device problems 95

P

- parts listing 19
- password
 - power-on 14
- POST
 - about 65
 - error log 73
- POST/BIOS error codes 78
- power problems 98
- power-on password 14
- Preboot Execution Environment (PXE)
 - option
 - disabling 13
 - enabling 13
- problem determination tips 166
- problems
 - general 90
 - hard disk drive 90
 - intermittent 91
 - memory 92
 - microprocessor 93
 - monitor 93
 - network connection 95
 - optional devices 95
 - POST/BIOS 78
 - power 98

- problems (*continued*)
 - ServerGuide 102
 - service processor 102
 - software 103
 - undetermined 164, 166
 - USB port 103
 - video 93
- product recycling and disposal 171
- publications 1
- PXE boot agent utility program 11
 - using 16

R

- recycling and disposal, product 171
- removing
 - battery 48
 - bezel assembly 34
 - blade server 27
 - blade server cover 29
 - cKVM card 51
 - combination-form-factor expansion card 42
 - concurrent-KVM card 51
 - hard disk drive tray 54
 - high-speed expansion card 41
 - I/O-expansion cards 39
 - LS22 optimizer 49
 - memory module 37
 - microprocessor 57
 - SAS drive 35
 - small-form-factor expansion card 40
 - standard-form-factor expansion card 40
 - USB flash drive 52
- replacing
 - MPE board assembly 62
 - system-board assembly 62

S

- SAS drive
 - installing 36
 - removing 35
- SAS error messages 160
- SAS RAID
 - configure an array 18
- ServerGuide
 - features 15
 - NOS installation 15
 - problems 102
 - using 14
- service processor error codes 160
- service processor problems 102
- setup
 - with ServerGuide 15
- Setup Utility program 11
- small-form-factor expansion card
 - installing 44
 - removing 40
- software problems 103
- software service and support 168
- specifications
 - BladeCenter LS22 and LS42 2
 - standard-form-factor expansion card
 - removing 40, 45

- start options 12
- starting the blade server 5
- statements and notices 2
- static electricity 26
- static-sensitive devices, handling 26
- stopping the blade server 6
- support, web site 167
- switches, system board 8
- system board
 - switches 8
- system board layouts 6
- system board switches
 - description 8
- system board, blade server
 - LEDs 9
- system reliability 26
- system-board assembly
 - installing 62
 - replacing 62
- system-board connectors 7

T

- telephone numbers 168
- tools, diagnostic 65
- trademarks 170
- troubleshooting tables 89
- turning off the blade server 6
- turning on the blade server 5

U

- undetermined problems 164
- United States electronic emission Class A
 - notice 173
- United States FCC Class A notice 173
- Universal Serial Bus (USB) problems 103
- updating firmware 17
- USB flash drive
 - installing 53
 - removing 52
- utility
 - PXE boot agent program, using 16
 - Setup Utility program 11

V

- video problems 93

W

- web site
 - publication ordering 167
 - support 167
 - support line, telephone numbers 168
- Web site
 - ServerGuide 14
 - supported blade server options 26



Part Number: 49Y0107

Printed in USA

(1P) P/N: 49Y0107

