Intel® Server Compute Blade SBXL52: Hardware Maintenance Manual and Troubleshooting Guide

A Guide for Technically Qualified Assemblers of Intel® Identified Subassemblies & Products

Order Number: C39684-003

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1 SBXL52 safety and regulatory information

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

Important Safety Instructions

Read all caution and safety statements in this document before performing any of the instructions. See *Intel Server Boards and Server Chassis Safety Information* on the Resource CD and/or at http:\\support.intel.com.

Wichtige Sicherheitshinweise

Lesen Sie zunächst sämtliche Warn- und Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen. Beachten Sie hierzu auch die Sicherheitshinweise zu Intel-Serverplatinen und -Servergehäusen auf der Ressourcen-CD oder unter http:\\support.intel.com.

重要安全指导

在执行任何指令之前，请阅读本文档中的所有注意事项及安全声明。参见 Resource CD（资源光盘） 和/或 http:\\support.intel.com 上的 *Intel Server Boards and Server Chassis Safety Information*（《Intel 服务器主板与服务器机箱安全信息》）。

Consignes de sécurité

Lisez attention toutes les consignes de sécurité et les mises en garde indiquées dans ce document avant de suivre toute instruction. Consultez *Intel Server Boards and Server Chassis Safety Information* sur le CD Resource CD ou bien rendez-vous sur le site http:\\support.intel.com.

Instrucciones de seguridad importantes

Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones. Vea *Intel Server Boards and Server Chassis Safety Information* en el CD Resource y/o en http:\\support.intel.com.

General Safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.

- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.

- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.

- Keep your tool case away from walk areas so that other people will not trip over it.

- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.

  Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.

- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

  Remember: Metal objects are good electrical conductors.

- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.

- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.

- Reinstall all covers correctly before returning the machine to the customer.

Electrical Safety

××CAUTION:

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the server system power cords, telecommunication systems, networks, and modems before you open the server covers.

⚊ Important: Observe the following rules when working on electrical equipment.

- Disconnect all power before performing a mechanical inspection.

- Before you start to work on the machine, unplug the power cord. or power-off the wall box that supplies power to the machine and to lock the wall box in the off position.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.

- Do not use worn or broken tools and testers.

- Never assume that power has been disconnected from a circuit. First, check that it has been powered-off.

- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.

- Do not touch live electrical circuits with the reflective surface of an inspection mirror. The surface is conductive; such touching can cause personal injury and machine damage.

Handling electrostatic discharge-sensitive devices

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

⊸ **NOTE**

> Use product-specific ESD procedures when they exceed the requirements noted here.
>
> Make sure that the ESD-protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

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

    ⊸ **NOTE**

    > The use of a grounding system is desirable but not required to protect against ESD damage.
    >
    > Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
    >
    > Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
    >
    > Use the round ground-prong of the AC plug on AC-operated computers.

××**CAUTION:**

> 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.

××**CAUTION:**

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

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.

- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

DANGER

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

×× **CAUTION:**

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

Regulatory specifications and disclaimers

Safety compliance

USA:	UL 60950 - 3rd Edition/CSA 22.2. No. 60950
Canada:	cUL certified - 3rd Edition/CSA 22.2. No. 60950- for Canada (product bears the single cUL mark for U.S. and Canada)
Europe:	Low Voltage Directive, 73/23/EEC UL/CB to EN60950 3rd Edition
International:	UL/CB to IEC 60950 3rd Edition UL/CB - EN60 950 3rd Edition UL/CB - EMKO-TSE (74-SEC) 207/94
Australia/New Zealand:	CB Report to IEC 60950, 3rd Edition plus international deviations

Electromagnetic compatibility (EMC)

USA:	FCC CFR 47 Part 2 and 15, Verified Class A Limit
Canada:	IC ICES-003 Class A Limit
Europe:	EMC Directive, 89/336/EEC
	EN55022, Class A Limit, Radiated & Conducted Emissions
	EN55024 ITE Specific Immunity Standard
	EN61000-4-2 ESD Immunity (Level 2 Contact Discharge, Level 3 Air Discharge)
	EN61000-4-3 Radiated Immunity (Level 2)
	EN61000-4-4 Electrical Fast Transient (Level 2)
	EN61000-4-5 AC Surge
	EN61000-4-6 Conducted RF
	EN61000-4-8 Power Frequency Magnetic Fields
	EN61000-4-11 Voltage Dips and Interrupts
Japan:	VCCI Class A ITE (CISPR 22, Class A Limit)
Australia/New Zealand:	AS/NZS 3548, Class A Limit
Taiwan:	BSMI Approval
Korea:	RRL Approval
Russia:	GOST Approved
International:	CISPR 22, Class A Limit

Electromagnetic compatibility notices (International)

Europe (CE Declaration of Conformity): This product has been tested in accordance too, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

Japan EMC Compatibility:

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

English translation of the notice above: This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

ICES-003 (Canada): Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadian des Communications.

English translation of the notice above: This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Canadian Department of Communications.

BSMI (Taiwan): The BSMI Certification number and the following warning is located on the product safety label which is located visibly on the external chassis.

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。

RRL Korea:

기 종 별	사 용 자 안 내 문
A급 기기	이 기기는 업무용으로 전자파 적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.
B급 기기	이 기기는 가정용으로 전자파 적합등록을 한 기기로서 주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

※ 비고
A급 기기 : 업무용 정보통신기기를 말한다.
B급 기기 : 가정용 정보통신기기를 말한다.

English translation of the notice above:

Device	User's Information
Class A device	This device complies with RRL EMC and is operated in commercial environment so that distributors or users pay attention to this point. If the product is sold or purchased improperly, please exchange this product to what can be used at home.
Class B device	This device complies with RRL EMC and is operated in a residential area so that it can be used at all other location as well as residential area.
note: Class A device: operated in a commercial area. Class B device: operated in a residential area.	

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2 Introduction

Your server is a blade-model server that is one of up to 14 blades that can be installed in the SBCE unit, This high-performance blade server is ideally suited for networking environments that require superior microprocessor performance, efficient memory management, flexibility, and reliable data storage.

This *Hardware Maintenance Manual and Troubleshooting Guide* and other publications that provide detailed information about your blade server are provided in Portable Document Format (PDF) on the *Resource* CD.
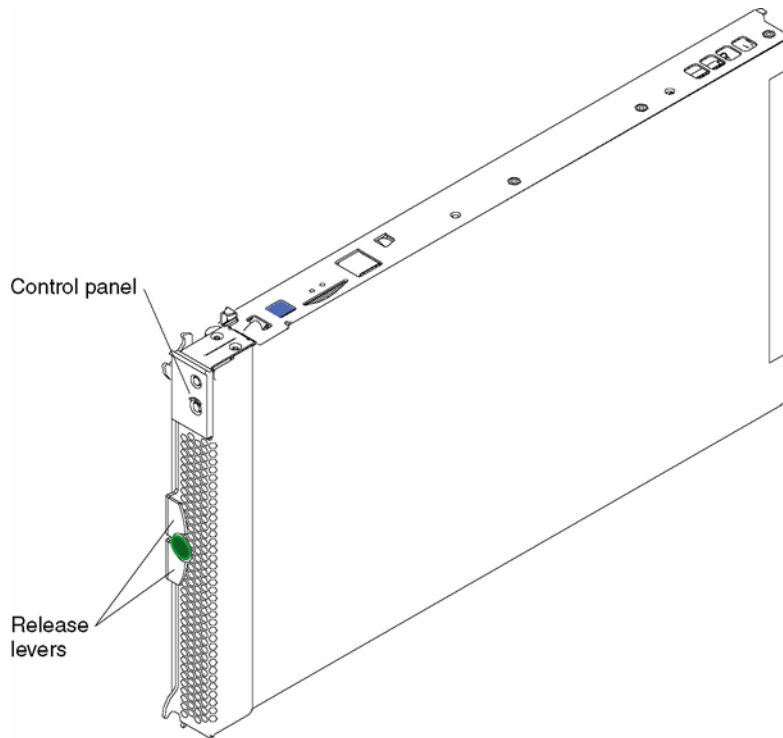
A set of user labels comes with the blade server. When you install the blade server in the SBCE unit, write whatever identifying information you want on a label and place it on the SBCE bezel just below the blade server, as shown in the following illustration.

User label
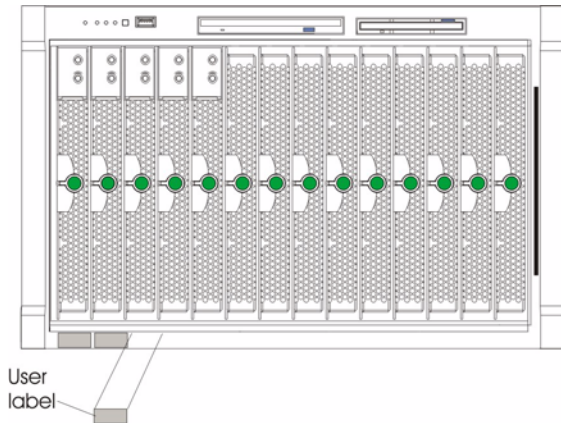
TP00216

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

Related publications

In addition to this *Hardware Maintenance Manual and Troubleshooting Guide*, the following documentation is provided in PDF on the Resource CD that comes with your SBCE unit:

- *Intel Server Boards and Server Chassis Safety Information*: This publication contains translated Safety information. To reduce the risk of bodily injury, electrical shock, fire and equipment damage, read this document and observe all warnings and precautions in this guide before installing or maintaining your Intel server product.

- *Intel Server Compute Blade SBXL52 Installation and User's Guide:* This publication provides general information about the blade server, including information about features, how to configure the server, and how to get help.

Additional publications might be included on the *Resource* CD.

Important shipping notices

Do not ship the SBXL52 server in the SBCE chassis. It must be shipped separately, in the original packaging to avoid damage.

Features and specifications

The following table provides a summary of the features and specifications of your SBXL52 blade server.

You can use the Configuration/Setup Utility program in your server to determine the specific type of microprocessor that is in the blade server.

▬ NOTE

Power, cooling, removable-media drives, external ports, and advanced system management are provided by the Intel Server Chassis SBCE.

Microprocessor:

Supports up to 2 microprocessors

- Intel® Xeon™ Processor
- 512 KB ECC L2 cache
- 533 MHz front-side bus (FSB)

Memory:

- Four double data rate (DDR) PC1600 sockets
- Minimum: 512 MB
- Maximum: 4 GB
- Type: 2-way interleaved, DDR, PC2100, ECC SDRAM registered x4 (Chipkill) DIMMs only

  ═ NOTE
  > PC2100 DIMMs are backward-compatible and can function in the PC1600 sockets

- Supports 256 MB, 512 MB, and 1 GB dual inline memory modules (DIMMs)

Drives:

- Support for up to two internal IDE 2.5-inch hard disk drives
- Support for up to two Ultra320 SCSI hot-swap hard disk drives available in an optional SCSI storage expansion unit

Size:

- Height: 24.5 cm (9.7 inches)
- Depth: 44.6 cm (17.6 inches)
- Width: 2.9 cm (1.14 inches)
- Maximum weight: 5.4 kg (12 lb)

Integrated functions:

- Two Gigabit Ethernet controllers
- ATI* Rage* XL video controller
- Light path diagnostics
- Local service processor
- IDE hard disk drive controller
- RS-485 interface for communication with SBCE management module
- USB buses for communication with keyboard, mouse, diskette drive, and CD-ROM drive

Predictive Failure Analysis (PFA) alerts:

- Microprocessor
- Memory
- Hard disk drives

Environment:

- Air temperature:
  — Blade server on: 10° to 35°C (50° to 95°F). Altitude: 0 to 914 m (2998.69 ft)
  — Blade server on: 10° to 32°C (50° to 95°F). Altitude: 914 m to 2134 m (2998.69 ft to 7000 ft)
  — Blade server off: -40° to 60°C (-40° to 140° F)
- Humidity:
  — Blade server on: 8% to 80%
  — Blade server off: 5% to 80%

Electrical input:

- Input voltage: 12 V dc

═ NOTE
> The operating system in the blade server must provide USB support for the blade server to recognize and use the keyboard, mouse, CD-ROM drive, and diskette drive. The SBCE unit uses USB for internal communications with these devices.

Notices and statements used in this book

The following notices and statements are used in the documentation:

- **Note:** These notices provide important tips, guidance, or advice.

- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.

- **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.

- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.

- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

3 Blade server power, controls, and indicators

The following information describes the power features, how to turn on and turn off the blade server, and what the controls and indicators mean.

Turning on the blade server

After you connect the SBCE unit to ac power, 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) to start the server, if local power is enabled.

  Notes:
  1. After you plug the power cords of your SBCE unit into the power distribution unit (PDU), wait until the power-on LED on the blade server flashes slowly before pressing the blade server power-control button. This should take about 20 seconds. During this time, the service processor in the SBCE management module is initializing; therefore, the power-control button on the blade server does not respond.
  2. While the server is powering up, the power-on LED on the front of the server is lit.

- If a power failure occurs, the SBCE unit and then the blade server can start automatically when power is restored (if the blade server is configured through the SBCE management module to do so).

- You can turn on the blade server remotely by means of the service processor in the SBCE management module.

  ☞ Important

  Blade server startups initiated from the network will be faster if you connect the DHCP server to the Ethernet switch in switch bay 2. This is because the BIOS code in the blade server "sees" the bottom Ethernet controller first, and the bottom Ethernet controller in each blade server is associated with the switch in switch bay 2.

- If your operating system supports the Wake on LAN feature and the blade server power-on LED is flashing slowly, the Wake on LAN feature can turn on the blade server (if the SBCE management module has not disabled the Wake on LAN feature).

  ☞ NOTE

  The Wake on LAN (WOL) feature is enabled permanently in the blade server BIOS code. The WOL enabled/disabled setting for each blade server slot is stored in the management module NVRAM. The default setting for each blade server slot is Enabled. To disable WOL for one or more blade servers, use the management module Web interface.

Turning off the blade server

When you turn off the blade server, it is still powered through the SBCE 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 SBCE unit.

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

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) if local power is enabled. This starts an orderly shutdown of the operating system, if this feature is supported by your operating system.

  ⇒ **NOTE**
  > After turning off the blade server, wait at least 5 seconds before you press the power-control button to turn on the blade server again.

- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the blade server.

- The management module can turn off the blade server through the service processor.

⇒ **NOTE**
> After turning off the blade server, wait at least 30 seconds for it to stop running (the power light will start blinking) before you remove the blade server from the SBCE unit.

Improper shutdown of a blade server will not allow that blade server to be restarted using Wake on LAN. To reset the blade server power state and re-enable its previously programmed Wake on LAN capability:
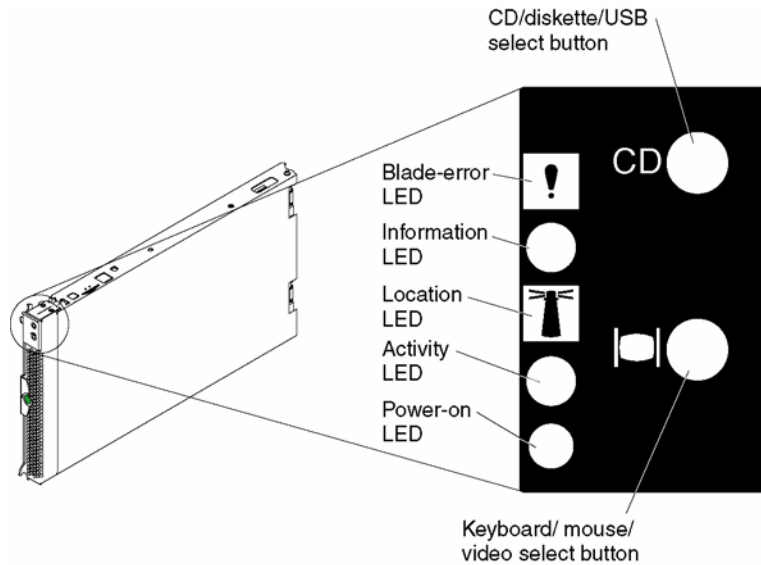
1. Turn off the blade server.
2. Unlatch and slide the blade server partially out of the SBCE unit.
3. Reinstall the blade server.

Blade server controls and LEDs

This section describes the controls and light-emitting diodes (LEDs) on your blade server.

⇒ **NOTE**
> The control panel is shown in the closed (normal) position in this illustration.

CD/diskette/USB
select button

Blade-error
LED

Information
LED

Location
LED

Activity
LED

Power-on
LED

Keyboard/ mouse/
video select button

TP00266

CD/diskette/USB select button: Press this button to associate the CD-ROM drive, diskette drive, and USB port with this blade server.

⊸ NOTE

> The CD-ROM drive, diskette drive, keyboard and mouse in the SBCE unit are viewed as USB devices by the blade server operating system.

The LED on this button flashes while the request is being processed, then is steady when the ownership of the CD-ROM drive, diskette drive, and USB port has been transferred to this blade server. If the button does not respond, verify that switching support is enabled in the SBCE unit.

⊸ NOTE

> It can take approximately 20 seconds for the operating system in the switched-to blade server to recognize the CD-ROM drive, diskette drive, and USB port, or the keyboard, video, and mouse.

1. The system-error LED might light, and a KVM allocation error might be logged, if the change in ownership for the CD-ROM drive, diskette drive, and USB port, or the keyboard, video, and mouse takes more than 8 seconds. The system-error LED will go off after the ownership change is complete.

2. It can take up to 48 seconds after a blade server is initially turned on before you can attempt to switch KVM control to that blade server.

Blade-error LED: When this amber LED is lit, it indicates that a system error has occurred in the blade server.

Information LED: When this amber LED is lit, it indicates that information about a system error for this blade server has been placed in the SBCE system error log.

Location LED: When this blue LED is lit, it has been turned on remotely by the system administrator to aid in visually locating the blade server. The location LED on the SBCE unit will be on also.

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

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

- Flashing rapidly – The service processor on the blade server is handshaking with the SBCE management module.
- Flashing slowly – The blade server has power but is not turned on.
- Steady – The blade server has power and is turned on.

Keyboard/mouse/video select button: Press this button to associate the keyboard port, mouse port, and video port with this blade server. The LED on this button flashes while the request is being processed, then is steady when the ownership of the keyboard, mouse, and video has been transferred to this blade server. If the button does not respond, verify that switching support is enabled in the SBCE unit.

Notes:

1. The operating system in a blade server must provide USB support for that blade server to recognize and use the keyboard, mouse, CD-ROM drive, and diskette drive. The SBCE unit uses USB for internal communication with these devices.

2. It can take approximately 20 seconds to switch the keyboard, video, and mouse or the CD-ROM drive, diskette drive, and USB port to the blade server.

    a. The system-error LED might light, and a KVM allocation error might be logged, if the change in ownership for the CD-ROM drive, diskette drive, and USB port, or the keyboard, video, and mouse takes more than 8 seconds. The system-error LED will go off after the ownership change is complete.

    b. It can take up to 48 seconds after a blade server is initially turned on before you can attempt to switch KVM control to that blade server.

3. If a blade server is under heavy load, it can take several minutes before it enumerates the USB devices connected to it. If control of the KVM and media tray is switched away from the blade server before this enumeration is complete, a USB device installation error might be received. Do not switch KVM control between blade servers until the mouse and keyboard are both working on the blade server that has control of the KVM and media tray.

4. If you install Microsoft Windows 2000 on the blade server while it is not the current owner of the keyboard, video, and mouse, a delay of up to one minute occurs the first time you switch the keyboard, video, and mouse to the blade server. During this one-time-only delay, the blade server Device Manager enumerates the keyboard, video, and mouse and loads the device drivers. All subsequent switching takes place in the normal keyboard-video-mouse switching time frame.

5. The location LED can be turned off through the SBCE management-module Web interface.

Power control button
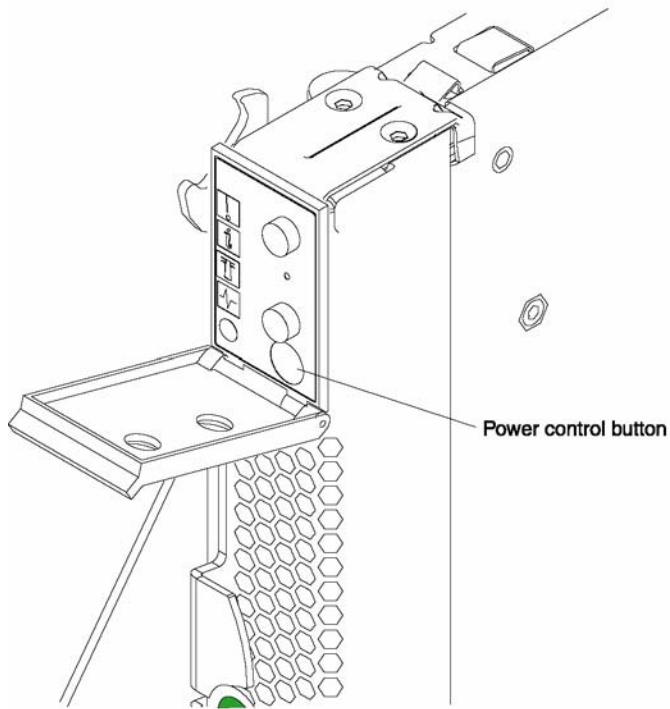
TP00261

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

> **NOTE**
>
> This button has effect only if local power control is enabled for the blade server. Local power control is enabled and disabled through the SBCE management module Web interface.

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4 Configuration

The following configuration programs are provided with your blade server:

- **Configuration/Setup Utility program**

  This is part of the basic input/output system (BIOS) code in your blade server. Use it to change interrupt request (IRQ) settings, set the date and time, and set passwords. See "Using the Configuration/Setup Utility program" for more information.

- **PXE boot agent utility program**

  The Preboot eXecution Environment (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, to display the PXE setup prompt or to disable it, to set the prompt display duration, and to select a power management option. For information about using this utility, see "Using the PXE boot agent utility program" on page 14.

Using the Configuration/Setup Utility program

This section provides the instructions to start the Configuration/Setup Utility program and descriptions of the menu choices.

Starting the Configuration/Setup Utility program

Complete the following steps to start the Configuration/Setup Utility program:

1. Turn on the blade server and watch the monitor screen.
2. When the message `Press F1 for Configuration/Setup` appears, press F1.
3. Follow the instructions that appear on the screen.

Configuration/Setup Utility menu choices

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

- **System Summary**

  Select this choice to display configuration information, including the type, speed, and cache sizes of the microprocessors and the amount of installed memory. When you make configuration changes through other options in the Configuration/Setup Utility program, the changes are reflected in the system summary; you cannot change settings directly in the system summary.

  This choice is on the full and limited Configuration/Setup Utility menus.

- **System Information**

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

  This choice is on the full Configuration/Setup Utility main menu.

— **Product Data**

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

• **Devices and I/O Ports**

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

Select this choice to enable or disable the integrated IDE and Ethernet controllers.

— The default setting is **Enable** for the IDE and Ethernet controllers. If you select **Disable**, the system will not configure the disabled device, and the operating system will not detect the device. (This is equivalent to disconnecting the device.)

• **Date and Time**

Select this choice to set the system date and time, in 24-hour format (*hour:minute:second*). This choice is on the full Configuration/Setup Utility main menu only.

You can set a time to be added or subtracted from the system time that is sent to the service processor each time the blade server is started. Use the number keys to type the hours and minutes and + or − to add or subtract from the system time. If you want the system clock time to be the same as the service processor clock time, leave the value set at its default of 0.

• **System Security**

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

• **Start Options**

Select this choice to view or change the start options. This choice appears only on the full Configuration/Setup Utility main menu. Start options take effect when you start your blade server.

> **NOTE**
> To set the startup sequence, which is the order in which the blade server checks devices to find a boot record, you must use the SBCE management-module Web interface.

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 Preboot eXecution Environment (PXE) option for either of the integrated Gigabit Ethernet controllers. The default setting for this menu item is **Enabled**, which enables the PXE option for the selected controller. To disable this option for a Gigabit Ethernet controller, select **Disabled**.

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

— **System Partition Visibility**

Select this choice to specify whether the System Partition is to be visible or hidden.

— **Memory Settings**

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

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

— **CPU Options**

Select this choice to enable or disable the microprocessor cache. In addition, you can set the microprocessor cache mode to write-back (WB) or write-through (WT). Write-back caching generally provides better system performance.

— **PCI Bus Control**

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

— **Integrated System Management Processor 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 non-maskable interrupt (NMI) to the blade server.

• **Error Logs**

Select this choice to view or clear the POST error log.

— Select **POST Error Log** to view the three most recent error codes and messages that the system generated during POST.

From the **POST Error Log** menu, select **Clear event/error logs** to clear the Error log.

• **Save Settings**

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

• **Restore Settings**

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

• **Load Default Settings**

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

• **Exit Setup**

Select this choice to exit from the Configuration/Setup Utility program. If you have not saved the changes 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.

Power-on password

If you set a power-on password, you must type the power-on password to complete the system startup, and you have access to the full Configuration/Setup Utility menu.

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

If you forget the power-on password, you can regain access to the blade server through one of the following methods:

- Remove the blade server battery, wait 15 minutes, then reinstall the battery.

- Change the position of the power-on password override switch (switch 8 on switch block 2 on the system board) to bypass the power-on password check the next time the blade server is turned on. You can then start the Configuration/Setup Utility program and change the power-on password. You do not need to move the switch back to the previous position after the password is overridden. See "Switches and jumpers" on page 31 for the location of switch block 2.

  ⇒ **NOTE**

  Shut down the operating system, turn off the blade server, and remove the blade server from the SBCE unit to access the switches.

Using the PXE boot agent utility program

This program is a built-in, menu-driven configuration utility program that you can use to:

- Select the boot protocol and other boot options
- Select whether to display the PXE setup prompt and the display duration
- Select a power management option

⇒ **NOTE**

The RPL selection for the boot protocol option is not supported for this server.

Starting the PXE boot agent utility program

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

1. Turn on the server.
2. When the `Broadcom NetXtreme Boot Agent vX.X.X` prompt appears, press Ctrl+S.
   Notes:
   a. If the PXE setup prompt is not displayed, use the Configuration/Setup Utility program to set the enable Ethernet PXE/DHCP option.
   b. By default, you have 2 seconds after the prompt appears on the screen to press Ctrl+S.
3. Use the arrow keys or press Enter to select a choice from the menu.

   - Press Esc to return to the previous menu.
   - Press the F4 key to exit.

4. Follow the instructions on the screen to change the settings of the selected items; then, press Enter.

Firmware updates

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

⇒ **Important**

⇒ To avoid problems and to maintain proper system performance, always ensure that the blade server BIOS, service processor, and diagnostic firmware levels are consistent for all blade servers within the SBCE unit.

Firmware	Update diskette	Management module Web interface	Switch module Web interface	Switch module Telnet interface
Blade server BIOS code	Yes	No	No	No
Blade server diagnostic code	Yes	No	No	No
Blade server service processor code	Yes	Yes	No	No

Updating the service processor firmware

The service processor in your blade server provides the following features:

- Continuous health monitoring and control
- Configurable notification and alerts
- Event logs that are timestamped, saved in nonvolatile memory, and can be attached to e-mail alerts
- Remote graphics console redirection
- Point-to-point protocol (PPP) support
- Remote power control
- Remote firmware update and access to critical server settings
- Around-the-clock access to the blade server, even if the server is turned off

At some time, you might need to flash the service processor to apply the latest firmware. Obtain the latest firmware for your blade server service processor from your Intel Support Representative. Use the management-module Web interface to flash the service processor. The Web interface is described in the Intel Server System SBCE Installation and User's Guide on the *Resource* CD.

Configuring the Gigabit Ethernet controllers

Two Ethernet controllers are integrated on the blade server system board. Each controller provides a 1000-Mbps full-duplex interface for connecting to one of the Ethernet-compatible switch modules in I/O module bays 1 and 2, which enables simultaneous transmission and reception of data on the Ethernet local area network (LAN). Each Ethernet controller on the system board is routed to a different switch module in I/O module bay 1 or bay 2. The routing from Ethernet controller to I/O module bay will vary based on blade server type and the operating system that is installed. See "Blade server Ethernet controller enumeration" on page 17 for information about how to determine the routing from Ethernet controller to I/O module bay for your blade server.

> **─ NOTE**
>
> Other types of blade servers, that are installed in the same SBCE unit as this SBXL52 blade server might have different Ethernet controller routing. See the documentation that comes with the other blade servers for detailed information.

You do not need to set any jumpers or configure the controllers for the blade server operating system. However, you must install a device driver to enable the blade server operating system to address the Ethernet controllers. For device drivers and information about configuring your Ethernet controllers, see the *Broadcom NetXtreme Gigabit Ethernet Software* CD that comes with your blade server. For updated information about configuring the controllers, contact your Intel Support Representative.

Your Ethernet controllers support failover, which provides automatic redundancy for your Ethernet controllers. You can configure either one of the integrated Ethernet controllers as the primary Ethernet controller. If you have configured the controllers for failover and the primary link fails, the secondary controller takes over. When the primary link is restored, the Ethernet traffic switches back to the primary Ethernet controller. (See your operating system device driver documentation for information about configuring for failover.)

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

Blade server Ethernet controller enumeration

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

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

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

Two Ethernet switch modules are required to use both dual Ethernet channels of the blade server.

One Ethernet switch module is installed in the SBCE unit and is fully functional with blade server integrated Ethernet channel ETH0. If the second blade server integrated Ethernet channel ETH1 is configured, it is unable to communicate with network resources.

Within the SBCE unit, Ethernet switch modules are physically wired independently to the integrated Ethernet controller channels of each blade server: the ETH0 Ethernet controller channel on the blade server is wired to the top Ethernet switch module and the ETH1 Ethernet controller channel on the blade server is wired to the bottom Ethernet switch module. Two Ethernet switch modules are required to use both blade server Ethernet channels.

See the *SBCE Installation and User's Guide* for more information.

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5 Diagnostics

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

If you cannot locate and correct the problem using the information in this section, see Appendix A, "Getting help and technical assistance," on page 93 for more information.

General checkout

The server diagnostic programs are stored in the upgradeable read-only memory (ROM). These programs test the major components of your blade server.

If you cannot determine whether a problem is caused by the hardware or by the software, you can run the diagnostic programs to confirm that the hardware is working properly.

When you run the diagnostic programs, a single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After the cause of the first error message is corrected, the other error messages might not occur the next time you run the test.

Notes:

1. If multiple error codes are displayed, diagnose the first error code that is displayed.
2. If the server stops with a POST error, go to "POST error codes" on page 76.
3. If the blade server stops and no error is displayed, go to "Undetermined problems" on page 100.
4. For safety information, see "Electrical Safety" on page vi.
5. For intermittent problems, check the error log.
6. If blade front panel shows no LEDs, verify blade status and errors in SBCE web interface; also see "Undetermined problems" on page 100.
7. If device errors occur, see "Error symptoms" on page 83.

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USE THE FOLLOWING PROCEDURE TO CHECKOUT THE SERVER.

1. Turn off the server and all external devices, if attached.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Turn on all external devices.
5. Turn on the server.
6. Record any POST error messages that are displayed on the screen. If an error is displayed, look up the first error in the "POST error codes" on page 76.
7. Check the information LED panel Blade Error LED; if it is on, see "Identifying problems using the light path diagnostics" on page 24.
8. Check the System Error log. If an error was recorded by the system, see Chapter 9, "Symptom-to-FRU index," on page 69.
9. Start the diagnostic programs.
10. Check for the following responses:

    - One beep.

    - Readable instructions or the main menu.

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DID YOU RECEIVE BOTH OF THE CORRECT RESPONSES?

NO. Find the failure symptom in Chapter 9, "Symptom-to-FRU index," on page 69.

YES. Run the diagnostic programs. If necessary, see "Diagnostic programs and error messages" on page 21.

If you receive an error, see Chapter 9, "Symptom-to-FRU index," on page 69.

If the diagnostic programs were completed successfully and you still suspect a problem, see "Undetermined problems" on page 100.

Diagnostic tools overview

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

- **POST beep codes**

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

  — One beep indicates successful completion of POST.
  — More than one beep indicates that POST detected a problem. Error messages also appear during startup if POST detects a hardware-configuration problem.

  See "Beep symptoms" on page 69 for more information.

- **Error symptom charts**

  These charts list problem symptoms and steps to correct the problems. See "Error symptoms" on page 83 for more information.

  The built-in system diagnostic programs are upgradeable read-only memory (ROM). These programs test the major components of your blade server

- **Light path diagnostics feature**

Use the light path diagnostics feature to identify system errors quickly. See the "Light path diagnostics* feature overview" on page 24 for more information.

POST error logs

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

If POST finishes without detecting any problems, a single beep sounds, and the first screen of your operating system or application program appears.

If POST detects a problem, more than one beep sounds, and an error message appears on your screen. See "Beep symptoms" on page 69 and "POST error codes" on page 76 for more information.

Notes:

1. If you have a power-on password set, you must type the password and press Enter, when prompted, before POST will continue.

2. A single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After you correct the cause of the first error message, the other error messages usually will not occur the next time you run the test.

The POST error log contains the three most recent error codes and messages that the system generated during POST. The System Error log refers you to the management module log, which can be accessed through the SBCE unit.

Viewing error logs from the Configuration/Setup Utility program

Start the Configuration/Setup Utility program; then, select **Error Logs** from the main menu. See "Using the Configuration/Setup Utility program" on page 11 for more information.

Diagnostic programs and error messages

The server diagnostic programs are stored in ROM on the system board. These programs are the primary method of testing the major components of your server.

Diagnostic error messages indicate that a problem exists; they are not intended to be used to identify a failing part. Troubleshooting and servicing of complex problems that are indicated by error messages should be performed by trained service personnel.

Sometimes the first error to occur causes additional errors. In this case, the blade server displays more than one error message. Always follow the suggested action instructions for the *first* error message that appears.

The following sections contain the error codes that might appear in the detailed test log and summary log when the diagnostic programs are run.

The error code format is as follows:

```
fff-ttt-iii-date-cc-text message
```

where:

fff is the three-digit function code that indicates the function being tested when the error occurred. For example, function code 089 is for the microprocessor.

ttt	is the three-digit failure code that indicates the exact test failure that was encountered. (These codes are for trained service personnel; see "Diagnostic error codes" on page 73)
iii	is the three-digit device ID. (These codes are for trained service personnel; see "Diagnostic error codes" on page 73)
date	is the date that the diagnostic test was run and the error recorded.
cc	is the check value that is used to verify the validity of the information.
text message	is the diagnostic message that indicates the reason for the problem.

Text messages

The diagnostic text message format is as follows:

```
Function Name: Result (test specific string)
```

where:

Function Name

is the name of the function being tested when the error occurred. This corresponds to the function code (fff) shown in the error code format in the previous section.

Result

can be one of the following:

Passed	This result occurs when the diagnostic test is completed without any errors.
Failed	This result occurs when the diagnostic test discovers an error.
User Aborted	This result occurs when you stop the diagnostic test before it is complete.
Not Applicable	This result occurs when you specify a diagnostic test for a device that is not present.
Aborted	This result occurs when the test could not proceed, for example, because of the system configuration.
Warning	This result occurs when a possible problem is reported during the diagnostic test, such as when a device driver is not found.

test specific string

is additional information that you can use to analyze the problem.

Starting the diagnostic programs

You can press F1 while running the diagnostic programs to obtain help information. You also can press F1 from within a help screen to obtain online documentation from which you can select different categories. To exit from the help information and return to where you left off, press Esc.

Complete the following steps to start the diagnostic programs:

1. Turn on the blade server and watch the screen.

    ━ **NOTE**

    When running the diagnostic programs, make sure that the blade server controls the needed components for the tests, including the CD-ROM drive, diskette drive, and USB port. You can use the selection buttons on the blade server to make necessary adjustments.

2. When the message `F2 for Diagnostics` appears, press F2.
3. Type the appropriate password; then, press Enter.
4. After the diagnostic programs start, select either **Extended** or **Basic** from the top of the screen.
5. When the Diagnostic Programs screen appears, select the test you want to run from the list that appears; then, follow the instructions on the screen.

   Notes:

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

   b. The keyboard and mouse (pointing device) tests assume that a keyboard and mouse are attached to the SBCE and that the blade server controls them.

   c. If you run the diagnostic programs with either no mouse or a mouse attached to the SBCE unit that is not controlled by the blade server, you will not be able to navigate between test categories using the **Next Cat** and **Prev Cat** buttons. All other functions provided by mouse-selectable buttons are also available using the function keys.

   d. You can view server configuration information (such as system configuration, memory contents, and device drivers) by selecting **Hardware Info** from the top of the screen.

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

Viewing the test log

When the tests are completed, you can view the test log by selecting **Utility** from the top of the screen and then selecting **View Test Log**.

Notes:

1. You can view the test log only while you are in the diagnostic programs. When you exit the diagnostic programs, the test log is cleared (saved test logs are not affected). To save the test log so that you can view it later, click **Save Log** on the diagnostic programs screen and specify a location and name for the saved log file.

2. To save the test log to a diskette, you must use a diskette that you have formatted yourself; this function does not work with preformatted diskettes. If the diskette has sufficient space for the test log, the diskette may contain other data.

Diagnostic error message tables

For descriptions of the error messages that might appear when you run the diagnostic programs, see "Diagnostic error codes" on page 73

Notes:

1. Depending on your server configuration, some of these error messages might not appear when you run the diagnostic programs.

2. If diagnostic error messages appear that are not listed in the error message tables, make sure that your server has the latest levels of BIOS, service processor, and diagnostics microcode installed.

Error symptoms

This section describes methods for troubleshooting other error symptoms.

Error symptom charts

You can use the error symptom charts to find solutions to problems that have definite symptoms (see "Error symptoms" on page 83).

If you cannot find the problem in the error symptom charts, go to "Starting the diagnostic programs" on page 22 to test the blade server.

Small computer system interface messages

This information only applies if a storage expansion unit is available. If your receive a SCSI error message when running the SCSI Select Utility program, see "SCSI error codes" on page 95.
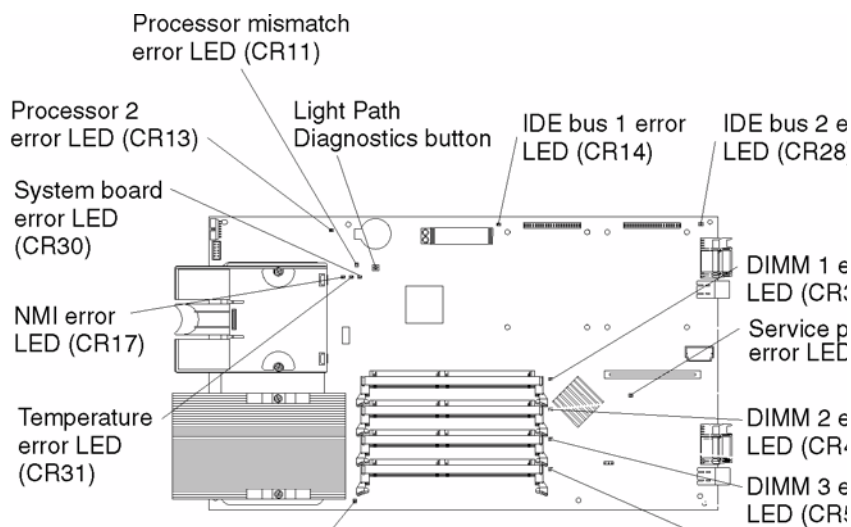
> ⚊ **NOTE**
> If your server does not have a hard disk drive, ignore any message that indicates that the BIOS is not installed.

Light path diagnostics* feature overview

If the system-error LED on the system LED panel on the front or rear of the SBCE unit is lit, one or more error LEDs on the SBCE unit components also might be on. These LEDs help identify the cause of the problem.

Identifying problems using the light path diagnostics

This section provides the information to identify, using the light path diagnostics, problems that might arise during installation. To locate the actual component that caused the error, you must locate the lit error LED on that component.

For example:

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

1. Remove the blade server from the SBCE unit.
2. Place the blade server on a flat, non-conductive surface.
3. Remove the cover from the blade server.
4. Press and hold the light path diagnostics button to relight the LEDs that were lit before you removed the blade server from the SBCE unit. The LEDs will remain lit for as long as you press the button, to a maximum of 25 seconds.

   ☞ **NOTE**
   > Power is available to relight the light path diagnostics LEDs for a short period of time after the blade server is removed from the SBCE unit. During that period of time, you can relight the light path diagnostics LEDs for a maximum of 25 seconds (or less, depending on the number of LEDs that are lit and the length of time the blade server is removed from the SBCE unit) by pressing the light path diagnostics button. The light path diagnostics power present LED (CR111) lights when the light path diagnostics button is pressed if power is available to relight the blade-error LEDs. If the light path diagnostics power present LED does not light when the light path diagnostics button is pressed, no power is available to light the blade-error LEDs and they will be unable to provide any diagnostic information.

Use the table at "Light path diagnostics" on page 81 to help determine the cause of the error and the action you should take.

Memory errors

If a memory problem occurs, take the following actions before replacing a DIMM:

1. Reseat both DIMMs in the bank.
2. Check for a memory type mismatch in the bank.
3. Run the diagnostic programs.

For more information about memory, see "Installing memory modules" on page 37

Recovering the BIOS code

If your BIOS code has become damaged, such as from a power failure during a flash update, the blade server may appear to be nonfunctional (no video, no beeps). You can recover your BIOS code using the BIOS code page jumper (J12) and a BIOS flash diskette.

☞ **NOTE**
> To obtain a BIOS flash diskette, contact your Intel Support Representative.

The flash memory of your server consists of a primary page and a backup page. The J12 jumper controls which page is used to start the blade server. If the BIOS code in the primary page is damaged, you can use the backup page to start the blade server; then, start the BIOS flash diskette to restore the BIOS code to the primary page.

To recover the BIOS code, complete the following steps:

1. Turn off the blade server.

2. Remove the blade server from the SBCE unit (see "Removing the blade server from the SBCE unit" on page 33).

3. Remove the cover (see "Opening the blade server cover" on page 33).

4. Locate jumper J12 (BIOS code page jumper) on the system board.

BIOS code page
jumper (J12)
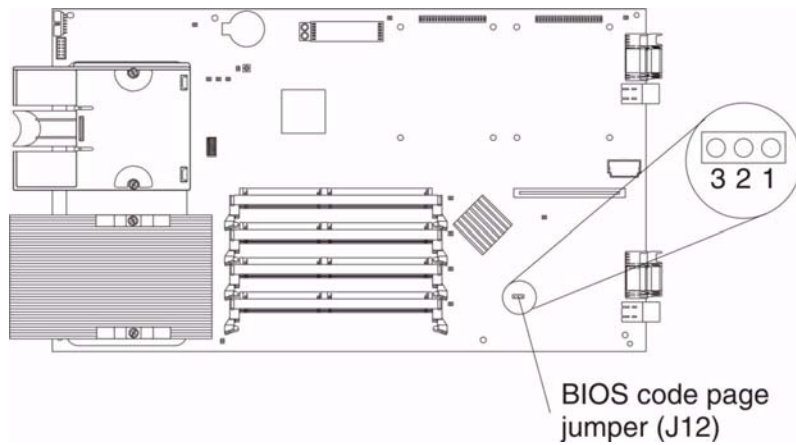
5. Move J12 to pins 2 and 3 to enable BIOS recovery mode.

6. Replace the cover and reinstall the blade server in the SBCE unit, making sure the media tray is selected by the relevant blade server.

7. Insert the BIOS flash diskette into the diskette drive.

8. Restart the blade server. The system begins the power-on self-test (POST).

9. Select **1 - Update POST/BIOS** from the menu that contains various flash (update) options.

10. When you are prompted whether you want to move the current POST/BIOS image to the backup ROM location, press N.

    Attention: If you press Y, the damaged BIOS will be copied into the secondary page.

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

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

13. **Attention:** Do not restart the blade server at this time. Remove the flash diskette from the diskette drive.

14. Turn off the blade server, remove it from the SBCE, and remove the cover of the blade server.

15. Move J12 to pins 1 and 2 to return to normal startup mode.

16. Replace the cover and reinstall the blade server in the SBCE unit; then restart the blade server. The system starts up.

⚠️ ⚡

××**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.

6 Installing options

This chapter provides instructions for adding options to your blade server. Some option-removal instructions are provided in case you need to remove one option to install another.

Installation guidelines

Before you begin to install options in your blade server, read the Intel® Server Boards and Server Chassis Safety Information included on the Resource CD.

- Read 1 "SBXL52 safety and regulatory information" on page v and the guidelines in "Handling static-sensitive devices." This information will help you work safely with your blade server and options.

- Back up all important data before you make changes to disk drives.

- Before you remove a hot-swap blade server from the SBCE unit, you must shut down the operating system and turn off the blade server. You do not have to shut down the SBCE unit itself.

System reliability considerations

To help ensure proper cooling and system reliability, make sure that microprocessor socket 2 always contains either the microprocessor heat sink filler or a microprocessor and heat sink.

Handling static-sensitive devices

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

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

- Limit your movement. Movement can cause static electricity to build up around you.

- Handle the device carefully, holding it by its edges or its frame.

- Do not touch solder joints, pins, or exposed printed circuitry.

- Do not leave the device where others can handle and possibly damage the device.

- While the device is still in its static-protective package, touch it to an unpainted metal part of the system unit for at least two seconds. (This drains static electricity from the package and from your body.)

- Remove the device from its package and install it directly into your system unit without setting it down. If it is necessary to set the device down, place it in its static-protective package. Do not place the device on your blade server cover or on a metal table.

- Take additional care when handling devices during cold weather because heating reduces indoor humidity and increases static electricity.

Major components of the SBXL52 blade server

The following illustration shows the locations of major components in your blade server. You need to remove the blade server from the SBCE unit and remove the blade server cover to see the components.
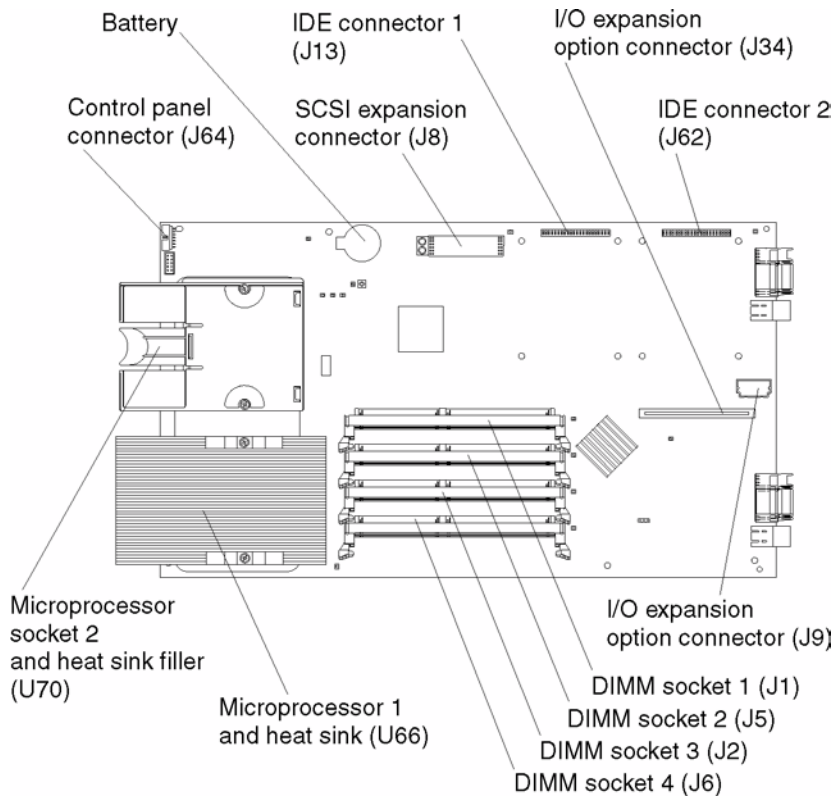
➥ **NOTE**
> The illustrations in this document might differ slightly from your hardware.
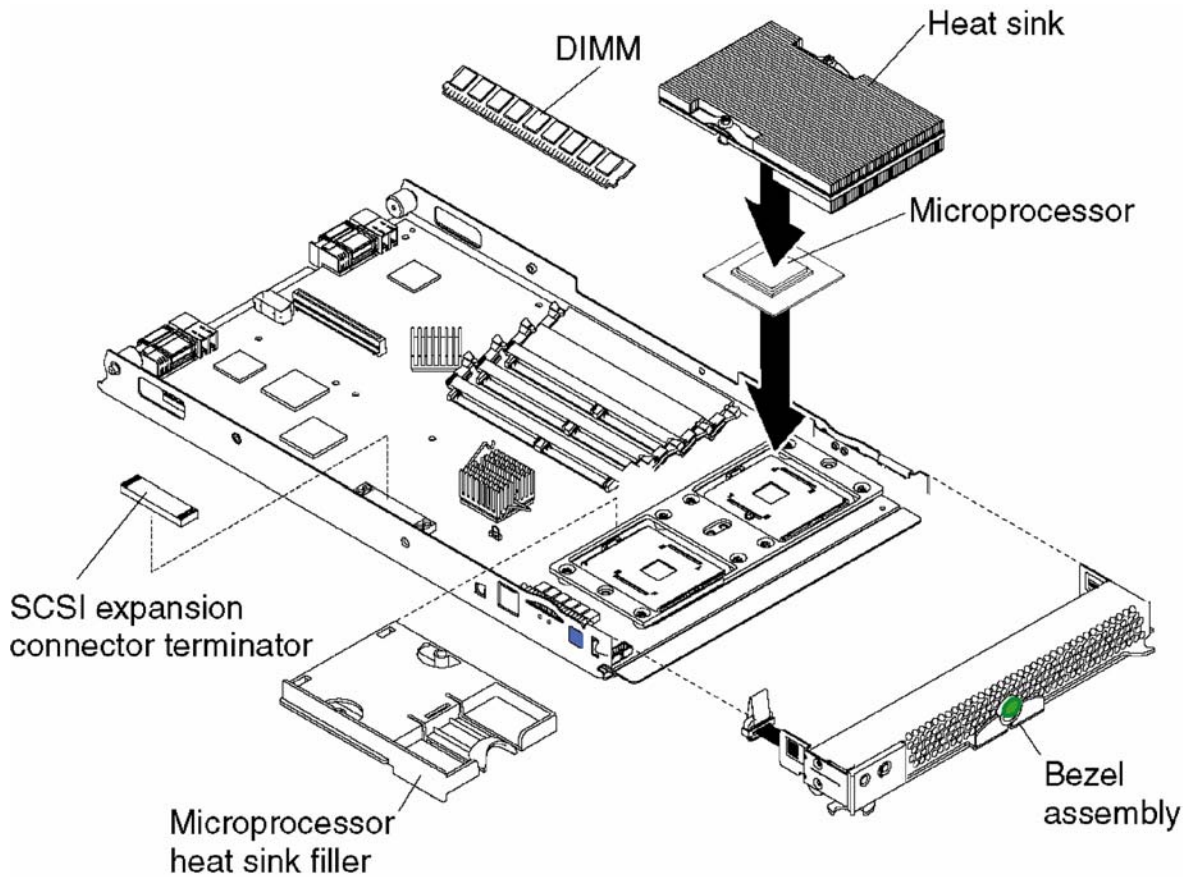
TP00255

System board illustration

The following illustration shows the location of the system-board components, including connectors for user-installable options.
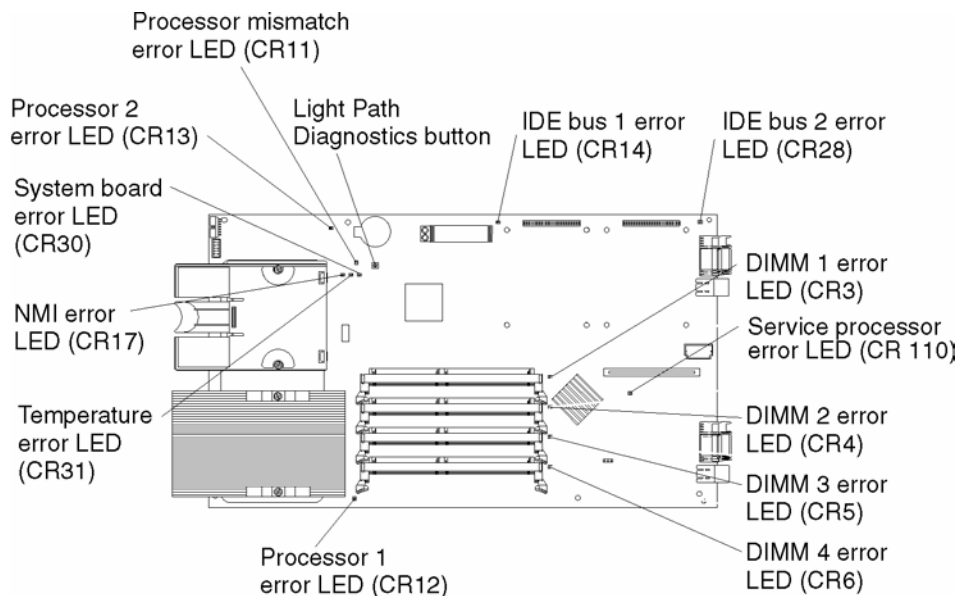

NOTE

> The SCSI expansion connector (J8) requires a terminator unless an expansion option is connected to it.

System board LED locations

The following illustration shows the location of the LEDs on the system board. You might need to refer to this illustration when solving problems with the blade server. You need to remove the blade server from the SBCE unit, open the cover, and press the light path diagnostics button to light any error LEDs that were turned on during processing.

☞ **NOTE**

> Power is available to relight the light path diagnostics LEDs for a short period of time after the blade server is removed from the SBCE unit. During that period of time, you can relight the light path diagnostics LEDs for a maximum of 25 seconds (or less, depending on the number of LEDs that are lit and the length of time the blade server is removed from the SBCE unit) by pressing the light path diagnostics button. The light path diagnostics power present LED (CR111) lights when the light path diagnostics button is pressed if power is available to relight the blade-error LEDs. If the light path diagnostics power present LED does not light when the light path diagnostics button is pressed, no power is available to light the blade-error LEDs and they will be unable to provide any diagnostic information.

Switches and jumpers

The following illustration shows the location of the switches and jumpers on the system board.
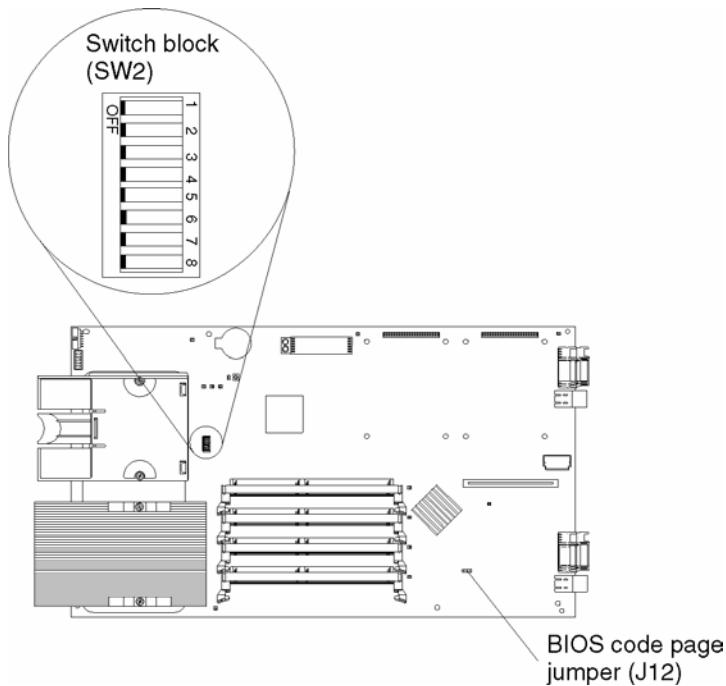
Switches

Table 1 describes the function of each switch on switch block (SW2).

| Switch number	Default value	Switch description
1 through 4	Off	Reserved.
5	Off	Power-on override. When toggled to On, this switch forces the blade server to turn on, overriding the power-on button. The power-on override switch should be used for debug purposes only and should not be used to override management module control of the server.
6 through 7	Off	Reserved
8	Off	Power-on password override. Changing the position of this switch bypasses the power-on password check the next time the blade server is turned on and starts the Configuration/Setup Utility program so that you can change or delete the power-on password. You do not need to move the switch back to the default position after the password is overridden. See "Using passwords" on page 14 for additional information about the power-on password.

Table 1. Switch block (SW2)

Jumpers

When the BIOS code page jumper (J12) is moved from pins 1 and 2 to pins 2 and 3, you can start the blade server from a backup BIOS page (see "Recovering the BIOS code" on page 25). The default position is pins 1 and 2.

☞ NOTE

If you start the blade server from the backup page because the primary BIOS page has become damaged, you need to flash the primary BIOS code.

Removing the blade server from the SBCE unit

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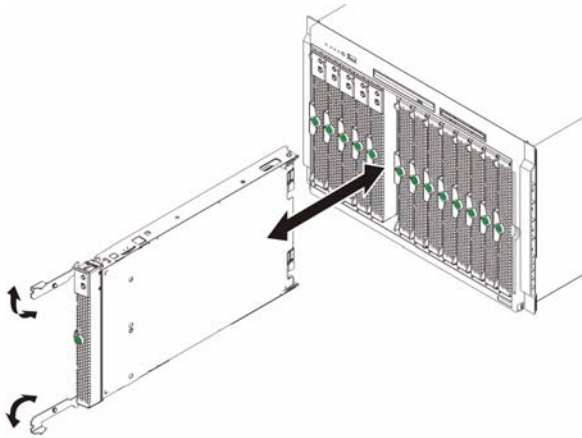

TP00213

Attention:

- To maintain proper system cooling, do not operate the SBCE unit for more than one minute without either a blade server, expansion unit, or filler blade installed in each blade bay.

- Note the bay number. Reinstalling a blade server into a different bay than the one from which it was removed could have unintended consequences. Some configuration information and update options are established according to bay number; if you reinstall the blade server into a different bay, you might need to reconfigure the blade server.

Complete the following steps to remove the blade server:

1. If the blade server is operating, shut down the operating system; then, press the power-control button (behind the blade server control panel door) to turn off the blade server. See "Blade server controls and LEDs" on page 6 for more information about the location of the power-control button.

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

2. Open the two release levers as shown in the illustration. The blade server moves out of the bay approximately 0.6 cm (0.25 inch).

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

4. Place either a filler blade or another blade server in the bay within one minute. The recessed spring-loaded doors will move out of the way as you insert the blade server or filler blade.

Opening the blade server cover

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

Blade-cover release

Blade-cover release
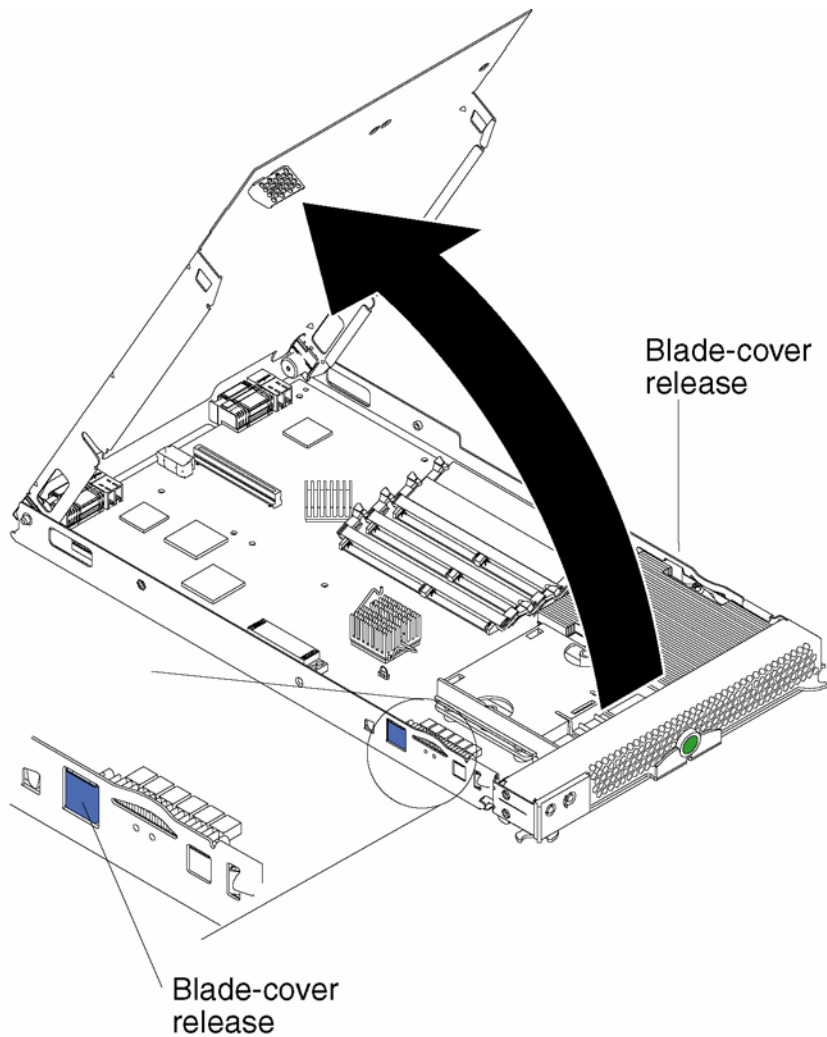
TP00257

Complete the following steps to open the blade server cover:

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27.

2. Carefully lay the blade server down on a flat, non-conductive surface, with the cover side up.

3. Press the blade-cover release on each side of the blade server and lift the cover open, as shown in the illustration.

4. Lay the cover flat, or lift it from the blade server.

⚠️ ⚡

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

Removing the blade server bezel assembly

To install certain options you must first remove the blade server bezel assembly. The following illustration shows how to remove the bezel assembly from a blade server.
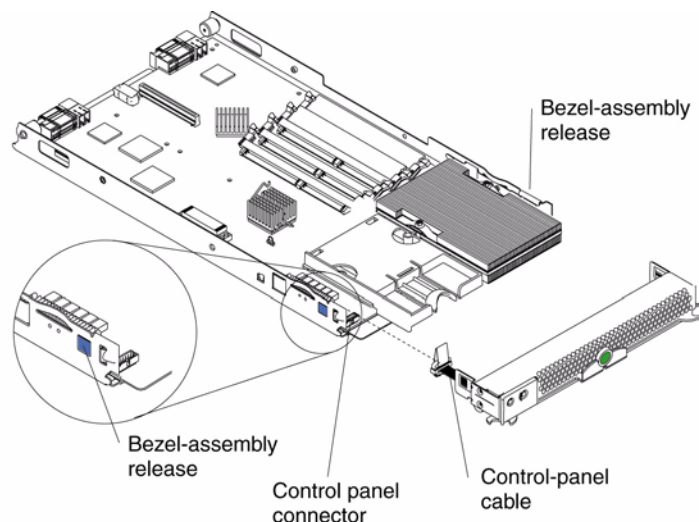
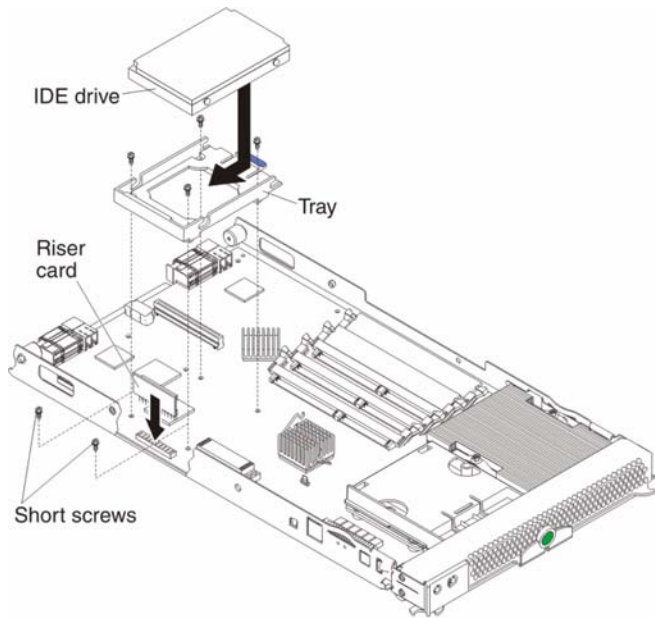Complete the following steps to remove the blade server bezel assembly:

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27.
2. Open the blade server cover.
3. Press the bezel-assembly release and pull the bezel assembly away from the blade server approximately 1.2 cm (0.5 inch).
4. Disconnect the control-panel cable from the control-panel connector.
5. Pull the bezel assembly away from the blade server.
6. Store the bezel assembly in a safe place.

Installing IDE hard disk drives

Your blade server has two connectors on the system board for installing optional 2.5-inch IDE hard disk drives. Each IDE connector is on a separate bus.

Two IDE drives can be used to implement and manage RAID level-1 under both the Linux and Microsoft Windows 2000 operating systems.

Attention: To maintain proper system cooling, do not operate the SBCE unit for more than one minute without either a blade server, expansion unit, or filler blade installed in each blade bay.

IDE drive

Tray

Riser card

Short screws

TP00262

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

NOTE

> Do not install a hard disk drive in IDE connector 2 if you intend to also install an optional I/O expansion card. The I/O expansion card occupies the same area as the second IDE hard disk drive.

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27.
2. Shut down the operating system, turn off the blade server, and remove the blade server from the SBCE unit. See "Removing the blade server from the SBCE unit" on page 33 for instructions.
3. Carefully lay the blade server on a flat, non-conductive surface.
4. Open the blade server cover. See "Opening the blade server cover" on page 33 for instructions.
5. Insert the riser card from the option kit into an IDE connector on the blade server system board.

   Important: Drives must be installed in the following order: IDE connector 1 (J13) first, then IDE connector 2 (J62).
6. Place the hard disk drive tray from the option kit over the riser card as shown in the illustration, aligning the tray with the screw holes on the system board. Two of the screw holes have screws in them.
7. Remove the tray temporarily; then, remove the two screws from the screw holes on the system board and replace the tray. Secure the tray to the system board with screws from the kit.
8. Set any jumpers or switches on the hard disk drive.

   Important: Both IDE hard disk drives must be set to Master.

   Attention: Do not press on the top of the hard disk drive. Pressing the top could damage the hard disk drive.

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

10. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 51.

Installing memory modules

You can increase the amount of memory in your blade server by installing memory-module options. When you install memory, you must install a pair of matched dual inline memory modules (DIMMs).

Notes:

1. The system board contains four DIMM connectors and supports two-way memory interleaving.

2. The DIMM options available for your blade server are 256 MB, 512 MB, and 1 GB. The blade server supports a minimum of 512 MB and a maximum of 4 GB of system memory.

3. A minimum of two DIMMs, installed in the DIMM 3 and DIMM 4 memory connectors (J2 and J6, respectively), is required. When you install additional DIMMs, be sure to install them as a pair, in DIMM connectors 1 and 2 (J1 and J5).

   Install the DIMMs in the following order:

Pair	DIMM connectors
First	3 and 4 (J2, J6)
Second	1 and 2 (J1, J5)

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

5. The second pair does not have to be DIMMs of the same size, speed, type, and technology as the first pair.

6. Install only 2.5 V, 184-pin, double-data-rate (DDR), PC2100, registered synchronous dynamic random-access memory (SDRAM) with error correcting code (ECC) DIMMs. These DIMMs must be compatible with the latest PC2100 SDRAM Registered DIMM specification, which is available from http://www.jedec.org/. For a list of supported options for your blade server, reference Intel's Memory Qualification List or contact your Intel Support Representative.

7. PC2100 DIMMs are backward-compatible and work in the PC1600 sockets.

8. Installing or removing DIMMs changes the configuration information for the blade server. Therefore, after installing or removing a DIMM, you must change and save the new configuration information by using the Configuration/Setup Utility program. When you restart the blade server, the system displays a message indicating that the memory configuration has changed. Start the Configuration/Setup Utility program and select **Save Settings**. See "Configuration/Setup Utility menu choices" on page 11 for more information.

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

DIMM socket 1 (J1)
DIMM socket 2 (J5)

DIMM socket 3 (J2)
DIMM socket 4 (J6)
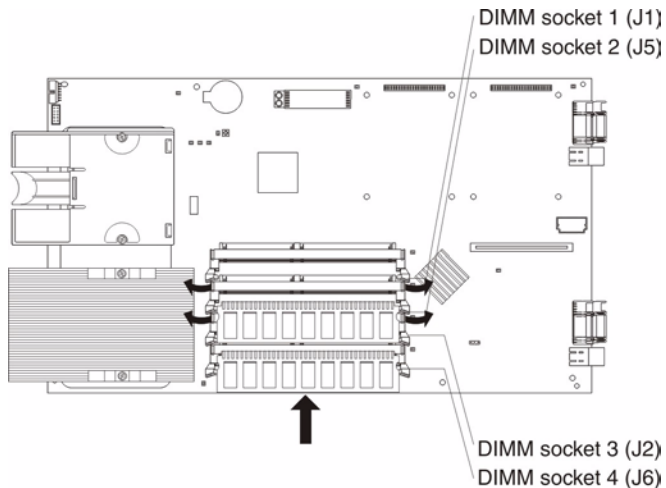
Before you begin, read the documentation that comes with your option.

Complete the following steps to install a DIMM:

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27.

2. Shut down the operating system, turn off the blade server, and remove the blade server from the SBCE unit. See "Removing the blade server from the SBCE unit" on page 33 for instructions.

3. Carefully lay the blade server on a flat, non-conductive surface.

4. Open the blade server cover. See "Opening the blade server cover" on page 33 for instructions.

5. Locate the DIMM connectors on the system board. Determine the connectors into which you will install the DIMMs. (See note 3 on page 37)

6. Touch the static-protective package that contains the DIMM option to any *unpainted* metal surface on the SBCE chassis or any *unpainted* surface on any other grounded rack component. Then, remove the DIMM from the package.

7. To install the DIMMs, repeat the following steps for each DIMM that you install:

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

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

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

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

8. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 51.

Installing an additional microprocessor

Your blade server supports two microprocessors. With two microprocessors, your blade server can operate as a symmetric multiprocessing (SMP) server. With SMP, certain operating systems and application programs can distribute the processing load between the microprocessors. To use SMP,

obtain an SMP-capable operating system. For a list of supported operating systems and other options, contact your Intel Support Representative.

Attention: To ensure proper blade server operation when you install a second microprocessor, observe the following precautions:

- Always install microprocessors that have the same cache size and type, the same clock speed, and identical internal and external clock frequencies (including system bus speed).

- Ensure that the microprocessor with the lowest feature set is the startup (bootstrap) microprocessor installed in the Microprocessor 1 socket (location U66).

Notes:

1. Thoroughly review the documentation that comes with the microprocessor, so that you can determine whether you need to update the blade server BIOS code. Contact your Intel Support Representative for the latest level of BIOS code for your blade server.

2. The microprocessor sockets in this server contain built-in termination for the microprocessor bus; therefore, no terminator card is required if a second microprocessor is not installed in microprocessor socket 2. However, for proper airflow, this socket must contain a microprocessor heat-sink filler, sometimes called a microprocessor baffle.

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

The following illustration shows how to install the second microprocessor on the system board.
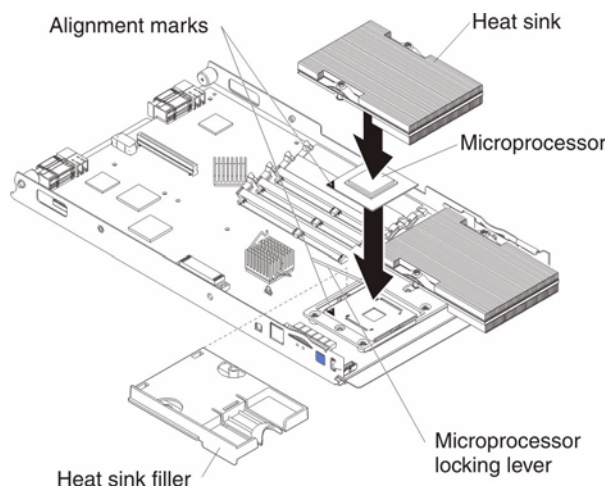

Complete the following steps to install an additional microprocessor:

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27.

2. Shut down the operating system, turn off the blade server, and remove the blade server from the SBCE unit. See "Removing the blade server from the SBCE unit" on page 33 for instructions.

3. Carefully lay the blade server on a flat, non-conductive surface.

4. Open the blade server cover (see "Opening the blade server cover" on page 33 for instructions).

5. Remove the bezel assembly (see "Removing the blade server bezel assembly" on page 35 for instructions).

6. Locate the microprocessor socket on the system board.

7. Remove the heat-sink filler.
8. Install the microprocessor:
   a. Remove the protective cover, tape, or label from the surface of the microprocessor socket, if one is present.
   b. Touch the static-protective package containing the new microprocessor to any *unpainted* metal surface on the SBCE chassis or any *unpainted* surface on any other grounded rack component; then, remove the microprocessor from the package.
   c. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops or clicks in the fully open position (approximately a 135° angle), as shown.

   Attention: You must ensure that the locking lever on the microprocessor socket is in the fully open position before you insert the microprocessor in the socket. Failure to do so might result in permanent damage to the microprocessor, microprocessor socket, and system board.

Lever closed

Lever fully open

or

Lever closed

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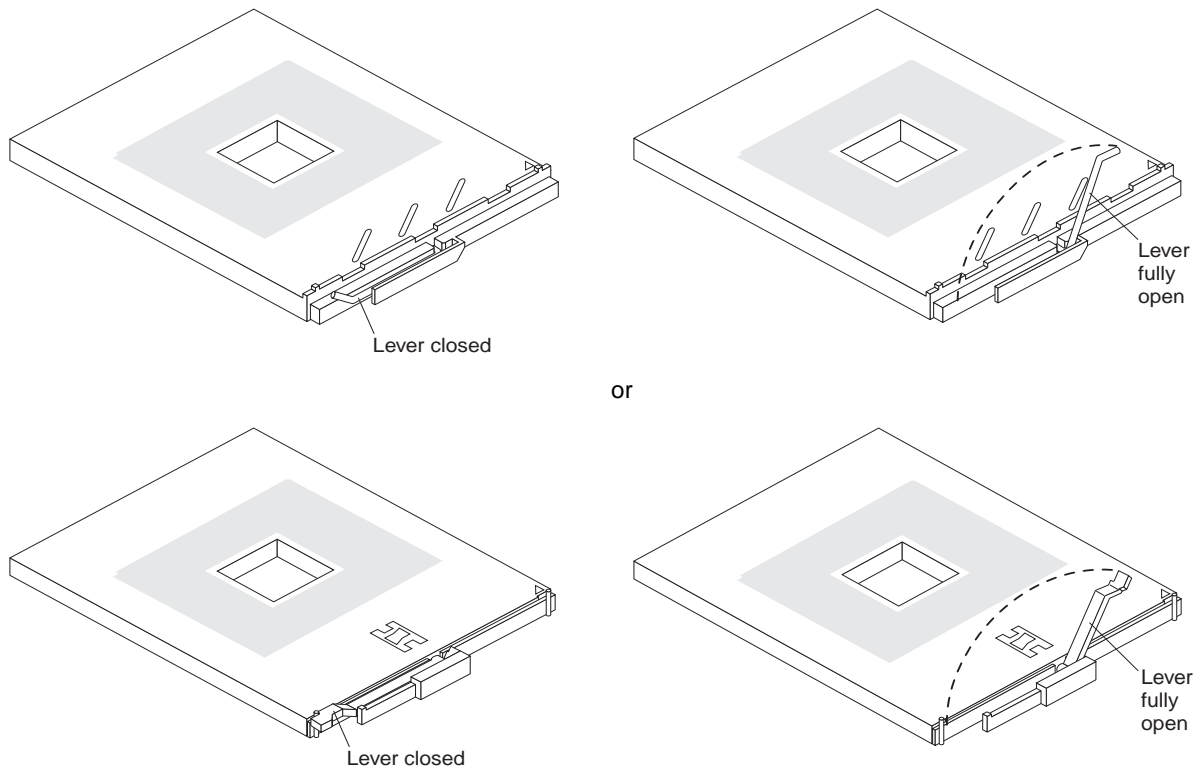
   d. Center the microprocessor over the microprocessor socket. Align the triangle on the corner of the microprocessor with the triangle on the corner of the socket and carefully press the microprocessor into the socket.

   Attention:

   • Do not use excessive force when pressing the microprocessor into the socket.

   • Make sure that the microprocessor is oriented and aligned correctly in the socket before you try to close the lever.

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

9. Install a heat sink on the microprocessor:

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

        Attention:

        1) Do not set down the heat sink after you remove the plastic cover.

Heat sink   Thermal grease
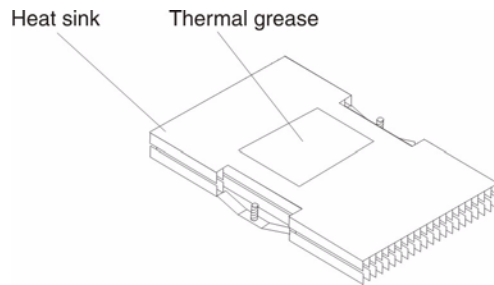
        2) Do not touch the thermal grease on the bottom of the heat sink. Touching the thermal grease will contaminate it. If the thermal grease on the microprocessor or heat sink becomes contaminated, contact your service technician.

    b. Align and place the heat sink on top of the microprocessor in the retention bracket, grease side down. Press firmly on the heat sink.

    c. Using a screwdriver, secure the heat sink to the retention bracket on the system board using the two captive mounting screws. Press firmly on the screws and tighten them, alternating between them. Do not overtighten the screws.

10. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 51.

Installing an I/O expansion card

You can add an optional I/O expansion card to your blade server to give the blade server additional network connections for communicating on a network.

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

⊷ Important

Installation of an I/O expansion card requires removal of the hard disk drive installed in IDE connector 2. The I/O expansion card occupies the same space as this hard disk drive and replaces it. You can not install a hard disk drive in IDE connector 2 while an I/O expansion card is installed in the blade server.

- If the hard disk drive installed in IDE connector 2 contains any information that you want to keep, back it up to another storage device.
- If the hard disk drive installed in IDE connector 2 is part of a RAID array, unconfigure this RAID array before removing the hard disk drive. See your operating system documentation for instructions.

The following illustration shows how to install an I/O expansion card on the blade server. The card is installed near IDE connector 2.
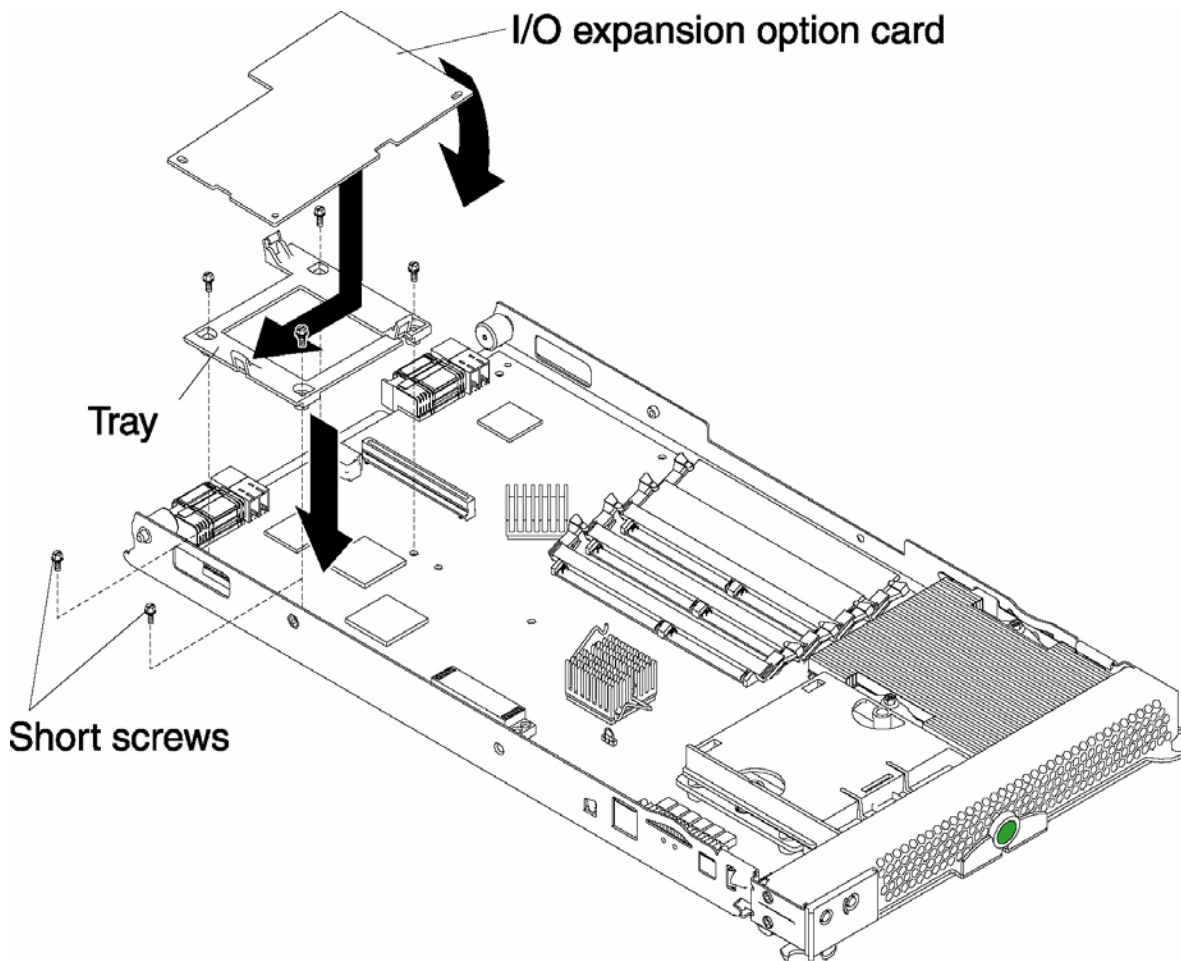
TP00259

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

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27.
2. Shut down the operating system, turn off the blade server, and remove the blade server from the SBCE unit (see "Removing the blade server from the SBCE unit" on page 33 for information).
3. Carefully lay the blade server on a flat, non-conductive surface.
4. Open the cover (see "Opening the blade server cover" on page 33 for instructions).

5. If an IDE hard disk drive is in IDE connector 2, remove the hard disk drive and tray (save the screws that secured the tray to the system board); otherwise, remove the two screws near IDE connector 2 that secure the system board to the chassis, as shown in the illustration.

6. Install the I/O expansion card:
   a. Install the I/O expansion card tray. Secure the tray to the system board with the screws from the option kit, as shown in the illustration.
   b. Orient the I/O expansion card as shown in the illustration.
   c. Slide the notch in the narrow end of the card into the raised hook on the tray; then, gently pivot the wide end of the card into the I/O expansion card connectors, as shown in the illustration.

   ⌐ **NOTE**
   > For device driver and configuration information to complete the installation of the I/O expansion card, see the documentation that comes with the option. Some documentation might also be on the *SBCE Documentation* CD that comes with the SBCE unit.

7. If you have other options to install or remove, do so now; otherwise, go to "Completing the installation" on page 51.

Installing a SCSI storage expansion unit

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

⌐ **Important**

⌐ To avoid potential performance and reliability problems when configuring or replacing drives in a mirrored configuration, ensure that the storage capacities and speeds of the drives are identical.

Notes:
1. After you install the SCSI storage expansion unit on your blade server, the blade server and expansion unit become a single unit that occupies two blade bays in the SBCE unit.
2. To ensure proper cooling and system reliability, make sure that each of the SCSI hard disk drive bays on the SCSI storage expansion unit contains either a hot-swap SCSI hard disk drive or a filler panel.

For a list SCSI hard disk drives supported by your blade server, refer to Intel's "Tested Hardware and Operating Systems List" for this product.

The following illustration shows how to install the SCSI storage expansion unit on the blade server.

SCSI storage expansion option

Cover pins

Blade-cover release

Terminator

Blade-cover release
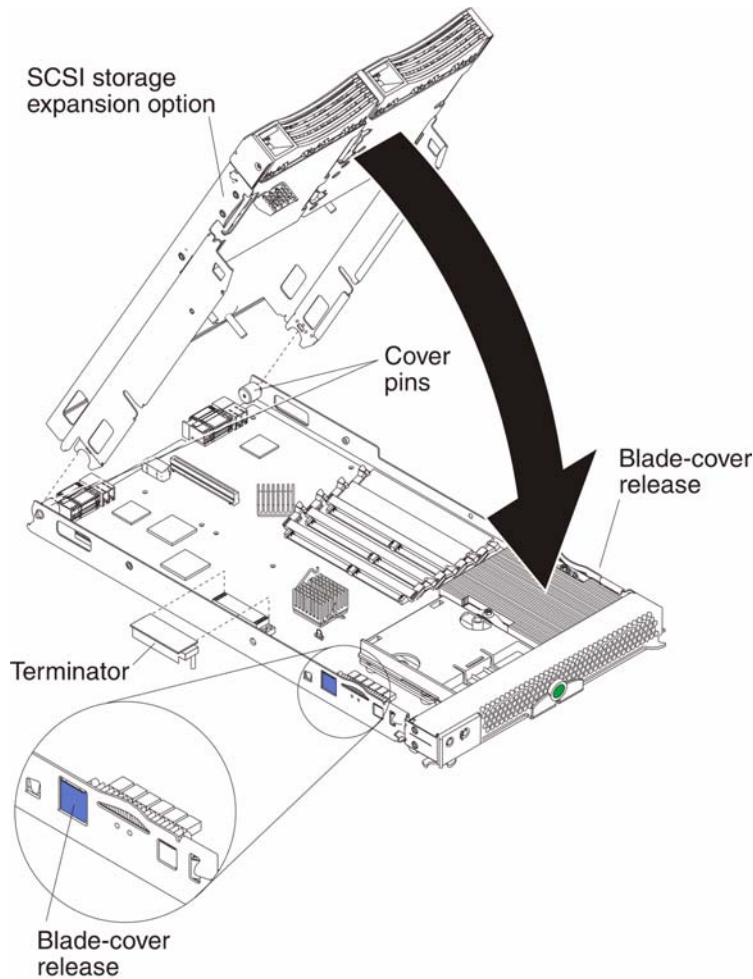
TP00260

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

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27.

2. Shut down the operating system, turn off the blade server, and remove the blade server from the SBCE unit (see "Removing the blade server from the SBCE unit" on page 33 for instructions).

3. Carefully lay the blade server on a flat, non-conductive surface.

4. Remove the blade server cover.

   a. Open the blade server cover (see "Opening the blade server cover" on page 33 for instructions) and lift it off the blade server.

   b. Store the cover in a safe place.

5. Locate the SCSI connector on the system board and remove the terminator from the connector.

6. Install the SCSI storage expansion unit:

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

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

c. Pivot the storage expansion unit closed and press it firmly into place until the cover-release latches click. The connector on the expansion unit automatically aligns with and plugs into the SCSI expansion connector (J8) on the system board.

7. Insert the combined blade server and expansion unit into two adjacent SBCE unit bays.

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

8. Turn on the blade server.

9. If you have not already done so, install the LSI device drivers for your operating system. LSI device drivers are on the *Resource* CD that comes with the SBCE unit. You can also get the latest version of the drivers from your Intel Support Representative.

With the storage expansion unit installed on your blade server, you can install up to two hot-swap SCSI hard disk drives in the option and configure them for embedded mirroring (RAID level1). Each SCSI device must have a unique SCSI ID. This ID enables the SCSI controller in the I/O expansion card to identify the device and ensure that different devices on the same SCSI channel do not attempt to transfer data simultaneously. The SCSI IDs for the hard disk drives in the expansion unit are permanent (not configurable). Table 2 lists the SCSI IDs for the hard disk drives that are installed in the expansion unit. See "Installing a SCSI hot-swap hard disk drive" for instructions for installing hard disk drives.

Device	SCSI ID
Drive bay 1	0
Drive bay 2	1

Table 2. SCSI IDs for hot-swap hard disk drives in the expansion unit

⊷ **NOTE**
SCSI ID 7 is usually reserved for the SCSI controller; however, this SCSI ID is changeable through the LSI configuration program program utility.

Use the Configuration/Setup Utility program in the blade server to enable or disable the SCSI controller in the storage expansion unit. See the documentation that comes with the storage expansion unit for information about configuring the storage expansion unit and SCSI hard disk drives.

Installing a SCSI hot-swap hard disk drive

If you have installed a SCSI storage expansion unit on the blade server, you can install up to two SCSI hot-swap hard disk drives in the bays in the expansion unit.
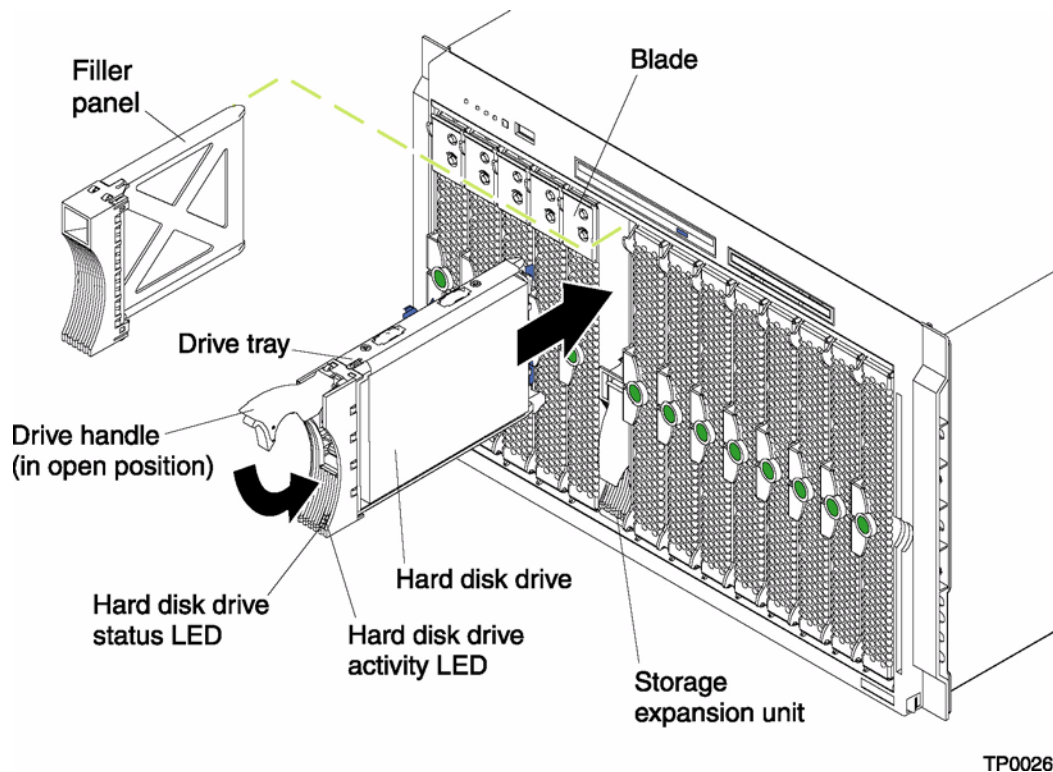
If a hot-swap hard disk drive in the expansion unit fails, you can replace it without turning off the blade server. Therefore, you have the advantage of continuing to operate your blade server while a hard disk drive in this unit is removed or installed.

Each hot-swap hard disk drive has two indicator LEDs. If the amber hard disk drive status LED for a hard disk drive is lit continuously, that hard disk drive is faulty and must be replaced.

Each hot-swap hard disk drive that you plan to install must be mounted in a hot-swap-drive tray. The hard disk drive must have a Single Connector Attachment (SCA) connector. Hot-swap-drive trays come with the hot-swap hard disk drives.

For a list of SCSI hard disk drives supported by your blade server, refer to the "Intel Tested Hardware and Operating System List".

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

Complete the following steps to install a SCSI hot-swap hard disk drive in a storage expansion unit.

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

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27.
2. Remove the filler panel from one of the empty hot-swap bays by inserting your finger into the depression at the top of the filler panel and pulling it away from the expansion unit.
3. Install the SCSI hot-swap hard disk drive:
   a. Ensure that the tray handle is open (that is, perpendicular to the hard disk drive).
   b. Align the hard disk drive assembly with the guide rails in the bay.
   c. Gently push the hard disk drive assembly into the bay until it stops.
   d. Push the tray handle to the closed (locked) position.
   e. Check the hard disk drive LEDs to verify that the hard disk drive is operating properly.

- If the amber hard disk drive status LED for a hard disk drive is lit continuously, that hard disk drive is faulty and needs to be replaced.
- If the green hard disk drive activity LED is flashing, the hard disk drive is being accessed.

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

Replacing a SCSI hot-swap hard disk drive

If a hard disk drive in the storage expansion unit fails, you can replace it without turning off the blade server.
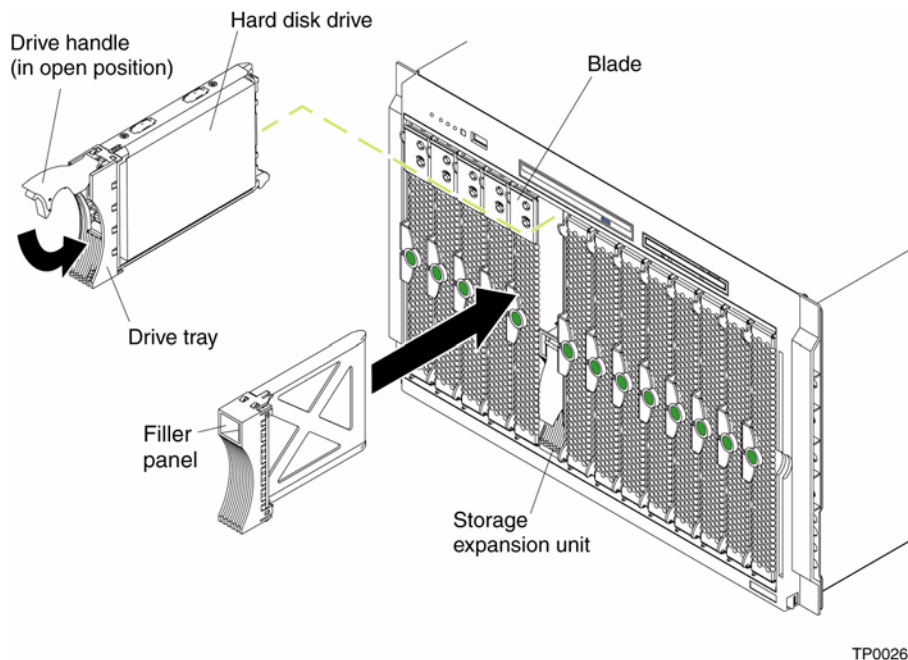
Complete the following steps to replace a SCSI hot-swap hard disk drive in a storage expansion unit hot-swap bay.

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

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27.
2. Locate the defective hard disk drive (look for an amber status LED that is lit on the front of the hard disk drive).
3. Make sure the hard disk drive has stopped spinning.
4. Move the handle on the hard disk drive to the open position (perpendicular to the hard disk drive), and pull the hot-swap hard disk drive assembly from the bay.
5. Within one minute, install the replacement hard disk drive in the hot-swap bay (see "Installing a SCSI hot-swap hard disk drive" on page 45 for instructions).

Replacing the battery

The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.

If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.

— **NOTE**

> After you replace the battery, you must reconfigure your blade server and reset the system date and time.

✕✕**CAUTION:**

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

Do not:

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

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

Complete the following steps to replace the battery:

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27.
2. Follow any special handling and installation instructions supplied with the battery.
3. Turn off the blade server and remove the blade from the SBCE unit (see "Removing the blade server from the SBCE unit" on page 33 for instructions).
4. Open the blade server cover (see "Opening the blade server cover" on page 33 for instructions).
5. Locate the battery on the system board.
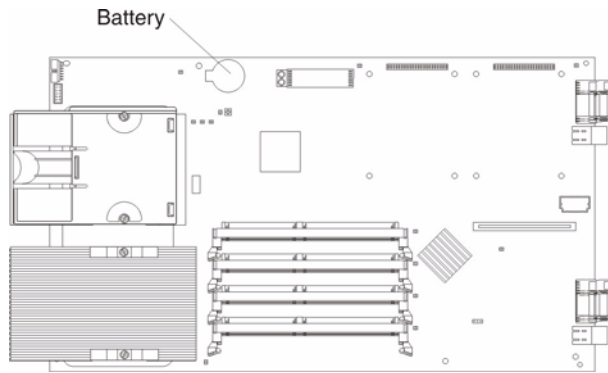
Battery

6. Remove the battery:

    a. Use your finger to press down on one side of the battery; then, slide the battery out from its socket. The spring mechanism will push the battery out toward you as you slide it from the socket.
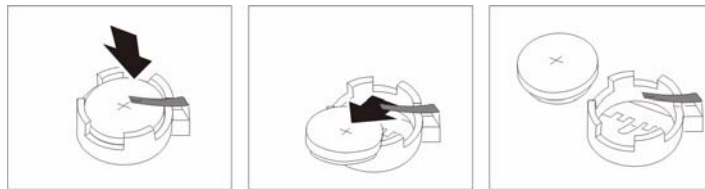
    > **NOTE**
    > You might need to lift the battery clip slightly with your fingernail to make it easier to slide the battery.

   b. Use your thumb and index finger to pull the battery from under the battery clip.

    > **NOTE**
    > After you remove the battery, ensure that the battery clip is touching the base of the battery socket by pressing gently on the clip.

7. Insert the new battery:

    a. Tilt the battery so that you can insert it into the socket, under the battery clip.

    b. As you slide it under the battery clip, press the battery down into the socket.
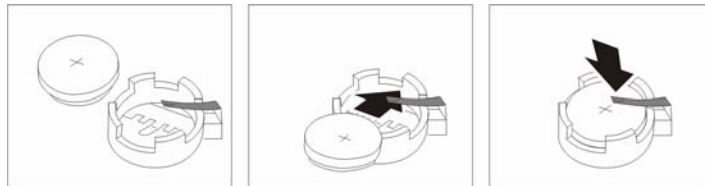
8. Close the blade server cover (see "Closing the blade server cover" on page 52).

⊗⊗CAUTION:

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

9. Reinsert the blade server into the bay in the SBCE unit.
10. Turn on the blade server.
11. Start the blade server Configuration/Setup Utility program and set configuration parameters as needed. See "Using the Configuration/Setup Utility program" on page 11 for information.

Completing the installation

To complete the installation, perform the following tasks. Instructions for each task are in the following sections.

1. Reinstall the blade server bezel assembly, if you removed it (see "Installing the blade server bezel assembly").
2. Close the blade server cover, unless you installed the SCSI storage expansion unit option (see "Closing the blade server cover" on page 52).

⊗⊗CAUTION:

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

3. Reinstall the blade server into the SBCE unit (see "Installing the blade server in the SBCE unit" on page 54).
4. Turn on the blade server (see "Turning on the blade server" on page 5).
5. For certain options, run the blade server Configuration/Setup Utility program (see "Updating your blade server configuration" on page 56).

NOTE

If you have just connected the power cords of your SBCE unit to electrical outlets, you will have to wait until the power-on LED on the blade server flashes slowly before pressing the power-control button on a blade server.

Installing the blade server bezel assembly

The following illustration shows how to install the bezel assembly on the blade server.
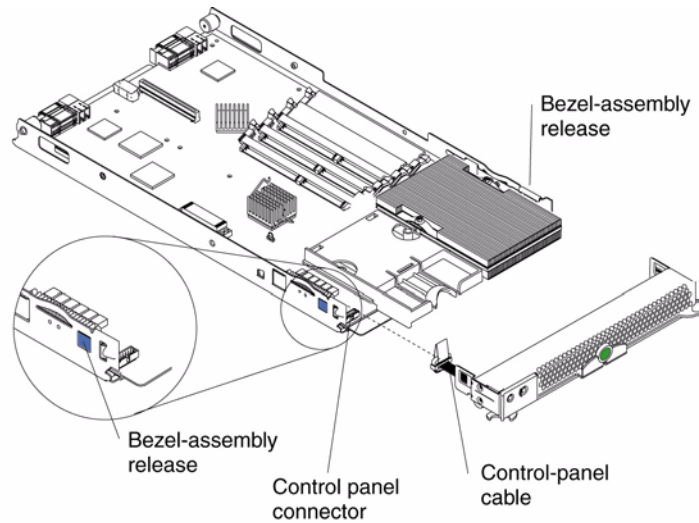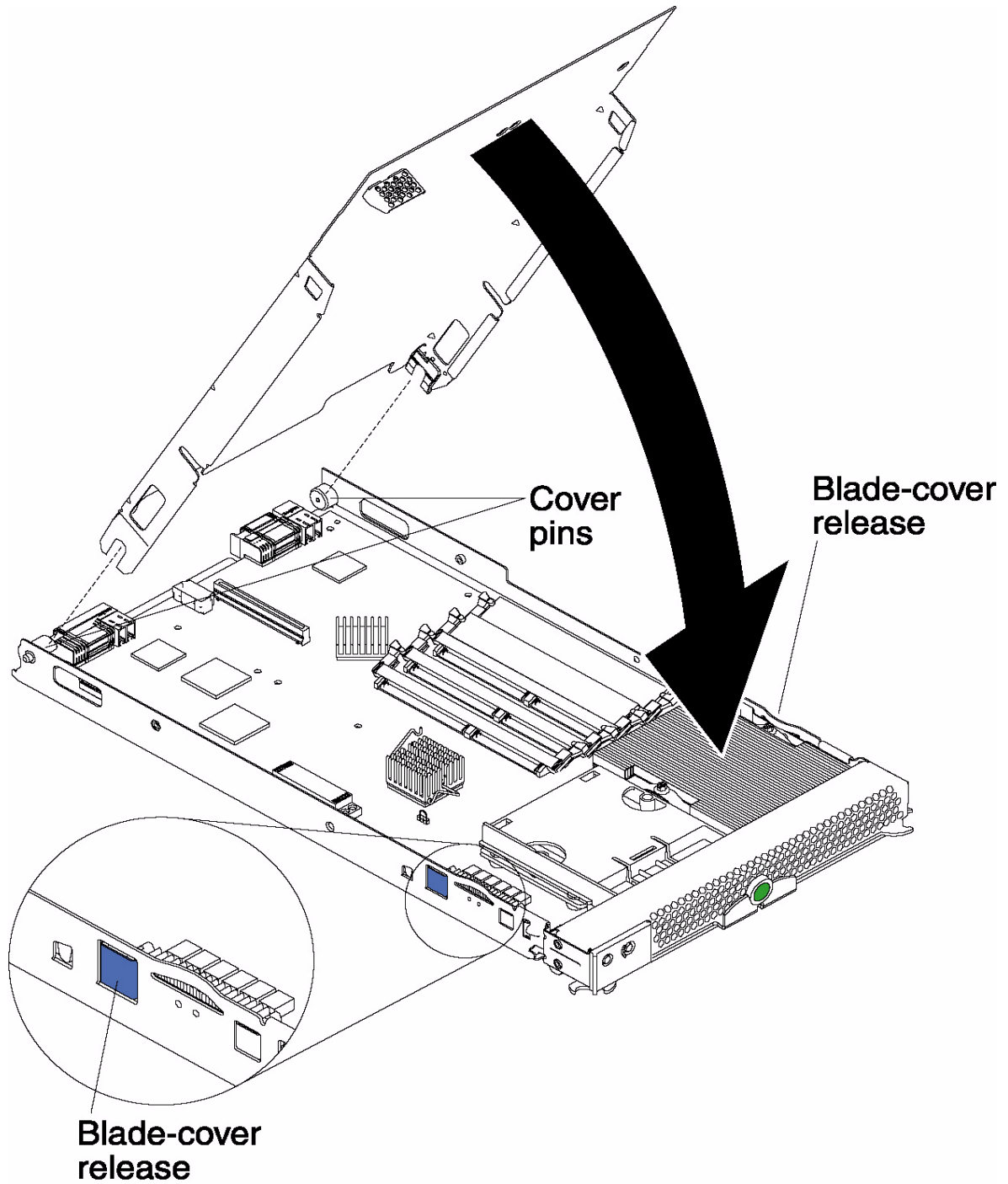
TP00258

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

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27..
2. Connect the control-panel cable to the control-panel connector on the system board.
3. Carefully slide the bezel assembly onto the blade server as shown in the illustration, until it clicks into place.

Closing the blade server cover

Important: The blade server cannot be inserted into the SBCE unit until the cover is installed and closed, or a SCSI storage expansion unit is installed. Do not attempt to override this protection.

The following illustration shows how to close the blade server cover.

Cover
pins

Blade-cover
release

Blade-cover
release

TP00265

Complete the following steps to close the blade server cover:

1. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27.

2. If you removed the blade bezel assembly, replace it now. See "Installing the blade server bezel assembly" on page 51 for instructions.

3. Lower the cover so that the slots at the rear slide down onto the pins at the rear of the blade server, as shown in the illustration. Before 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.

4. Pivot the cover to the closed position as shown in the illustration, until it clicks into place.

Installing the blade server in the SBCE unit
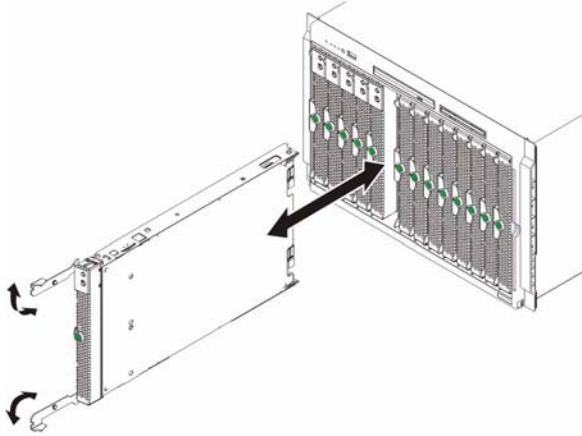
TP00213

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

⚠️ ⚡

××**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. Review "Electrical Safety" on page vi and "Installation guidelines" on page 27 through "Handling static-sensitive devices" on page 27.

2. If you have not done so already, install any options needed, such as disk drives or memory, in the blade server.

3. Select the bay for the blade server.

   Notes:

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

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

    c. To help ensure proper cooling, performance, and system reliability, make sure that each of the blade bays on the front of the SBCE unit has a blade server, expansion unit, or filler blade installed. Do not operate the SBCE unit for more than one minute without either a blade server, expansion unit, or filler blade installed in each blade bay.

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

5. Slide the blade server into the bay until it stops. The spring-loaded doors further back in the bay that cover the bay opening move out of the way as you insert the blade server.

6. Push the release levers on the front of the blade server closed.

7. Turn on the blade server. See "Turning on the blade server" on page 5 for instructions.

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

9. If desired, write identifying information on one of the user labels that come with the blade server; then, place the label on the SBCE bezel just below the blade server, as shown in the following illustration.
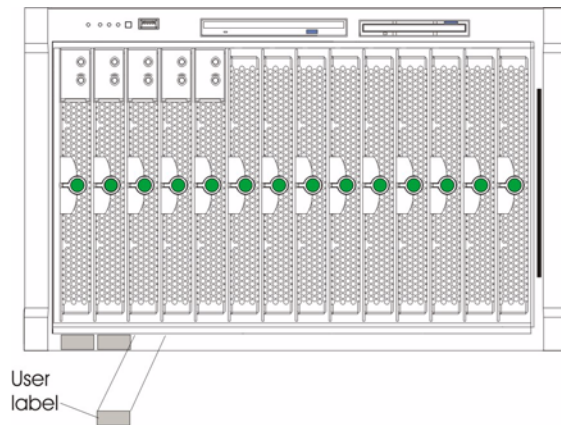
TP00216

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

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

Attention: If you reinstall a blade server that you removed, you must install it in the same 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 bay than the one from which it was removed could have unintended consequences and you might need to reconfigure the blade server.

If this is the initial installation for a blade server in the SBCE unit, you need to configure the blade server with the blade server Configuration/Setup Utility and install the blade server operating system. See "Updating your blade server configuration" on page 56 and Chapter 7, "Installing the operating system," on page 57 for details.

Updating your blade server configuration

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

Some options have device drivers that you need to install. See the documentation that comes with your option for information about installing any required device drivers.

Your blade server comes with one or two microprocessors installed on the system board. If your blade server comes with two microprocessors, or your blade server comes with one microprocessor and you have installed an additional microprocessor, your blade server can now operate as an SMP server. Therefore, you might need to upgrade your operating system to support SMP. See Chapter 7, "Installing the operating system," on page 57 and your operating-system documentation for additional information.

Input/output connectors and devices

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

The blade server has two selection buttons on the control panel: the CD/diskette/USB select button and the keyboard/mouse/video select button. See "Blade server controls and LEDs" on page 6 for information about these buttons and their function.

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

7 Installing the operating system

This section outlines quick installation procedures for local operating system installations only.

The operating system in the blade server must provide USB support for the blade server to recognize and use the keyboard, mouse, CD-ROM drive, and diskette drive. The SBCE chassis uses USB for internal communication with these devices.

Some operating systems, such as Red* Hat Linux* 9.0, permit you to select the type of mouse being used. If offered this choice, select USB instead of PS/2. Although the mouse is a PS/2-style device, communication with the mouse is through an internal USB bus in the chassis; therefore, the operating system in your blade server must recognize the mouse as a USB device.

☞ **NOTE**

- It can take approximately 20 seconds to switch the keyboard, video, and mouse or the CD-ROM drive, diskette drive, and USB port to the blade server.

- Although the keyboard attached to the SBCE unit is a PS/2-style keyboard, communication with it is through a USB bus. When you are running an operating system that does not have USB drivers, such as in the following instances, the keyboard responds very slowly.

  — Running the blade server integrated diagnostics

  — Running a BIOS update diskette on a blade server

  — Updating the diagnostics on a blade server

- If you install Microsoft* Windows* Server 2003 on the blade server while it is not the current owner of the keyboard, video, and mouse, a delay of up to one minute occurs the first time you switch the keyboard, video, and mouse to the blade server. During this one-time-only delay, the blade server Device Manager enumerates the keyboard, video, and mouse and loads the device drivers. All subsequent switching takes place in the normal keyboard-video-mouse switching time frame.

Microsoft* Windows* Server 2003 Enterprise Edition installation instructions

Complete the following steps to perform a basic installation of Microsoft Windows Server 2003 Enterprise Edition.

- On the blade server on which you are installing the operating system, press the CD select button to associate that blade server with the CD, diskette, and USB port. Then, press the KVM select button to associate that blade server with the keyboard, monitor, and mouse.

- Insert the Microsoft Windows Server 2003 Enterprise Edition CD into the CD-ROM drive. The blade server on which the installation will take place starts from the CD. The message "Setup is inspecting your blade server's hardware configuration" is displayed.

- If the blade server has a small computer system interface (SCSI) storage expansion unit installed, press F6 to install a SCSI or redundant array of independent disks (RAID) device driver. If the blade server does not have a SCSI storage expansion unit installed, continue with step 5. Prior to proceeding to step 5, extract the LSI drivers from the system resource cd.

- In the Setup window, specify a controller and press the S key to specify any additional devices you might want.

- When you are prompted to insert the manufacturer's hardware support diskette to install the onboard LSI SCSI controller, insert the diskette that contains the LSI Logic PCI SCS/FC device driver into the diskette drive and press Enter.

- Select the LSI Logic PCI SCSI/FC MPI Miniport device driver and press Enter.

- Specify any additional CD-ROM drives you want to use and press Enter.

- When the Setup window opens, press Enter to install Microsoft Windows Server 2003 Enterprise Edition.

- In the Licensing Agreement window, read the licensing agreement and press the Page Down key to scroll to the bottom of the window. Then, click "<F8> I Agree". All hard disk drives and drive partitions that are available on the blade server are displayed.

- Select one of the following partitioning options:
  — To create a partition on a hard disk drive in the blade server, highlight non-partitioned space for that hard disk drive, and press the C key. You are prompted to indicate how much available space you want to allocate from the non-partitioned drive. Type the amount of space (in MB) and press Enter.
  — To permanently delete a partition, to allow enough room to create new partitions, press the D key when the message, "Are you sure you want to delete this partition?", is displayed. Press Enter. The same message is displayed again. Press the L key to permanently delete the partition.
  — To permanently delete a partition, to allow enough room to create new partitions, press the D key when the message "Are you sure you want to delete this partition?" is displayed. Press Enter. The same message is displayed again. Press the L key to permanently delete the partition.
  — When you are prompted to choose a file system, select NTFS file system unless you will configure the blade server for dual boot with an operating system that does not support NT File System (NTFS). The formatting process will take up to 20 minutes.

- The blade server restarts, and the setup wizard installs Microsoft Windows Server 2003 Enterprise Edition. When the installation is complete, the Welcome window opens.

- Click Next. Setup automatically installs device drivers and configures your blade server devices. This process takes several minutes to complete. Depending on the optional hardware that may be installed, it may be necessary to install device drivers from the appropriate resource cd for the installed item.

- In the Regional Settings and Language Options window, make the appropriate modification and click Next.

⊷ **NOTE**

To modify your regional settings after you have installed Microsoft Windows Server 2003

Enterprise Edition, click Control Panel -> Regional Options and make the appropriate modification.

* In the Personalize Your Software window, in the Name field, type your name, and in the Organizations field, type the organization name. Click Next.

  — **NOTE**

  The names you type will be used as default blade server names. Applications that you install on the blade server will use the same information for the product registration and document identification.

* When you are prompted for the CD-Key, type the CD-Key in the applicable fields. Click Next

* In the Name and Administrator Password window, type the blade server name and password that you want and click Next. (Notice that Setup uses the organization name that you specified earlier as a suggested name for the blade server.)

  — **NOTE**

  Passwords are case sensitive. Use a combination of uppercase and lowercase letters with at least one number for your password.

Select or deselect the components you want to include in the installation process. To install a component, select the check box Next to the component. Components that you do not select will not be installed. Click Next.

In the Time Zone window, set the current time and zone. To change the date, click the button to the right of the date. To change the time, highlight the value you want to change and type the correct value, or use the Up Arrow and Down Arrow keys to make your selection. Click Next.

  — **NOTE**

  NOTE: Microsoft Windows Server 2003 Enterprise Edition performs many tasks that are dependent on accurate blade server time and date settings. Be sure to select the correct time zone for the blade server location to avoid problems.

Microsoft Windows Server 2003 Enterprise Edition will automatically install networking components. If prompted in the Networking Settings window, select either Typical or Custom Settings. If you are prompted, type the appropriate network information. Click Next. Disregard if not prompted for network settings and accept default settings. The network may be configured at a later time once the system installation has been completed.

In the Workgroup window or Windows Domain window, select one of the following options:

— No, this computer is not on a network, or it is a network without a domain.

— Yes, make this computer a member of the following domain

— Type the workgroup or domain name in the applicable field and click Next.

Setup installs and configures the remaining operating-system components according to the options you specified. The status is displayed in the Installing Component window. This process will take several minutes. Setup finishes copying the files and displays the status in the Performing Final Tasks window. This process takes several minutes.

- Remove the CD from the CD-ROM drive and click Finish. The blade server restarts.

- Press Ctrl+Alt+Delete and log on. The Server Wizard starts to help you set up and configure any additional server components on the blade server.

Red Hat* Linux* 9.0 Server installation instructions

Complete the following steps to perform a basic installation of Red Hat Linux 9.0 Server.

- On the blade server on which you are installing the operating system, press the CD select button to associate that blade server with the CD, diskette, and USB port. Then, press the KVM select button to associate that blade server with the keyboard, monitor, and mouse.

- Insert the Red Hat Linux 9.0 Server CD into the CD-ROM drive. The blade server on which the installation will take place starts from the CD.

- Select "Okay" to test media. At least

  ### ⇒ NOTE
  NOTE: Do not switch the KVM from the blade server until the installation has proceeded to installing the packages after the About to Install window; otherwise, the mouse will lose functionality.

- Select "Graphical Mode" to begin

- Select "Okay" to test media. You must test at least one cd in order to proceed. If the media tests okay, proceed with the installation. select "Continue" to proceed.

  In the Welcome to Red Hat Linux Version 9.0 window, if you are using the SBXL52 blade server with SCSI hot-swap hard disk drives, load the Red Hat Linux 9.0 drvblock.img. The image may be obtained from your Intel support representative or may be obtained from the SBXL52 resource cd. Copy the image to a diskette and insert the diskette into the diskette drive when the "Devices" window is displayed.

- In the "Language Selection" window, select the languages in which you want to install the operating system, and click Next.

- In the "Set Root Password" window, type and confirm your root password. Use the root password only for administration. Enter the root password for the system and click "Next" when finished.

- In the "Package Group Selection" window, select the Graphical User Interface (GUI) of choice. Select the package (application) groups that you want to install. Select Kernel Development if you are planning to recompile kernels at a later time.

- In the "About to Install" window note the caution. **Caution: Once you click "Next" the installation program will begin. This process can not be undone. If you have decided not to continue with this installation, this is the last point at which you can safely abort the installation process.** Click "Next".

- In the "Installing Packages " window, Red Hat Linux 9.0 starts the installation process.

- In the "Boot Disk Creation " window, insert a boot diskette into your floppy drive and select "Yes". Click "Next" to create a boot diskette.

- After completion of the boot diskette, installation is complete. Click next to reboot the system.
- Log in as root user

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8 Service replaceable units

This chapter describes the removal of server components.

☞ **Important**

The field replaceable unit (FRU) procedures are intended for trained servicers who are familiar with Intel products. See the parts listing in "System" on page 104 to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU.

Microprocessor removal

☞ **NOTE**

- Read "Installation guidelines" on page 27.
- Read the safety notices at "Electrical Safety" on page vi.
- Read "Handling electrostatic discharge-sensitive devices" on page vi

Complete the following steps to remove a microprocessor:

1. Shut down the operating system, turn off the blade server, and remove the blade server from the SBCE unit (see "Removing the blade server from the SBCE unit" on page 33).
2. Carefully lay the blade server on a flat, non-conductive surface.
3. Open the blade server cover (see "Opening the blade server cover" on page 33 for instructions).
4. Remove the bezel assembly (see "Removing the blade server bezel assembly" on page 35 for instructions).
5. Identify the microprocessor to be removed.

   ☞ **NOTE**
   If you are replacing a failed microprocessor, verify that you have selected the correct microprocessor for replacement (see "Light path diagnostics" on page 81).

6. Remove the heat sink:
   a. Loosen one captive screw fully; then, loosen the other captive screw.
      Attention: Loosening one screw fully before loosening the other screw will help to break the thermal bond that adheres the heat sink to the microprocessor.
   b. Gently pull the heat sink off of the microprocessor.
7. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops or clicks in the fully open position (approximately 135° angle), as shown. Then, see the documentation provided with the microprocessor option for complete installation instructions.
   Attention: You must ensure that the locking lever on the microprocessor socket is in the fully open position before you insert the microprocessor in the socket. Failure to do so might result in permanent damage to the microprocessor, microprocessor socket, and system board.
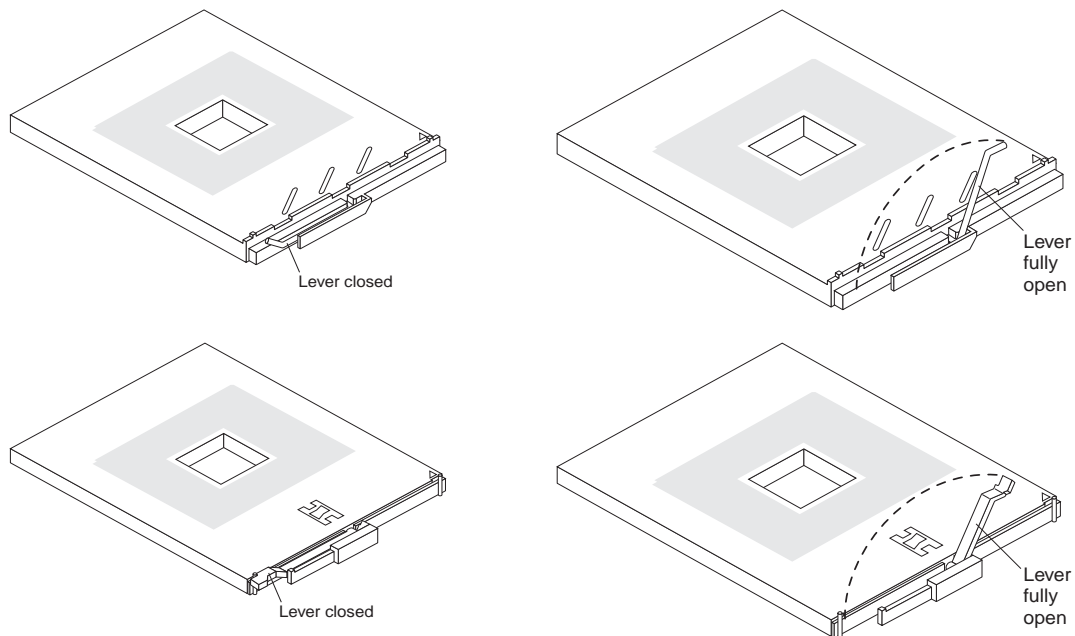
8. Pull the microprocessor out of the socket.
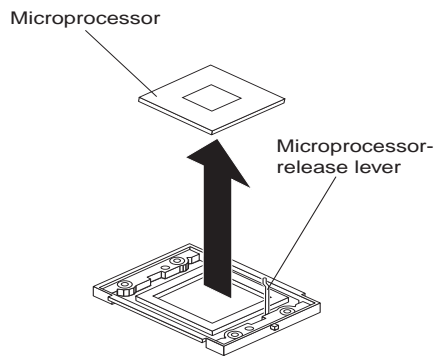
To install a microprocessor, see "Installing an additional microprocessor" on page 38

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

Thermal grease

This section contains information about removing and replacing the thermal grease between the heat sink and the microprocessor. The thermal grease must be replaced anytime the heat sink has been removed from the top of the microprocessor and is going to be reused, or when debris is found in the grease.

☞ **NOTE**

- Read "Installation guidelines" on page 27.
- Read the safety notices at "Electrical Safety" on page vi.
- Read "Handling electrostatic discharge-sensitive devices" on page vi

Complete the following steps to replace damaged or contaminated thermal grease on the microprocessor and heat sink:

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

   ⊸ **NOTE**
   Be sure that all of the thermal grease is removed.

4. Use a clean area of the cleaning pad to wipe the thermal grease from the microprocessor; then, dispose of the cleaning pad after all of the thermal grease is removed.
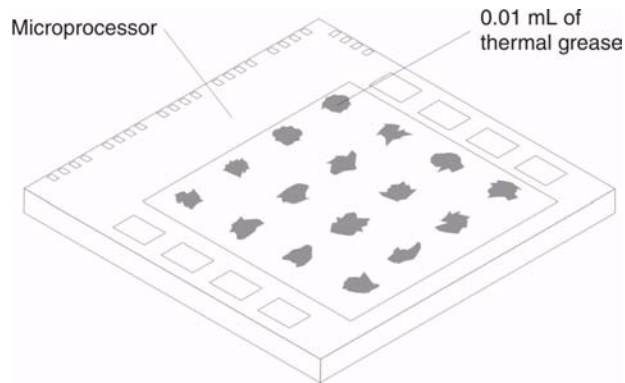
5. Use the thermal grease syringe to place 16 uniformly spaced dots of 0.01mL each on the top of the microprocessor.

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

6. Install the heat sink onto the microprocessor as described in "Installing an additional microprocessor" on page 38

System board

When replacing the system board, you must either update the system with the latest firmware or restore the pre-existing firmware that the customer provides on a diskette or CD image.
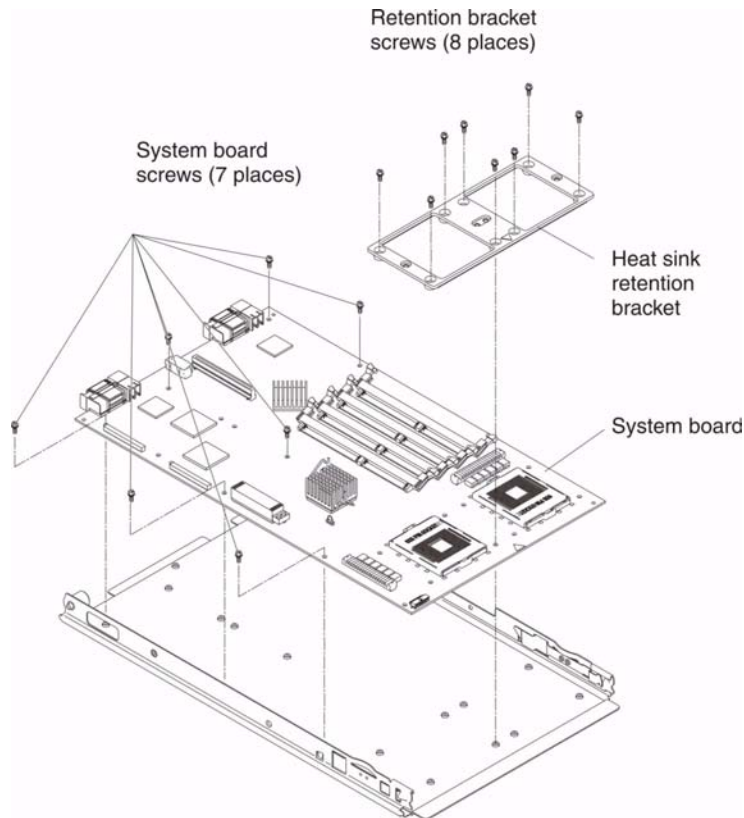
⊸ **NOTE**

- Read "Installation guidelines" on page 27
- Read the safety notices at "Electrical Safety" on page vi
- Read "Handling electrostatic discharge-sensitive devices" on page vi

Complete the following steps to remove the system board:

1. Shut down the operating system and turn off the blade server (see "Turning off the blade server" on page 5).
2. Remove the blade server from the SBCE chassis (see "Removing the blade server from the SBCE unit" on page 33).
3. Remove the blade server cover (see "Opening the blade server cover" on page 33) or SCSI storage expansion unit (see "Installing a SCSI storage expansion unit" on page 43).
4. Remove the blade server bezel assembly (see "Removing the blade server bezel assembly" on page 35).
5. Remove all components (see the appropriate installation instructions and reverse the steps) and place them on a static-protective surface for reinstallation.

   Notes:

   a. A microprocessor assembly ships with a new heat sink.
   b. A system board does not ship with a heat sink. When replacing the system board and re-installing an existing microprocessor, be sure to also re-install the heat sink (see "Thermal grease" on page 64).

6. Remove the eight screws that secure the heat sink retention bracket to the system board, and put the screws and the module in a safe place.

   Notes:

   a. Note the alignment of the heat sink retention bracket (the arrow on the bracket aligns with the arrow on the system board). You will need to align the bracket the same way when reinstalling it.

   b. One of the screws also helps secure the system board to the blade chassis.

7. Remove the other seven screws that secure the system board to the blade chassis, and put the screws in a safe place.

8. Pull the system board carefully out of the blade chassis.

Reverse these steps to install the replacement system board.

☞ **NOTE**

   Two self-adhesive labels ship with the system board. Apply one on top of the existing ethernet MAC address label located on the bottom of the blade chassis. The other label remains with the owner.

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9 Symptom-to-FRU index

This index supports the SBXL52 blade servers.

Notes:

1. Check the configuration before you replace a FRU. Configuration problems can cause false errors and symptoms.

2. For Intel devices not supported by this index, refer to the manual for that device.

3. Always start with "General checkout" on page 19

The symptom-to-FRU index lists symptoms, errors, and the possible causes. The most likely cause is listed first. Use this symptom-to-FRU index to help you decide which FRUs to have available when servicing the server.

The left-hand column of the tables in this index lists error codes or messages, and the right-hand column lists one or more suggested actions or FRUs to replace.

> ☞ **NOTE**
> In tables with more than two columns, multiple columns are required to describe the error symptoms.

Take the action (or replace the FRU) suggested first in the list of the right-hand column, then try the server again to see if the problem has been corrected before taking further action.

> ☞ **NOTE**
> Reseat a suspected component or reconnect a cable before replacing the component.

The POST BIOS code displays POST error codes and messages on the screen.

Beep symptoms

Beep symptoms are short tones or a series of short tones separated by pauses (intervals without sound). See the examples in the following table.

Beeps	Description
1-2-3	• One beep • A pause (or break) • Two beeps • A pause (or break) • Three beeps
4	Four continuous beeps

One beep after successfully completing POST indicates the system is functioning properly.

Beep/symptom	FRU/action
1-1-2 (Microprocessor register test failed)	1. **Optional microprocessor (if installed)** 2. Microprocessor 3. System board
1-1-3 (CMOS write/read test failed)	1. **Battery** 2. System board
1-1-4 (BIOS ROM checksum failed)	1. **Flash BIOS.** 2. DIMM. 3. System board.
1-2-1 (Programmable Interval Timer failed)	• **System board**
1-2-2 (DMA initialization failed)	• **System board**
1-2-3 (DMA page register write/read failed)	• **System board**
1-2-4 (RAM refresh verification failed)	1. **DIMM** 2. System board
1-3-1 (first 64K RAM test failed)	1. **DIMM** 2. System board
1-3-2 (first 64K RAM parity test failed)	1. **DIMM** 2. System board
2-1-1 (Secondary DMA register failed)	• **System board**
2-1-2 (Primary DMA register failed)	• **System board**
2-1-3 (Primary interrupt mask register failed)	• **System board**
2-1-4 (Secondary interrupt mask register failed)	• **System board**
2-2-1 (Interrupt vector loading failed)	• **System board**
2-2-2 (Keyboard controller failed)	1. **Keyboard** 2. System board 3. Management module

Beep/symptom	FRU/action
2-2-3 (CMOS power failure and checksum checks failed)	1. **Battery** 2. System board
2-2-4 (CMOS configuration information validation failed)	1. **Battery** 2. System board
2-3-1 (Screen initialization failed)	• **System board**
2-3-2 (Screen memory failed)	• **System board**
2-3-3 (Screen retrace failed)	• **System board**
2-3-4 (Search for video ROM failed)	• **System board**
2-4-1 (Video failed; screen believed operable)	• **System board**
3-1-1 (Timer tick interrupt failed)	• **System board**
3-1-2 (Interval timer channel 2 failed)	• **System board**
3-1-3 (RAM test failed above address OFFFFH))	1. **DIMM** 2. System board
3-1-4 (Time-Of-Day clock failed)	1. **Battery** 2. System board
3-2-1 (Serial port failed)	• **System board**
3-2-2 (Parallel port failed)	• **System board**
3-2-3 (Math coprocessor test failed)	1. **Microprocessor** 2. System board
3-2-4 (Failure comparing CMOS memory size against actual)	1. **DIMM** 2. System board 3. Battery
3-3-1 (Memory size mismatch occurred.)	1. **Verify that both DIMMs in bank are of the same size, speed, type and technology.** 2. DIMM 3. System board 4. Battery

<table>
<tr><td colspan="2">

➖ **NOTE**

    See "**System" on page 104** to determine which components should be replaced by a field service technician.
</td></tr>
<tr><td>**Beep/symptom**</td><td>**FRU/action**</td></tr>
<tr>
<td>

3-3-2
(Critical SMBUS error occurred)
</td>
<td>

1. **Power down blade server and reseat it in chassis.**
2. DIMMs.
3. System board.
</td>
</tr>
<tr>
<td>

3-3-3
(No operational memory in system)

➖ **NOTE**

    In some memory configurations, the 3-3-3 beep code might sound during POST followed by a blank display screen. If this occurs and the **Boot Fail Count** feature in the **Start Options** of the Configuration/Setup Utility is set to **Enabled** (its default setting), you must restart the server three times to force the system BIOS code to reset the memory connector or bank of connectors from **Disabled** to **Enabled**.
</td>
<td>

1. **Install or reseat the memory modules, and then do a 3 boot reset.** (For more information on a 3 boot reset, see "Using the Configuration/Setup Utility program" on page 11)
2. DIMMs.
3. System board.
</td>
</tr>
<tr>
<td>

Two short beeps
(Information only, the configuration has changed)
</td>
<td>

1. **Run Diagnostics.**
2. Run the Configuration/Setup Utility program.
</td>
</tr>
<tr>
<td>**Three short beeps**</td>
<td>

1. **DIMM**
2. System board
</td>
</tr>
<tr>
<td>**One continuous beep**</td>
<td>

1. **Microprocessor**
2. Optional microprocessor (if installed)
3. System board
</td>
</tr>
<tr>
<td>**Repeating short beeps**</td>
<td>

1. **Keyboard**
2. System board
</td>
</tr>
</table>

No-beep symptoms

<table>
<tr><td colspan="2">✑ NOTE
See "System" on page 104 to determine which components should be replaced by a field service technician.</td></tr>
<tr><td>No-beep symptom</td><td>FRU/action</td></tr>
<tr><td>No beep and the system operates correctly.</td><td>• System board</td></tr>
<tr><td>No beep and no video (System error LED is OFF)</td><td>• See "Undetermined problems" on page 100.</td></tr>
<tr><td>No beep and no video (System Attention LED is ON)</td><td>• See "Identifying problems using the light path diagnostics" on page 24</td></tr>
</table>

Diagnostic error codes

✑ **NOTE**

In the following error codes, if *XXX* is *000*, *195*, or *197*, *do not* replace a FRU. The description for these error codes are:

000   The test passed.

195   The Esc key was pressed to stop the test.

197   Warning; a hardware failure might not have occurred.

 For all error codes, replace the FRU or take the action indicated.

<table>
<tr><td colspan="2">✑ NOTE
See "System" on page 104 to determine which components should be replaced by a field service technician.</td></tr>
<tr><td>Error code/symptom</td><td>FRU/action</td></tr>
<tr><td>001-250-000
(Failed system board ECC)</td><td>• System board</td></tr>
<tr><td>001-250-001
(Failed processor board ECC)</td><td>• System board</td></tr>
<tr><td>001-292-000 (Core system: failed/CMOS checksum failed)</td><td>• Load BIOS defaults and rerun test.</td></tr>
<tr><td>001-XXX-000
(Failed core tests)</td><td>• System board</td></tr>
<tr><td>001-XXX-001
(Failed core tests)</td><td>• System board</td></tr>
<tr><td>005-XXX-000
(Failed video test)</td><td>• System board</td></tr>
</table>

> **⊟ NOTE**
>> See "System" on page 104 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
030-XXX-000 (Failed internal SCSI interface test)	1. **SCSI storage expansion unit** 2. System board
035-XXX-099	1. **No adapters were found.** 2. If adapter is installed re-check connection.
075-XXX-000 (Failed power supply test)	• **Power supply**
089-XXX-001 (Failed microprocessor test)	1. **Microprocessor 1** 2. System board
089-XXX-002 (Failed optional microprocessor test)	1. Optional microprocessor 2 2. System board
165-060-000 (Service Processor: ASM may be busy)	1. **Rerun the diagnostic test.** 2. Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel. 3. Power down blade server and reseat it in chassis. 4. System board.
165-198-000 (Service Processor: Aborted)	1. **Rerun the diagnostic test** 2. Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel. 3. Power down blade server and reseat it in chassis. 4. System board.
165-201-000 (Service Processor: Failed)	1. **Power down blade server and reseat it in chassis.** 2. System board.
165-330-000 (Service Processor: Failed)	• Update to the latest ROM diagnostic level and retry.
165-342-000 (Service Processor: Failed)	1. Ensure latest firmware levels for ASM and BIOS are installed. 2. Power down blade server and reseat it in chassis. 3. System board.
166-198-000 System Management: Aborted (Unable to communicate with ASM. It may be busy. Run the test again.)	1. **Run the diagnostic test again.** 2. Correct other error conditions and retry. These include other failed system management tests and items logged in the System Error Log of the management module. 3. Power down blade server and reseat it in chassis. 4. System board.
166-201-001 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	1. **DIMMs** 2. System board
166-201-002 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	1. **Reseat I2C cable between the operator information card and the system board.** 2. Operator information card. 3. System board.

Error code/symptom	FRU/action
166-201-003 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	1. **I/O adapter** 2. System board
166-201-004 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	1. **SCSI storage expansion unit** 2. System board
166-201-005 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	1. **DIMMs** 2. Microprocessors 3. System board
166-342-000 System Management: Failed (ASM adapter BIST indicate failed tests.)	1. **Ensure the latest firmware levels for Remote Supervisor Adapter and BIOS are installed.** 2. Power down blade server and reseat it in chassis. 3. Remote Supervisor Adapter.
166-400-000 System Management: Failed (ISMP self test result failed tests: *x* where *x* = Flash, RAM, or ROM.)	1. **Reflash or update firmware for ISMP.** 2. System board.
180-XXX-000 (Diagnostics LED failure)	• **Run diagnostics panel LED test for the failing LED.**
180-XXX-001 (Failed front LED panel test)	1. **Front bezel with customer interface card** 2. System board
180-XXX-002 (Failed diagnostics LED panel test)	• **System board**
180-XXX-003 (Failed system board LED test)	• **System board**
180-XXX-005 (Failed SCSI backplane LED test)	1. **SCSI storage expansion unit** 2. System board

201-XXX-0nn (Failed memory test.)	1. **DIMM Location slots 1-4 where *nn* = DIMM location.**
	
	    ⚊ **NOTE**
	        nn 1=DIMM 1; 2=DIMM 2; 3=DIMM 3; 4=DIMM 4.
	2. System board.

201-XXX-999 (Multiple DIMM failure, see error text)	1. **See error text for failing DIMMs.** 2. System board.
202-XXX-001 (Failed system cache test)	1. **Microprocessor 1** 2. System board
202-XXX-002 (Failed system cache test)	1. **Microprocessor 2** 2. System board
217-198-XXX (Could not establish drive parameters)	• **SCSI storage expansion unit**

Error code/symptom	FRU/action
217-XXX-000 (Failed hard disk drive test) *☞ **NOTE** If RAID is configured, the hard disk drive number refers to the RAID logical array.	• **Hard disk drive 1**
217-XXX-001 (Failed hard disk test) *☞ **NOTE** If RAID is configured, the hard disk number refers to the RAID logical array.	• **Hard disk drive 2**
405-XXX-000 (Failed Ethernet test on controller on the system board)	1. **Verify that Ethernet is not disabled in BIOS.** 2. System board.

POST error codes

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

Error code/symptom	FRU/action
062 (Three consecutive startup failures using the default configuration.)	1. **Run the Configuration/Setup Utility program.** 2. Battery. 3. System board. 4. Microprocessor.
101, 102 (System and processor error)	• **System board**
106 (System and processor error)	• **System board**
111 (Channel check error)	1. **Failing adapter** 2. DIMM 3. System board
114 (Adapter read-only memory error)	1. **Failing adapter.** 2. Run diagnostics.

Error code/symptom	FRU/action
151 (Real time clock error)	1. **Run diagnostics.** 2. Battery. 3. System board.
161 (Real time clock battery error)	1. **Run the Configuration/Setup Utility program.** 2. Battery. 3. System board.

162
(Device configuration error)
 	
= **NOTE**
    Be sure to load the default settings and any additional desired settings; then, *save the configuration*.
	1. **Run the Configuration/Setup Utility program.**
	
	= **NOTE**
	    If unable to enter Configuration/Setup Utility program, view system event log in SBCE management module.
	2. Battery.
	3. Failing device.
	4. System board.

163 (Real-time clock error)	1. **Run the Configuration/Setup Utility program.** 2. Battery. 3. System board.
164 (Memory configuration changed.)	1. **Run the Configuration/Setup Utility program.** 2. DIMM. 3. System board.
165 (Service Processor failure)	• **System board**
184 (Power-on password damaged)	1. **Run the Configuration/Setup Utility program.** 2. System board.
185 (Drive startup sequence information corrupted)	1. **Run the Configuration/Setup Utility program.** 2. System board.
189 (An attempt was made to access the server with invalid passwords)	• **Run the Configuration/Setup Utility program, and enter the administrator password.**
201 (Memory test error.) If the server does not have the latest level of BIOS installed, update the BIOS to the latest level and run the diagnostic program again.	1. **DIMM** 2. System board
229 (Cache error)	1. **Microprocessor** 2. Optional microprocessor (if installed)
262 (DRAM parity configuration error)	1. **Run the Configuration/Setup Utility program.** 2. Battery. 3. System board.

>   See "System" on page 104 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
289 (DIMM disabled by POST or user)	1. **Run the Configuration/Setup Utility program, if the DIMM was disabled by the user.** 2. Disabled DIMM, if not disabled by user. 3. System board
301 (Keyboard or keyboard controller error)	1. **Keyboard** 2. System board
303 (Keyboard controller error)	• **System board**
602 (Invalid diskette boot record)	1. **Diskette** 2. Diskette drive 3. Cable 4. System board
604 (Diskette drive error)	1. **Run the Configuration/Setup Utility program and diagnostics.** 2. Diskette drive. 3. Drive cable. 4. System board.
605 (Unlock failure)	1. **Diskette drive** 2. Drive cable 3. System board
662 (Diskette drive configuration error)	1. **Run the Configuration/Setup Utility program and diagnostics.** 2. Diskette drive. 3. Drive cable. 4. System board.
762 (Coprocessor configuration error)	1. **Run the Configuration/Setup Utility program.** 2. Battery. 3. Microprocessor.
962 (Parallel port configuration error)	1. **Run the Configuration/Setup Utility program and verify that the parallel-port setting is correct.** 2. System board.
11XX (System board serial port 1 or 2 error)	1. **Disconnect the external cable on the serial port.** 2. Run the Configuration/Setup Utility program. 3. System board.
1162 (Serial port configuration conflicts)	1. **Run the Configuration/Setup Utility program** and ensure that the IRQ and I/O port assignments needed by the serial port are available. 2. If all interrupts are being used by adapters, remove an adapter or force other adapters to share an interrupt.

Error code/symptom	FRU/action
1301 (I2C cable to operator information panel not found)	1. **Cable** 2. Operator information card 3. Power switch assembly 4. System board
1302 (I2C cable from system board to power-on and reset switches not found)	1. **Cable** 2. Power switch assembly 3. System board
1303 (I2C cable from system board to power backplane not found)	1. **Cable** 2. Power supply 3. System board
1304 (I2C cable to diagnostic LED board not found)	1. **Power switch assembly** 2. System board
1762 (Hard disk configuration error)	1. **Hard disk drive.** 2. Hard disk drive cables. 3. Run the Configuration/Setup Utility program. 4. SCSI storage expansion unit. 5. System board.
178X (Fixed disk error)	1. **Hard disk drive cables.** 2. Run diagnostics. 3. Hard disk drive. 4. System board.
1800 (No more hardware interrupt available for PCI adapter)	1. **Run Configuration/Setup to verify that the interrupt resource settings are correct.** 2. Failing adapter (if installed). 3. System board.
1962 (Drive does not contain a valid boot sector)	1. **Verify that a startable operating system is installed.** 2. Run diagnostics. 3. Hard disk drive. 4. SCSI storage expansion unit. 5. System board.
2400 (Video controller test failure)	1. **Verify that the keyboard/mouse/video select button LED on the front of the blade server is on, indicating that the blade server is connected to the shared SBCE monitor.** 2. Verify that the monitor is connected correctly to the SBCE unit. 3. Video adapter (if installed). 4. System board.

Error code/symptom	FRU/action
2462 (Video memory configuration error)	1. **Verify that the keyboard/mouse/video select button LED on the front of the blade server is on, indicating that the blade server is connected to the shared SBCE monitor.** 2. Verify that the monitor is connected correctly to the SBCE unit. 3. Video adapter (if installed). 4. System board.
5962 (IDE CD-ROM drive configuration error)	1. **Run the Configuration/Setup Utility program.** 2. CD-ROM drive. 3. CD-ROM power cable. 4. IDE cable. 5. System board. 6. Battery.
8603 (Pointing-device error)	1. **Pointing device** 2. System board
0001200 (Machine check architecture error)	1. **Microprocessor 1** 2. Optional microprocessor 2 3. System board
00012000 (Microprocessor machine check)	1. **Microprocessor** 2. System board
00019501 (Microprocessor 1 is not functioning - check VRM and microprocessor LEDs)	1. **Microprocessor 1** 2. System board
00019502 (Microprocessor 2 is not functioning – check VRM and microprocessor LEDs)	1. **Microprocessor 2** 2. System board
00019701 (Microprocessor 1 failed)	1. **Microprocessor 1** 2. System board
00019702 (Microprocessor 2 failed)	1. **Microprocessor 2** 2. System board
00151200 (microprocessor machine check)	1. **Run the Configuration/Setup Utility program.** 2. Microprocessor (check error LED for failing microprocessor). 3. System board.
00180200 (No more I/O space available for adapter)	1. **Run the Configuration/Setup Utility program.** 2. Failing adapter. 3. System board.
01295085 (ECC checking hardware test error)	1. **System board** 2. Microprocessor

— **NOTE**	
See "System" on page 104 to determine which components should be replaced by a field service technician.	

Error code/symptom	FRU/action
01298001 (System BIOS installed on this server does not support level of processor)	1. **Ensure all microprocessors have the same cache size.** 2. Microprocessor 1.
01298002 (System BIOS installed on this server does not support level of processor)	1. **Ensure all microprocessors have the same cache size.** 2. Microprocessor 2.
01298101 (System BIOS installed on this server does not support level of processor)	1. **Ensure all microprocessors have the same cache size.** 2. Microprocessor 1.
01298102 (System BIOS installed on this server does not support level of processor)	1. **Ensure all microprocessors have the same cache size.** 2. Microprocessor 2.
01298200 (Microprocessor speed mismatch)	1. **Ensure all microprocessors are the same speed.** 2. Microprocessor.
I9990301 (Hard disk sector error)	1. **Hard disk drive** 2. SCSI backplane 3. Cable 4. System board
I9990305 (Hard disk sector error, no operating system installed)	• **Install operating system to hard disk.**
I9990650 (AC power has been restored)	1. **Check cable.** 2. Check for interruption of power. 3. Power cable.

Light path diagnostics

Lit blade-error LED	Cause	Action
None	An error has occurred and cannot be isolated, or the service processor has failed.	• An error has occurred that is not represented by a Light Path Diagnostics LED. Check the system error log for more information about the error.

Lit blade-error LED	Cause	Action
DIMM x error	A memory error occurred.	1. Reseat the DIMM indicated by the lit DIMM failure LED. 2. Replace the DIMM. — **NOTE** Multiple DIMM LEDs do not necessarily indicate multiple DIMM failures. If more than one DIMM LED is on, reseat/replace one DIMM at a time until error goes away. Refer to the SBCE management module system error log for further isolation.
Processor x error	The microprocessor has failed.	1. Verify that the microprocessor indicated by the lit LED is installed correctly. (See "Installing an additional microprocessor" on page 38 for installation instructions). 2. Replace the microprocessor.
Temperature error	The system temperature has exceeded a threshold level.	1. Check to see if a blower on the SBCE unit has failed. If it has, replace the fan. 2. Make sure the room temperature is not too high. (See "Features and specifications" on page 2 for temperature information.)
System board error	The system board has failed	1. Replace the blade server cover, reinsert the blade server in the SBCE unit, and then restart the server. 2. Replace the system board.
IDE bus x error	The IDE bus indicated by the error LED has failed.	1. Reseat/replace the hard disk drive on IDE bus *x*. 2. Replace the system board.
NMI error	The system board has failed.	1. Replace the blade server cover, reinsert the blade server in the SBCE unit, and then restart the blade server. 2. Check the system error log for information about the error. If the problem remains, replace the system board.
Processor mismatch	The processors do not match.	• Verify that microprocessors 1 and 2 have the same cache size and type and the same clock speed. Internal and external clock frequencies must be identical; also see "Error symptoms" on page 83.

IDE RAID

```
─ NOTE
      See "System" on page 104 to determine which components should be replaced by a field service
      technician.
```

Error symptom	FRU/action

Drives are not detected	1. **Verify that drives are installed correctly:**
	   a. Cables should be of type Ultra ATA-100 or ATA-133 and should be installed correctly.
	   b. Power cables to drives should be connected properly.
	2. Cables.
	3. Drive.

System hangs when MegaRAID IDEal Software CSB6 RAID adapter ROM scans the IDE channels	1. **Verify that drives are installed correctly:**
	   a. Cables should be of type Ultra ATA-100 or ATA-133 and should be installed correctly.
	   b. Power cables to drives should be connected properly.
	2. Cables.
	3. Drive.

BIOS reports that a mirrored array is in degraded mode	1. **Verify that all physical drives are:**
	   a. Installed correctly
	   b. Powered on
	2. Reconnect, replace, or rebuild any failed drive.

One of the hard disk drives in a mirrored array has failed	1. **Verify that drives are installed correctly.** 2. Replace drive with another drive of the same capacity.
"NO ROM BASIC SYSTEM HALTED" message displays during startup (There are no active partitions)	1. **Verify that drives are installed correctly.** 2. Run FDISK to set active partition.
Operating system does not boot	1. **Check system BIOS configuration for PCI interrupt assignments and verify that some interrupts are assigned for PCI.** 2. Verify that the boot device in system BIOS setup (CMOS setup) is selected correctly.

Error symptoms

You can use the error symptom table to find solutions to problems that have definite symptoms.

If you cannot find the problem in the error symptom charts, go to "Starting the diagnostic programs" on page 22 to test the server.

If you have just added new software or a new option and your server is not working, do the following before using the error symptom charts:

• Remove the software or device that you just added.

• Run the diagnostic tests to determine if your server is running correctly.

- Reinstall the new software or new device.

In the following table, if the entry in the FRU/action column is a suggested action, perform that action; if it is the name of a component, reseat the component and replace it if necessary. The most likely cause of the symptom is listed first.

NOTE
See "System" on page 104 to determine which components should be replaced by a field service technician.

CD-ROM drive problems

Symptom	FRU/action

CD-ROM drive is not recognized.	1. **Verify that:**
	    • All cables and jumpers are installed correctly.
	    • The correct device driver is installed for the CD-ROM drive.
	2. Run CD-ROM drive diagnostics.
	3. CD-ROM drive.

CD is not working properly.	1. **Clean the CD.** 2. Run CD-ROM drive diagnostics. 3. CD-ROM drive.
CD-ROM drive tray is not working. (The computer must be turned on.)	1. **Insert the end of a straightened paper clip into the manual tray-release opening.** 2. Run CD-ROM drive diagnostics. 3. CD-ROM drive.

CD-ROM drive is not recognized after being switched back to blade server running Windows 2000 Advanced Server with SP3 applied. (When the CD-ROM drive is owned by blade server x, is switched to another blade server, then is switched back to blade server x, the operating system in blade server x no longer recognizes the CD-ROM drive. This happens when you have not safely stopped the drives before switching ownership of the CD-ROM drive, diskette drive, and USB port (media tray).	**NOTE**
	    Because the SBCE unit uses a USB bus to communicate with the media tray devices, switching ownership of the media tray to another blade server is the same as unplugging a USB device.
	
	• Before switching ownership of the CD-ROM drive (media tray) to another blade server, safely stop the media tray devices on the blade server that currently owns the media tray, as follows:
	    1. Double-click the Unplug or Eject Hardware icon in the Windows taskbar at the bottom right of the screen.
	    2. Select USB Floppy and click Stop.
	    3. Select USB Mass Storage Device and click Stop.
	    4. Click Close.
	
	You can now safely switch ownership of the media tray to another blade server.

<table>
<tr><td colspan="2">
NOTE

See "System" on page 104 to determine which components should be replaced by a field service technician.
</td></tr>
<tr><td colspan="2">Diskette drive problems</td></tr>
<tr><td>Symptom</td><td>FRU/action</td></tr>
<tr><td>Diskette drive activity LED stays on, or the system bypasses the diskette drive.</td><td>

1. **If there is a diskette in the drive, verify that:**

   - The diskette is inserted correctly in the drive.
   - The diskette is good and not damaged.   (Try another diskette if you have one.)

     — The drive light comes on (one-second flash) when the diskette is inserted.
   - The diskette contains the necessary files to start the computer.
   - The diskette drive is enabled in the Configuration/Setup utility program.
   - The software program is working properly.
   - The cable is installed correctly (in the proper orientation).

2. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.).

3. Cable.

4. Run diskette drive diagnostics.

5. Diskette drive.

6. Media tray card.
</td></tr>
</table>

<table>
<tr><td colspan="2">
NOTE

See "System" on page 104 to determine which components should be replaced by a field service technician.
</td></tr>
<tr><td colspan="2">Expansion enclosure problems</td></tr>
<tr><td>Symptom</td><td>FRU/action</td></tr>
<tr><td>The SCSI storage expansion unit used to work but does not work now.</td><td>

1. **Verify that the enclosure is installed correctly.**
2. For more information, see your SCSI storage expansion unit documentation.
</td></tr>
</table>

<table>
<tr><td colspan="2">
NOTE

See "System" on page 104 to determine which components should be replaced by a field service technician.
</td></tr>
<tr><td colspan="2">Hard disk drive problems</td></tr>
<tr><td>Symptom</td><td>FRU/action</td></tr>
<tr><td>Not all drives are recognized by the hard disk drive diagnostic test (Fixed Disk test).</td><td>

1. **Remove the first drive not recognized and try the hard disk drive diagnostic test again.**
2. If the remaining drives are recognized, replace the drive you removed with a new one.
</td></tr>
</table>

⊸ **NOTE**	
See "System" on page 104 to determine which components should be replaced by a field service technician.	
Hard disk drive problems	
Symptom	**FRU/action**
System stops responding during hard disk drive diagnostic test.	1. **Remove the hard disk drive being tested when the computer stopped responding and try the diagnostic test again.** 2. If the hard disk drive diagnostic test runs successfully, replace the drive you removed with a new one.

⊸ **NOTE**	
See "System" on page 104 to determine which components should be replaced by a field service technician.	
General problems	
Symptom	**FRU/action**
Problems such as broken cover locks or indicator LEDs not working	• **Broken CRU/FRU**

⊸ **NOTE**	
See "System" on page 104 to determine which components should be replaced by a field service technician.	
Intermittent problems	
Symptom	**FRU/action**
A problem occurs only occasionally and is difficult to detect.	• **Verify that:** — When the computer is turned on, air is flowing from the rear of the computer at the blower grill. If there is no airflow, the blower is not working. This causes the computer to overheat and shut down. — Ensure that the SCSI bus and devices are configured correctly.

NOTE	
See "System" on page 104 to determine which components should be replaced by a field service technician.	

Keyboard, mouse, or pointing-device problems	
Symptom	**FRU/action**
All or some keys on the keyboard do not work.	1. **Verify that:** • The keyboard cable is securely connected to the SBCE management module, and the keyboard and mouse cables are not reversed. • Both the computer and the monitor are turned on. 2. Keyboard. 3. Management module on the SBCE unit; see the Intel Server System SBCE *Hardware Maintenance Manual and Troubleshooting Guide* on the *SBCE Documentation* CD.
The mouse or pointing device does not work.	1. **Verify that:** • The keyboard/mouse/video select button LED on the front of the blade server is lit, indicating that the blade server is connected to the shared SBCE monitor. • The mouse or pointing-device cable is securely connected to the SBCE management module, and that the keyboard and mouse cables are not reversed. • The mouse works correctly with other blade servers. • The mouse device drivers are installed correctly. • Both the computer and the monitor are turned on. • The mouse is recognized as a USB device, not PS2, by your blade server. Although the mouse is a PS2-style device, communication with the mouse is through an internal USB bus in the SBCE chassis. Some operating systems permit you to select the type of mouse during installation of the operating system. Select USB. 2. Mouse or pointing device. 3. Management module on the SBCE unit; see the Intel Server System *SBCE Hardware Maintenance Manual and Troubleshooting Guide* on the Intel *SBCE Documentation* CD.
Mouse function lost during Red Hat installation.	• If, while installing Red Hat Linux 7.3 to a blade server, you or someone else selects a different blade server as owner of the keyboard, video, and monitor (KVM), you might lose mouse function for the installation process. Do not switch KVM owners until the installation process begins to install the packages (after the 'About to Install' window).

Memory problems

Symptom	FRU/action

The amount of system memory displayed is less than the amount of physical memory installed.	1. **Verify that:**
	
	• The memory modules are seated properly.
	• You have installed the correct type of memory.
	• If you changed the memory, you updated the memory configuration with the Configuration/Setup Utility program.
	• All banks of memory on the DIMMs are enabled. The computer might have automatically disabled a DIMM bank when it detected a problem or a DIMM bank could have been manually disabled.
	
	2. Check POST error log for error message 289:
	
	• If the DIMM was disabled by a system-management interrupt (SMI), replace the DIMM.
	
	• If the DIMM was disabled by the user or by POST:
	
	   a. Start the Configuration/Setup Utility program.
	   b. Enable the DIMM.
	   c. Save the configuration and restart the computer.
	
	3. DIMM.
	4. System board.

Microprocessor problems

Symptom	FRU/action
The blade server emits a continuous tone during POST. (The startup (boot) microprocessor is not working properly.)	1. **Verify that the startup microprocessor is seated properly.** 2. Startup microprocessor.

<table><tr><td colspan="2">☞ **NOTE** See "System" on page 104 to determine which components should be replaced by a field service technician.</td></tr></table>	

Monitor problems

Symptom	FRU/action
Testing the monitor.	• **See the information that comes with the monitor** for adjusting and testing instructions.

The screen is blank.	1. **Verify that:**
	
	    • The keyboard/mouse/video select button LED on the front of the blade server is lit, indicating that the blade server is connected to the shared SBCE monitor.
	    • The system power cord is plugged into the SBCE power module and a working electrical outlet.
	    • The monitor cables are connected properly.
	    • The monitor is turned on and the Brightness and Contrast controls are adjusted correctly.
	    • If the computers are C2T chained together, verify that:
	      — The C2T chain cables are securely connected to the computers.
	      — The C2T breakout cable is connected properly.
	      — A computer that is turned on is selected.
	
	☞ **Important**
	
	☞ In some memory configurations, the 3-3-3 beep code might sound during POST followed by a blank display screen. If this occurs and the **Boot Fail Count** feature in the Start Options of the Configuration/Setup Utility program is set to **Enabled** (its default setting), you must restart the computer three times to force the system BIOS to reset the CMOS values to the default configuration (memory connector or bank of connectors enabled).
	
	2. If you have verified these items and the screen remains blank, replace:
	
	  a. Monitor
	
	  b. Management module on the SBCE (see the *SBCE Hardware Maintenance Manual and Troubleshooting Guide*).

Only the cursor appears.	• **Verify that** the keyboard, video and mouse on the SBCE have not been switched to another blade server. If the problem remains, see"Undetermined problems" on page 100.
The monitor goes blank when you direct it to a working blade server, or goes blank when you start some application programs in the blade servers.	• **Verify that** the monitor cable is connected to the video port on the SBCE management module. Some monitors have their own self-tests. If you suspect a problem with your monitor, see the information that comes with the monitor for adjusting and testing instructions. If you still cannot find the problem, try using the monitor with another blade server. If the problem persists, see the Intel Server System SBCE *Hardware Maintenance Manual and Troubleshooting Guide* on the *Documentation* CD.

Monitor problems

Symptom	FRU/action
The screen is wavy, unreadable, rolling, distorted, or has screen jitter.	1. **If the monitor self-tests show the monitor is working properly, consider the location of the monitor.** Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. (Moving a color monitor while it is turned on might cause screen discoloration.) Then move the device and the monitor at least 305 mm (12 in.) apart. Turn on the monitor. **Notes:** a. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.). b. monitor cables might cause unpredictable problems. 2. Monitor. 3. System board.
Wrong characters appear on the screen.	1. If the wrong language is displayed, update the firmware or operating system with the correct language in the blade server that has ownership of the monitor. 2. Monitor. 3. System board.
No video.	1. **Make sure the correct machine is selected, if applicable.** 2. Make sure all cables are locked down.

NOTE	
See "System" on page 104 to determine which components should be replaced by a field service technician.	

Option problems	
Symptom	**FRU/action**

An Intel option that was just installed does not work.	1. **Verify that:**
	
	• You followed the installation instructions that came with the option.
	• The option is installed correctly.
	• You have not loosened any other installed options or cables and that all option hardware and cable connections are secure.
	• If the failing option is a SCSI storage expansion unit:
	   — The cables for the SCSI expansion unit are connected correctly.
	   — If the SCSI storage expansion unit has been removed, verify that the socket is terminated correctly.
	   — The external SCSI expansion unit is turned on. You must turn on the external SCSI expansion unit before turning on the computer.
	• You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration.
	
	2. If the option comes with its own test instructions, use those instructions to test the option.
	
	3. Replace the option you just installed.

NOTE	
See "System" on page 104 to determine which components should be replaced by a field service technician.	

Power problems	
Symptom	**FRU/action**
Power switch does not work and reset button, if supported, does work.	1. **Reseat connector.** 2. Front bezel with customer card. 3. System board.

NOTE	
See "System" on page 104 to determine which components should be replaced by a field service technician.	

Power problems

Symptom	FRU/action

The blade server does not turn on.	1. **Verify that:**
	
	  a. The power LED on the front of the SBCE unit is on.
	  b. The LEDs on all the SBCE power modules are on.
	  c. If the blade server or attached storage expansion unit is in blade bay 7-14, power modules are in power bays 1, 2, 3 and 4.
	  d. The power-on LED on the blade server control panel is blinking slowly.
	
	    • If the power LED is blinking rapidly and continues to do so, the blade server is not communicating with the management module; reseat the blade server, then go to step 3
	
	    • If the power LED is off, the blade bay is not receiving power, the blade server is defective, or the LED information panel is loose or defective.
	  e. Local power control for the blade server is enabled (use the SBCE management module Web interface to verify), or the blade server was instructed through the management module (Web interface) to turn on.
	
	2. If you just installed an option in the blade server, remove it, and restart the blade server. If the blade server now turns on, you may have installed more options than the power to that blade bay supports.
	
	3. Try another blade server in the blade bay; if it works, replace the faulty blade server.
	
	4. See "Undetermined problems" on page 100.

The blade server does not turn on and the following conditions are present: 1. The amber system error LED on the Blade Center unit's system LED panel is lit; 2. The amber blade error LED on the blade server's LED panel is lit; and 3. The system error log contains the message "CPUs mismatched".	• The microprocessor with the lowest feature set must be used as the Bootstrap Processor (microprocessor 1 in location U66; see "System board illustration" on page 29). Move the microprocessor in location U66 to location U70, and move the microprocessor in location U70 to location U66.
The blade server turns off for no apparent reason	1. **Verify that all blade bays have a blade server, expansion unit, or filler blade properly installed.** If these components are missing or improperly installed, an over-temperature condition may result in shutdown. 2. If microprocessor LED is illuminated, replace the microprocessor.

– **NOTE**
See "System" on page 104 to determine which components should be replaced by a field service technician.

Power problems	
Symptom	**FRU/action**

The computer does not turn off.	1. **Verify whether you are using an ACPI or non-ACPI operating system.** If you are using a non-ACPI operating system:
	
	  a. Press Ctrl+Alt+Delete.
	
	  b. Turn off the system by holding the power-control button for 4 seconds.
	
	  c. If computer fails during BIOS POST and power-control button does not work, remove the blade server from the bay and reseat it.
	
	2. If the problem remains or if you are using an ACPI-aware operating system, suspect the system board.

– **NOTE**
See "System" on page 104 to determine which components should be replaced by a field service technician.

Software problem	
Symptom	**FRU/action**

Suspected software problem.	1. **To determine if problems are caused by the software, verify that:**
	
	  • The computer has the minimum memory 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, you might have a memory address conflict.
	  • The software is designed to operate on the computer.
	  • Other software works on the computer.
	  • The software that you are using works on another system.
	
	  If you received any error messages when using the software program, see the information that comes with the software for a description of the messages and suggested solutions to the problem.
	
	2. If you have verified these items and the problem remains, contact your place of purchase.

> **NOTE**
>
> See "System" on page 104 to determine which components should be replaced by a field service technician.

Universal Serial Bus (USB) port problems

Symptom	FRU/action
A USB device does not work.	• **Verify that:** — The correct USB device driver is installed. — The operating system supports USB devices.

> **NOTE**
>
> See "System" on page 104 to determine which components should be replaced by a field service technician.

Network connection problems

Symptom	FRU/action
One or more blade servers are unable to communicate with the network.	**Verify that:** • The switch modules for the network interface being used are installed in the correct SBCE bays and are configured and operating correctly. See the Intel Server System SBCE *Hardware Maintenance Manual and Troubleshooting Guide* on the Resource CD for details. • The settings in the switch module are appropriate for the blade server (settings in the switch module are blade-specific). If you installed an I/O expansion option, verify that: • The option is designed for the blade server. • You followed the installation instructions that came with the option. • The option is installed correctly. • You have not loosened any other installed options or cables. • You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration. If the problem remains, see "Undetermined problems" on page 100.

NOTE	
See "System" on page 104 to determine which components should be replaced by a field service technician.	

Service processor problems	
Symptom	**FRU/action**
Service processor in the management module reports a general monitor failure.	• Disconnect the SBCE unit from all electrical sources, wait for 30 seconds, reconnect the SBCE unit to the electrical sources, and restart the server. If the problem remains, see "Undetermined problems" on page 100 and the Intel Server System SBCE *Hardware Maintenance Manual and Troubleshooting Guide* on the Resource CD

Service processor error codes

NOTE
These codes are viewed in the SBCE management module log.

When viewed from POST, service processor error codes will appear in hexadecimal form (generally beginning with A2, A3, A4, A5, A6, A7, AD, AE, or E1). However, when viewed from the System Error Log, the messages will appear as text. To determine a possible error condition for the service processor, the System Error Log (see "Viewing error logs from the Configuration/Setup Utility program" on page 21) will refer you to the management module log in the SBCE unit.

SCSI error codes

Error code	FRU/action
All SCSI Errors One or more of the following might be causing the problem:	• **Verify that the SCSI devices are configured correctly.**
• A failing SCSI device (adapter, drive)	
• An improper SCSI configuration	
• Duplicate SCSI IDs in the same SCSI chain	

Temperature error messages

Message	Action
System over temperature for CPU *x*.	1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 27 2. Replace microprocessor *x*.
Blade Storage Expansion option over recommended temperature.	1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 27 2. Replace the SCSI hard disk drives. 3. Replace the Blade Storage Expansion option.
CPU *x* over temperature.	1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 27 2. Replace microprocessor *x*.

Power error messages

Message	Action
BSE +12V over recommended voltage	1. **Check SBCE power** (see SBCE *Hardware Maintenance Manual*). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +12V under recommended voltage	1. **Reseat blade storage expansion option.** 2. Replace blade storage expansion option.
BSE +5V over recommended voltage	1. **Reseat blade storage expansion option.** 2. Replace blade storage expansion option.
BSE +5V under recommended voltage	1. **Reseat blade storage expansion option.** 2. Replace blade storage expansion option.
BSE +18V over recommended voltage	1. **Reseat blade storage expansion option.** 2. Replace blade storage expansion option.
BSE +18V under recommended voltage	1. **Reseat blade storage expansion option.** 2. Replace blade storage expansion option.
BSE +3.3V over recommended voltage	1. **Reseat blade storage expansion option.** 2. Replace blade storage expansion option.
BSE +3.3V under recommended voltage	1. **Reseat blade storage expansion option.** 2. Replace blade storage expansion option.

> **NOTE**
>
> See "System" on page 104 to determine which components should be replaced by a field service technician.

Message	Action
BSE +2.5V over recommended voltage	1. **Reseat blade storage expansion option.** 2. Replace blade storage expansion option.
BSE +2.5V under recommended voltage	1. **Reseat blade storage expansion option.** 2. Replace blade storage expansion option.
BSE +1.8V over recommended voltage	1. **Reseat blade storage expansion option.** 2. Replace blade storage expansion option.
BSE +1.8V under recommended voltage	1. **Reseat blade storage expansion option.** 2. Replace blade storage expansion option.
System Power Good fault	1. **Check SBCE power** (see SBCE *Hardware Maintenance Manual*). 2. Reseat blade server. 3. Replace blade server.
VRM Power Good fault	1. **Check SBCE power** (see SBCE *Hardware Maintenance Manual*). 2. Reseat blade server. 3. Replace blade server.
System over recommended voltage for +12v.	1. **Check SBCE power** (see SBCE *Hardware Maintenance Manual*). 2. Reseat blade server. 3. Replace blade server.
System over recommended voltage for +1.25v.	1. **Reseat blade server.** 2. Replace blade server.
System over recommended voltage for +1.5v.	1. **Reseat blade server.** 2. Replace blade server.
System over recommended voltage for +2.5v.	1. **Reseat blade server.** 2. Replace blade server.
System over recommended voltage for +3.3v.	1. **Reseat blade server.** 2. Replace blade server.
System over recommended 5V fault.	1. **Reseat blade server.** 2. Replace blade server.
VRM voltage over recommended tolerance.	1. **Reseat blade server.** 2. Replace blade server.
System under recommended voltage for +12v.	1. **Check SBCE power** (see SBCE *Hardware Maintenance Manual*). 2. Reseat blade server. 3. Replace blade server.
System under recommended voltage for +1.25v.	1. **Reseat blade server.** 2. Replace blade server.
System under recommended voltage for +1.5v.	1. **Reseat blade server.** 2. Replace blade server.

See "System" on page 104 to determine which components should be replaced by a field service technician.	

Message	Action
System under recommended voltage for +2.5v.	1. **Reseat blade server.** 2. Replace blade server.
System under recommended voltage for +3.3v.	1. **Reseat blade server.** 2. Replace blade server.
System under recommended 5V fault.	1. **Reseat blade server.** 2. Replace blade server.

System shutdown

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

System errors

☀ **NOTE**	
See "System" on page 104 to determine which components should be replaced by a field service technician.	

Message	Action
Internal Error CPU x fault	1. **Reseat:** a. I/O Expansion Option b. Blade Storage Expansion option. c. IDE hard drive. 2. Replace: a. Failing PCI adapter b. Microprocessor *x*. c. I/O Expansion Option. d. Blade Storage Expansion option. e. IDE hard drive. f. System board.

Temperature-related system shutdown

NOTE	
See "System" on page 104 to determine which components should be replaced by a field service technician.	

Message	Action
System shutoff due to CPU x over temperature	1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 27 2. Replace microprocessor *x*.
System shutoff due to Blade Storage Expansion option temperature	1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 27 2. Replace Blade Storage Expansion option.
CPU x shut off due to over temperature	1. **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 27 2. Replace microprocessor *x*.
Critical Blower Failure, blade server powering down	• **See SBCE *Hardware Maintenance Manual*.**
Power Modules are over temperature, blade server powering down	• **See SBCE *Hardware Maintenance Manual*.**

DASD checkout

NOTE	
See "System" on page 104 to determine which components should be replaced by a field service technician.	

Message	Action
Hard drive x removal detected (level-critical; hard drive x has been removed)	• **Information only, take action as appropriate.**

Undetermined problems

> **NOTE**
>
> When troubleshooting a problem with the blade server, it must be determined whether the problem is a blade server problem or a problem with the SBCE unit.
>
> - If the SBCE unit contains more than one blade server and only one of the blade servers exhibits the problem, it is likely that it is a blade server problem.
>
> - If all of the blade servers exhibit the same symptom, it is probably a SBCE unit problem; for more information, see the Intel Server System SBCE *Hardware Maintenance Manual*.

Use the information in this section if the diagnostic tests did not identify the failure, the devices list is incorrect, or the system is inoperative.

Notes:

1. Damaged data in CMOS can cause undetermined problems. To reset the CMOS, remove the battery for 15 minutes, and then reinstall the battery.

2. Damaged data in BIOS code can cause undetermined problems.

    - Flash the system with the latest BIOS code.

    - If the system appears inoperative, recover the BIOS (see "Recovering the BIOS code" on page 25).

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

1. Check that the front panel is connected to the system board.
2. If no LEDs on the front panel are working, replace the front panel; then, try to power up the blade server from the SBCE web interface (see the SBCE documentation for more information).
3. Turn off the blade server.
4. Remove the blade server and remove the cover.
5. Remove or disconnect the following devices (one at a time) until you find the failure (reinstall, turn on and reconfigure the blade server each time):
    - I/O adapter
    - Drives
    - Memory modules (minimum requirement = two 256 MB DIMMs)

    > **NOTE**
    >
    > Minimum operating requirements are:
    > a. System board
    > b. One microprocessor
    > c. Memory (with a minimum of two 256 MB DIMMs)
    > d. A functioning SBCE

6. Install and turn on the blade server. If the problem remains, suspect the following FRUs in the order listed:
    - DIMM
    - System board
    - Microprocessor

Notes:

1. If the problem goes away when you remove an I/O adapter from the system and replacing that I/O adapter does not correct the problem, suspect the system board.

2. If you suspect a networking problem and all the system tests pass, suspect a network cabling problem external to the system.

Problem determination tips

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

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

⊸ **NOTE**

To eliminate confusion, identical systems are considered identical only if they:

1. Are the exact machine type and models
2. Have the same BIOS level
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same diagnostics code (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operation system control files

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

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10 Parts listing

This parts listing supports the Intel® Server Compute Blade SBXL52.
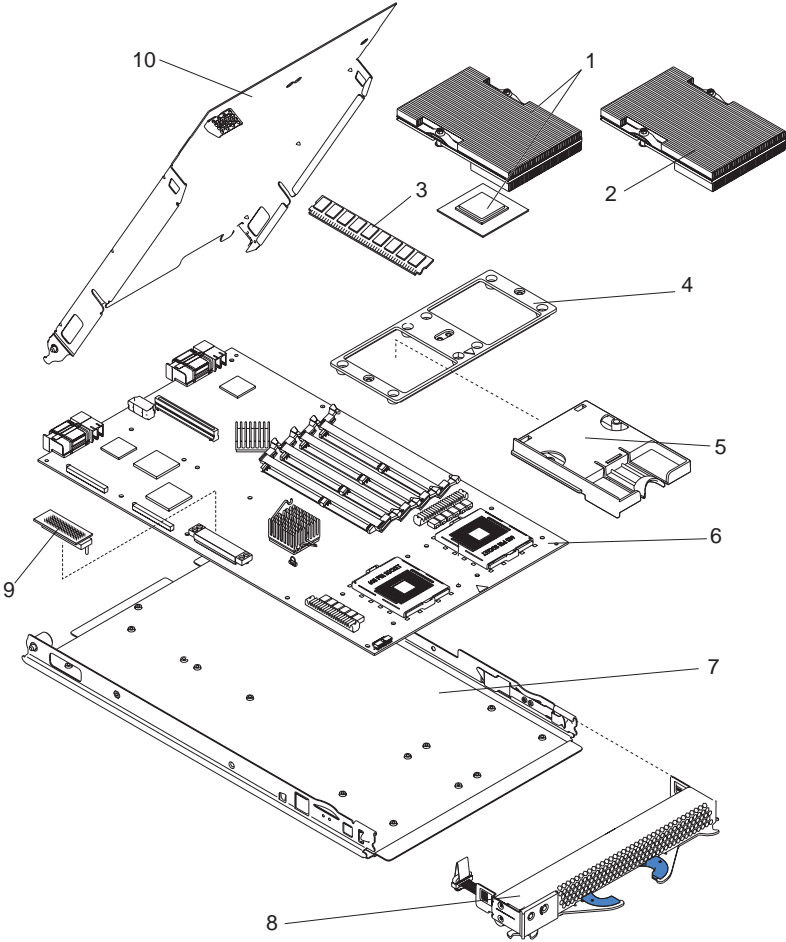
System

Index	System, Type	CRU/ FRU
1	Microprocessor 533/2.80-512 with heat sink (model 21X)	FRU
1	Microprocessor 533/3.06-512 with heat sink	FRU
2	Heat sink assembly (all models)	FRU
3	Memory module, 256 MB PC2100 ECC (all models)	CRU
3	Memory module, 512 MB PC2100 ECC (optional)	CRU
3	Memory module, 1 GB PC2100 ECC (optional)	CRU
3	Memory module, 2 GB PC2100 ECC (optional)	FRU
4	Retention module (all models)	CRU
5	Microprocessor heat sink filler (model 21X)	FRU
6	System board (all models)	FRU
7	Blade base (all models)	CRU
8	Front bezel with customer card (all models)	CRU
9	Terminator card (all models)	CRU
10	Cover and label (all models)	CRU
	Label kit (all models)	CRU
	Hard disk drive, 40 GB 5400 RPM 2.5 (optional)	CRU
	IDE tray/interposer card (optional)	CRU
	Filler, hard disk drive (optional)	CRU
	Blade expansion (optional)	CRU
	Blade expansion base (optional)	CRU
	Battery, 3.0 volt (all models)	FRU
	Fibre channel adapter tray (optional)	CRU/ FRU
	Gb Ethernet expansion card (optional)	FRU
	Fibre channel expansion card (optional)	FRU

Index	System, Type	CRU/ FRU
	Miscellaneous parts kit (all models)	FRU

- Screw, M3.5x10 Phillips pan head, hard disk drive and adapter card tray (4)
- Screw, M3.5 x 5 hex flange, system board (6)
- Light pipe, hard disk drive LEDs (2)
- Screw, mobile hard disk drive tray, M3 x # slot cap (4)
- Screw, 440, D connector (2)
- Screw, M3.5 x 7 slotted Phillips hex flange head (8)
- Label, customer write-on (1)

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A Getting help and technical assistance

This appendix contains information about where to go for additional information about Intel and Intel products, what to do if you experience a problem with your server.

Before you call

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system.

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

Using the documentation

Information about your Intel SBCE system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software.

Hardware/Software service and support

Contact your Intel Support Representative.

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