

# **Intel® Server Compute Blade SBX82: Hardware Maintenance Manual and Troubleshooting Guide**

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

Order Number C90896-001

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# Safety and regulatory information

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## ⇒ 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.
- When lifting any heavy object:
  1. Ensure you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly, or twist, when you attempt to lift.
  4. Lift by standing or by pushing up with you leg muscles; this action removes the strain from the muscles in your back. Do not attempt to lift any object that weighs more than 16 kg (35lb) or any object that you think is too heavy for you.
- Do not perform any action that causes hazards to the customer, or makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- 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, unless instructed otherwise in the installation and configuration procedures.**

**Important: Disconnect all power before performing a mechanical inspection.**

Observe the following rules when working on electrical equipment.

- Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not protect you when working with live electrical currents.
- Many customers have rubber floor mats (near their equipment) that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.



- Find the emergency power-off (EPO) switch, disconnect switch, or electrical outlet in the room. If an electrical accident occurs, you can quickly turn off the switch or unplug the power cord.
- Do not work alone under hazardous conditions, or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box (that supplies power to the machine) and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you. Remember: another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.
  - Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
- When using testers, set controls correctly and use the approved probe leads and accessories for that tester.
- Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.
- Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of the maintenance information. Use extreme care when measuring high voltages.
- 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 a plastic dental inspection mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- When the power is on and power supply units, blowers and fans are removed from their normal operating position in a machine, do not attempt to service the units. This practice ensures correct grounding of the units.
- If an electrical accident occurs, use caution:
  - Switch power off
  - Send another person to get help/medical aid

## Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (IC) should be considered sensitive to electrostatic discharge (ESD). ESD 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.
  - 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.

### ⇒ NOTE

The use of a grounding system is desirable but not required to protect against ESD damage.



### DANGER

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

To avoid a shock hazard:

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

To Connect	To Disconnect
<ol style="list-style-type: none"> <li>1. Turn everything OFF.</li> <li>2. First, attach all cables to devices.</li> <li>3. Attach signal cables to connectors.</li> <li>4. Attach power cords to outlet.</li> <li>5. Turn device ON.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn everything OFF.</li> <li>2. First, remove power cords from outlet.</li> <li>3. Remove signal cables from connectors.</li> <li>4. Remove all cables from devices.</li> </ol>



**CAUTION:**

If your system has a module containing a lithium battery, replace it only with the 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 degrees C (212 degrees 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:

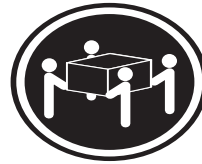
Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)



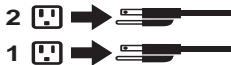
**CAUTION:**

Use safe practices when lifting.



**CAUTION:**

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



**CAUTION:**

Do not place any object weighing more than 82 kg (180 lbs.) on top of rack-mounted devices.



**CAUTION:**

Do not place any object weighing more than 82 kg (180lbs.) on top of rack-mounted devices.

**CAUTION:**

To avoid personal injury, before lifting the unit, remove all the blades to reduce the weight.

**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 TUV/CB to EN60950 3rd Edition TUC/CB - EMKO-TSE (74-SEC) 207/94
International:	TUVCB to IEC 60950, 3rd Edition plus all international deviations
Australia/New Zealand:	CB Report to IEC 60950, 3rd Edition plus Australia/New Zealand deviations

<b>Electromagnetic compatibility (ECM)</b>	
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 EN6100-3-3 Voltage Flicker
Japan:	VCCI Class A ITE (CISPR 22, Class A Limit) IEC 1000-3-2 Limit for Harmonic Current Emissions
Australia/New Zealand:	AS/NZS 3548, Class A Limit
Taiwan:	BSMI Approval
Korea:	RRL Approval
Russia:	GOST Approval

## Electromagnetic compatibility notices (USA)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

### ⇒ **NOTE**

Class A device definition: If a Class A device is installed within the is system, then the system is to be considered a Class A system. In this configuration, operation of this equipment in a residential area is likely to cause harmful interference.

### ⇒ **NOTE**

This product is intended to be installed with CAT5 cable, or equivalent, to minimize electrical interference.

## 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 Canadien 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:

기종별	사용자안내문
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.

※ 비교

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 a commercial environment so that distributors or users pay attention to this point.  If this product is sold or purchased improperly, please exchange this product to one that 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.
<p>⇒ <b>NOTE</b> Class A device: operated in a commercial area. Class B device: operated in a residential area.</p>	



# 1 Introducing the Intel® Server Compute Blade SBX82

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These high-performance blade servers are ideally suited for networking environments that require superior processor performance, efficient memory management, flexibility, and reliable data storage.

This *Hardware Maintenance Manual and Troubleshooting Guide* provides information about:

- Setting up the blade server
- Starting and configuring the blade server
- Installing hardware options
- Installing the operating system
- Performing basic troubleshooting of the blade server

Record information about your Intel® Server Compute Blade SBX82 in the following table.

⇒ **NOTE**

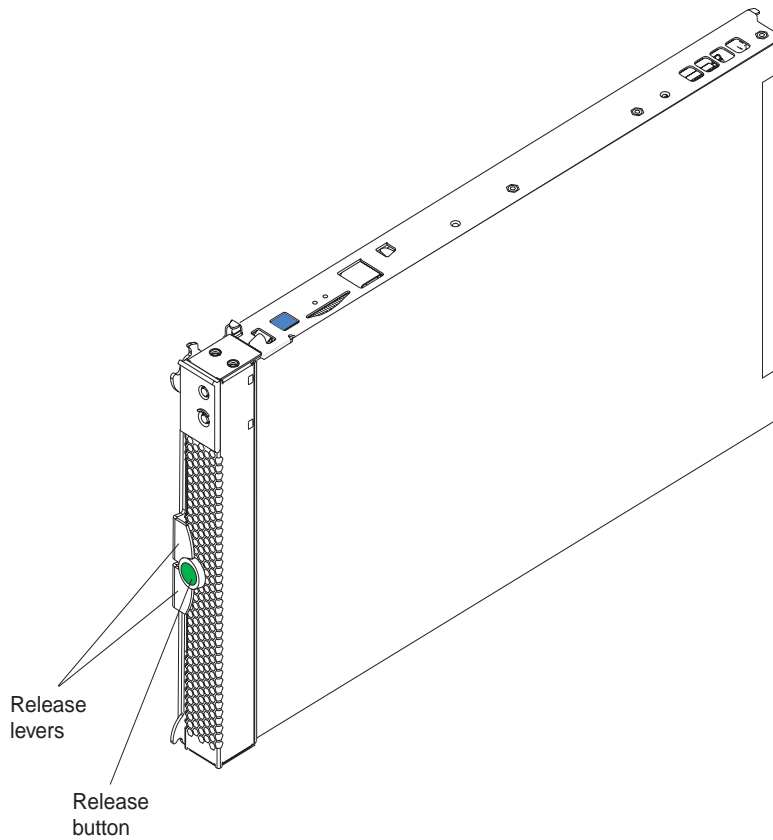
The model number and serial number are on the ID label that is behind the control panel door on the front of the blade server, and on a label on the right side of the blade server that is visible when the blade server is not in the SBCE unit.

<b>Product name</b>	Intel® Server Compute Blade SBX82
<b>Product code</b>	
<b>Model number</b>	_____
<b>Serial number</b>	_____

⇒ **NOTE**

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

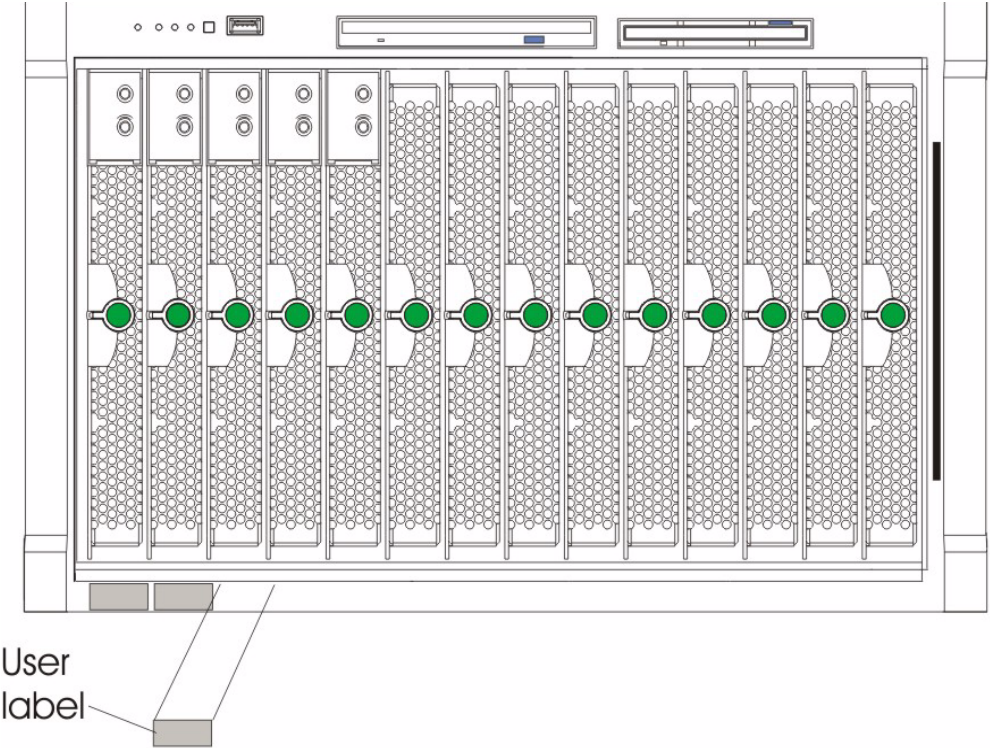
Figure 1. Blade server release levers



A set of user labels comes with the Intel® Server Compute Blade SBX82. When you install the blade server in the SBCE unit, write identifying information on a label and place the label on the SBX82 unit bezel.

Figure 2 shows the placement of the label, just below the blade server, on the SBCE unit.

Figure 2. Label placement on the SBCE unit



TP00216

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

## Features and specifications

This section provides a summary of the features and specifications of your blade server. Use the Configuration/Setup Utility program to determine the specific type of processor that is in the blade server.

### Reliability, availability, and serviceability features

Three of the most important features in server design are reliability, availability, and serviceability (RAS). These RAS features help to ensure the integrity of the data stored on the blade server; that the blade server is available when you want to use it; and that should a failure occur, you can easily diagnose and repair the failure with minimal inconvenience.

The blade server has the following RAS features:

- Advanced Configuration and Power Interface (ACPI)
- Automatic error retry or recovery
- Automatic server restart
- Built-in monitoring for temperature, voltage, hard disk drives, and flash drives
- Chipkill\* memory for DIMMs with a capacity of 512 MB or greater
- Customer upgradeable basic input/output system (BIOS) code
- Diagnostic support of Ethernet controllers
- Error codes and messages
- ECC protection on the L2 cache
- ECC memory
- Failover Ethernet support
- Hot-swap drives on optional small computer system interface (SCSI) storage expansion unit
- Light Path Diagnostics\* feature
- Power-on self-test (POST)
- Predictive Failure Analysis\* (PFA) alerts
- Processor serial number access
- Service processor that communicates with the management module to enable remote blade server management
- SDRAM with serial presence detect (SPD) and vital product data (VPD)
- System error logging
- VPD (includes information stored in nonvolatile memory for easier remote viewing)
- Wake on LAN\* capability

## Intel® Server Compute Blade SBX82 features

The design of your blade server takes advantage of advancements in memory management and data storage. Your blade server uses the following features and technologies:

- **Disk drive support**  
The blade server supports up to two 2.5-inch SCSI disk drives.
- **Intel Architecture**  
Intel architecture technology leverages proven innovative technologies to build powerful, scalable, reliable Intel-processor-based servers. The technology includes features such as Light Path Diagnostics, Predictive Failure Analysis (PFA), and Advanced System Management.
- **Impressive performance using the latest processor technology**  
Your blade server supports up to two Intel® Xeon™ processors. The blade server comes with at least one processor installed; you can install an additional processor to further enhance performance and symmetric multiprocessing (SMP) capability.
- **Integrated network environment support**  
The blade server comes with two integrated dual Gigabit Ethernet controllers. Each Ethernet controller has an interface for connecting to 10/100/1000-Mbps networks through an Ethernet-compatible switch module on the SBCE unit. The blade server automatically selects between 10BASE-T and 100/1000BASE-TX environments. Each controller provides full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the Ethernet local area network (LAN). The controllers support Wake on LAN technology.
- **I/O expansion**  
The blade server comes with two connectors on the system board for an optional expansion card, such as the Intel® Blade Server Fibre Channel Expansion Card or the Intel® Blade Server Ethernet Expansion Card, for adding more network communication capabilities to the blade server.
- **Large system memory**  
The memory bus in your blade server supports up to 8GB of system memory. The memory controller provides support for up to four industry-standard 1.8 V, 184-pin, double-data-rate (DDR2-400), PC3200, registered synchronous dynamic random-access memory (SDRAM) with error correcting code (ECC) DIMMs.
- **Light Path Diagnostics**  
The Light Path Diagnostics feature provides light-emitting diodes (LEDs) to assist in isolating problems with the blade server. An LED on the blade server control panel is lit if an unusual condition or a problem occurs. If this happens, you can look at the LEDs on the system board to locate the source of the problem.
- **PCI Express\***  
PCI Express\* is a fully serial interface that can be used for universal connectivity for use as a chip-to-chip interconnect, I/O interconnect for adapter cards, and an I/O attachment point to Gigabit networking devices. PCI Express bridges a PCI Express bus to a PCI-X bus and converts the transactions on the PCI bus to transactions on the PCI-X bus. Using the expansion card connector you can add additional LAN interfaces. The expansion card connector supports PCI-X 133 and bridges PCI Express into PCI-X 133.

- **Power throttling**

Each blade server is powered by two SBCE unit redundant 2000 W power supply modules. By enforcing a power policy known as oversubscription, the SBCE unit can load-share power between two power modules to ensure efficient power for each device in the SBCE unit. This policy is enforced when the initial power is applied to the SBCE unit or when a blade server is inserted into the SBCE unit.

The possible settings for this policy are:

- Redundant without performance impact
- Redundant with performance impact
- Non-redundant

You can configure and monitor the power environment using the management module. For more information about configuring and using power throttling, refer to your management module manual.

## Intel® Server Compute Blade SBX82 specifications

The following table provides a summary of the features and specifications of the Intel® Server Compute Blade SBX82.

⇒ **NOTE**

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

⇒ **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.

<p><b>Processor:</b> Supports up to two processors</p> <ul style="list-style-type: none"> <li>• Intel® Xeon™ processors with an 800 MHz FSB at speeds up to 3.6GHz</li> <li>• Intel® E7520 chipset</li> </ul> <p><b>Memory:</b></p> <ul style="list-style-type: none"> <li>• Dual channel 400 MHz (DDR2) with four DIMM slots (8 GB maximum)</li> <li>• Type: 2-way interleaved, DDR2, PC3200, ECC SDRAM registered x4 (Chipkill*) DIMMs only</li> <li>• Supports 256 MB, 512 MB, 1 GB, and 2 GB DIMMs (four DIMM slots)</li> </ul> <p><b>Service Processor:</b> Rennasas 2166 supports:</p> <ul style="list-style-type: none"> <li>• RS-485 interface</li> <li>• Serial over LAN (SOL)</li> <li>• IPMI</li> </ul> <p><b>Drives:</b> Support for two internal small form-factor SCSI drives</p>	<p><b>Size:</b></p> <ul style="list-style-type: none"> <li>• Height: 24.5 cm (9.7 inches)</li> <li>• Depth: 44.6 cm (17.6 inches)</li> <li>• Width: 2.9 cm (1.14 inches)</li> <li>• Maximum weight: 5.4 kg (12 lb)</li> </ul> <p><b>Integrated functions:</b></p> <ul style="list-style-type: none"> <li>• Dual Gigabit Ethernet controllers</li> <li>• Expansion card interface</li> <li>• BMC with IPMI firmware</li> <li>• ATI* 7000M video controller</li> <li>• LSI* 1020 SCSI controller</li> <li>• Light Path Diagnostics</li> <li>• Local service processor</li> <li>• RS-485 interface for communication with the management module</li> <li>• Four USB buses for communication with keyboard, mouse, diskette drive, and CD-ROM drive</li> </ul> <p><b>Predictive Failure Analysis (PFA) alerts:</b></p> <ul style="list-style-type: none"> <li>• Processor</li> <li>• Memory</li> </ul>	<p><b>Electrical Input:</b> 12 V dc</p> <p><b>Environment:</b></p> <ul style="list-style-type: none"> <li>• Air temperature: <ul style="list-style-type: none"> <li>— Blade server on: 10° to 35° C (50° to 95° F). Altitude: 0 to 914 m (2998.69 ft)</li> <li>— Blade server on: 10° to 32° C (50° to 89.6° F). Altitude: 914 m to 2134 m (2998.69 ft to 7000 ft)</li> <li>— Blade server off: -40° to 60° C (-40° to 140° F)</li> </ul> </li> <li>• Humidity: <ul style="list-style-type: none"> <li>— Blade server on: 8% to 80%</li> <li>— Blade server off: 5% to 80%</li> </ul> </li> </ul>
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## Related publications

In addition to this *Hardware Maintenance Manual and Troubleshooting Guide*, the following documentation is provided in Portable Document Format (PDF) on the *Intel Server Compute Blade SBX82 Resource CD* that came with your blade server.

- *Intel® Server Compute Blade SBX82 Installation and User's Guide*

This document contains instructions for setting up and configuring the SBX82 unit and basic instructions for installing some options. It also contains general information about the SBX82 unit.

## Notices and statements used in this document

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.



## 2 Using power, controls, jumpers, switches, and indicators

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This chapter describes the power features, how to turn on and turn off the blade server, what the controls and indicators mean, and where the system board jumpers and switches are located and how to use them.

### Turning on the blade server

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

- You can press the power-control button on the front of the blade server (behind the control panel door) to start the server.

— **NOTE**

Wait until the power-on LED on the blade server flashes slowly before pressing the blade server power-control button. During this time, the service processor in the management module is initializing; therefore, the power-control button on the blade server does not respond.

— **NOTE**

While the blade server is powering up, the power-on LED on the front of the server is lit. See “Understanding the control panel and LEDs” on page 11 for the power-on LED states.

- 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 management module to do so.
- You can turn on the blade server remotely by means of the service processor in the management module.
- 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 Wake on LAN feature has not been disabled through the management-module Web interface.

## Turning off the blade server

When you turn off the blade server, it is still connected to power 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. See “Understanding the control panel and LEDs” on page 11. 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.

⇒ **NOTE**

After turning off the blade server, wait at least 30 seconds for its hard disk drives or flash drives to stop before you remove the blade server from the SBCE unit.

# Understanding the control panel and LEDs

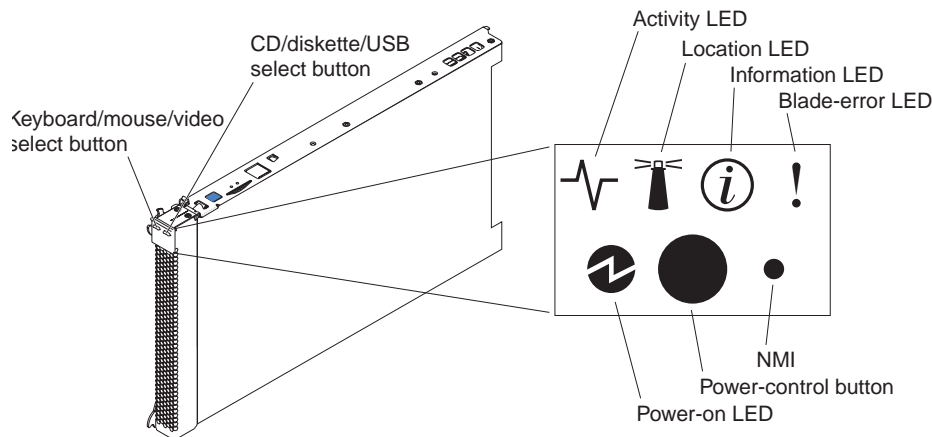
This section describes the controls and LEDs on your SBCE unit.

⇒ **NOTE**

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

⇒ **NOTE**

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



**Keyboard/mouse/video (KVM) 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 lit when the ownership of the keyboard, mouse, and video has been transferred to this blade server. It can take approximately 20 seconds to switch the keyboard, video, and mouse control to the blade server.

Although the keyboard that is attached to the SBCE unit is a PS/2\*-style keyboard, communication with it is through the USB. The operating system in the blade server must provide USB support for the blade server to recognize and use the keyboard and mouse. The SBCE unit uses USB for internal communication with these devices. When you are running an operating system that does not have USB device drivers, such as in the following situations, 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
- Running the Broadcom firmware CD for a blade server

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

You can also press keyboard keys in the following sequence to switch keyboard/mouse/video control between blade servers:

**NumLock NumLock *blade\_server\_number* Enter**

Where *blade\_server\_number* is the two-digit number for the blade bay in which the blade server is installed.

**CD/diskette/USB select button:** Press this button to associate the CD-ROM drive, diskette drive, and USB port with this blade server. The LED on this button flashes while the request is being processed, then is lit when the ownership of the CD-ROM drive, diskette drive, and USB port has been transferred to this blade server. It can take approximately 20 seconds for the operating system in this blade server to recognize the CD-ROM drive, diskette drive, and USB port.

The operating system in the blade server must provide USB support for the blade server to recognize and use the CD-ROM drive, diskette drive, and USB port. The SBCE unit uses the USB for internal communication with these devices. If there is no response when you press the CD/diskette/USB select button, you can use the management-module Web interface to determine whether local control has been disabled on the blade server.

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

**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 lit also. The location LED can be turned off through the management-module Web interface.

**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 system error log. The information LED can be turned off through the management-module Web interface.

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

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

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

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

— **NOTE**

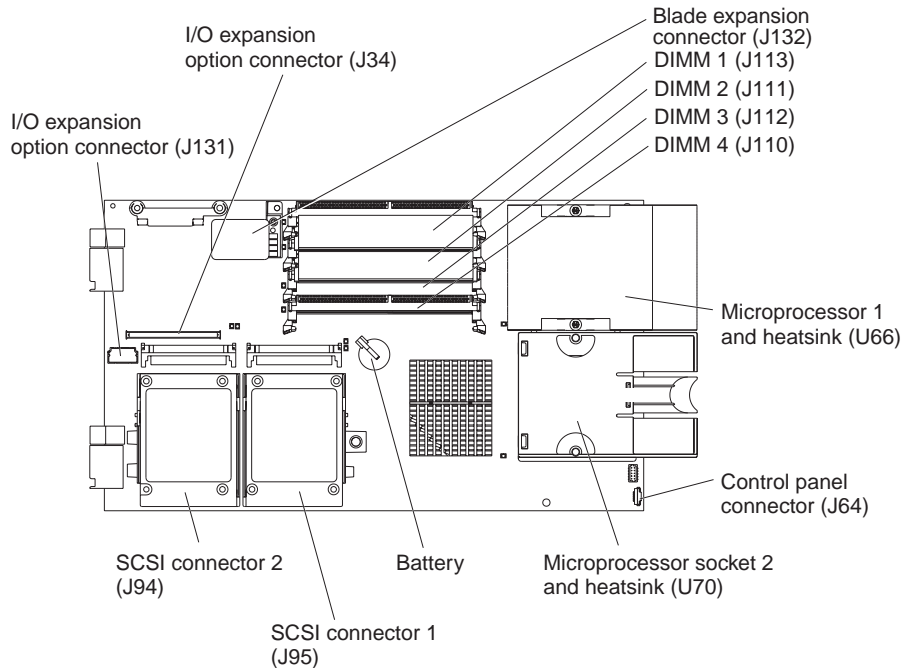
The power-control button has effect only if local power control is enabled for the blade server. Local power control is enabled and disabled through the management-module Web interface.

**Non-maskable interrupt (NMI) button:** Press this button to start diagnostic and debugging tests. Use the tip of a paper clip or other pointed object to reset this button.

## System board illustration

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

Figure 3. System board components



## Using system board switches

This section describes the system board switches on your Intel® Server Compute Blade SBX82.

### ⇒ NOTE

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

Figure 4 on page 14 and Figure 5 on page 15 show the LEDs on the system board for the Intel® Server Compute Blade SBX82. Refer to Table 1 and Table 2 on page 15 for more information about the Light Path Diagnostics LED locations and settings. Refer to these illustrations and tables when solving problems with the blade server.

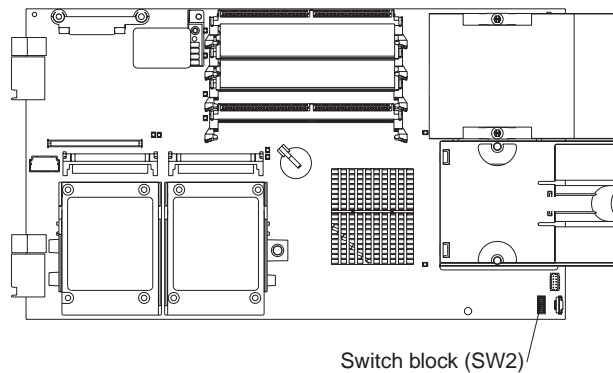
### ⇒ NOTE

Power is available to relight the Light Path Diagnostics LEDs for a small 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.

## Using switch block 2 (SW2)

You must 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. The following illustration and Table 1 on page 14 show the location and the settings for SW2.

*Figure 4. System board switch block (SW2) location*



*Table 1. Switch block 2 (SW2) and settings*

Switch number	Description
SW2	<p>Switch block: Eight switches</p> <ul style="list-style-type: none"><li>• 1 - BIOS backup page jumper. - Open: the BIOS boots from the Primary BIOS page. - Closed: the BIOS boots from the backup BIOS page.</li><li>• 2 - Wake on LAN Bypass - Open: Enabled - Closed: Disabled (default)</li><li>• 3 - Reserved</li><li>• 4 - Reserved</li><li>• 5 - Reserved</li><li>• 6 - Clear CMOS - Open: Disabled - Closed: Enabled</li><li>• 7 - Reserved</li><li>• 8 - Bypass power-on password - Open: Disabled (default) - Closed: Enabled</li></ul>

## Using Light Path Diagnostics to troubleshoot the system board

After the system board is removed from the chassis, you can press Light Path Diagnostics (SW4) to troubleshoot system board component problems. See Figure 5 on page 15 and Table 2 on page 15 for more information about locating Light Path Diagnostics LEDs and what to do if an error LED is lit.

Figure 5. Light Path Diagnostics switch (SW4) and error LEDs

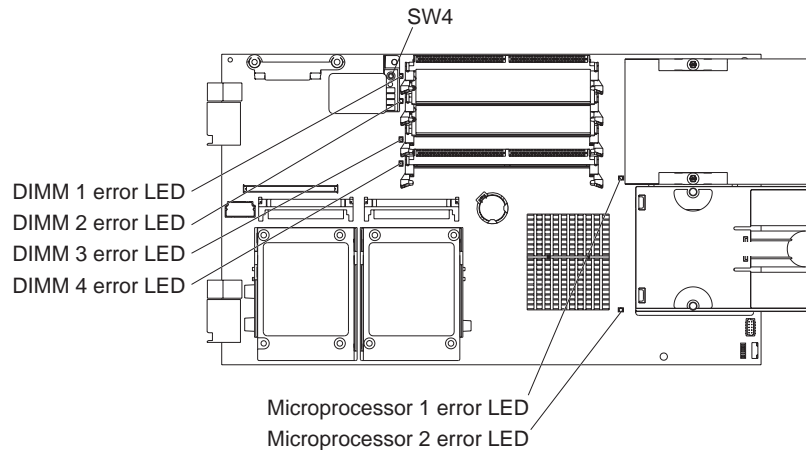


Table 2. SW4 Light Path Diagnostics LED locations

LED name and location	Description
DIMM 1 (CR6), DIMM 2 (CR5), DIMM 3 (CR4), DIMM 4 (CR201) error	There is a problem with the corresponding DIMM.
BMC fault (CR11)	There is a problem with the corresponding BMC.
Processor 1 error (CR12) Processor 2 error (CR13)	There is a problem with the corresponding processor.
System board fault (CR30)	There is a problem with the corresponding system board.
Light Path Diagnostics LED (CR111)	Lights to show the circuit is active and functioning.

Figure 6. Light Path Diagnostics switch (SW4) and error LEDs



*Table 3. SW4 Light Path Diagnostics LED locations*

LED error	Action
NMI	Check the error log for additional information. Reboot the blade server. If the error still exists, replace the system board.
MIS	Check the processors to make sure they are at the same speed.
SBRD	Reboot the blade server. If the error still exists, replace the system board.
TEMP	Check the SBCE unit blowers and air inlets. Check the room temperature.
Light Path Diagnostics LED	Check the Light Path Diagnostics LED for errors
Light Path Diagnostics button (SW4)	Press SW4 to locate faults on the system board. If the processor or memory LED is lit, reseal the component. If the LED remains lit, replace the defective component.

See “Diagnosing problems using Light Path Diagnostics” on page 70 for information on what action to take if there is a component error.



## 3 Customer replaceable units

---

This chapter provides instructions for installing hardware options in 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 installing options in the blade server, read the following information:

- Read the safety information beginning on page vii 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 the 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.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the blade server, or open or close a latch.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the blade server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.

### System reliability considerations

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

⇒ **NOTE**

When using a single processor, you must install it into the CPU 1 socket.

### Handling static-sensitive devices

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

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

- When working on the SBCE unit, use an electrostatic discharge (ESD) wrist strap, especially when you will be handling modules, options, and blade servers. To work properly, the wrist strap must have a good contact at both ends (touching your skin at one end and firmly connected to the ESD connector on the front or back of the SBCE unit).
- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.

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

## Major components of the blade server

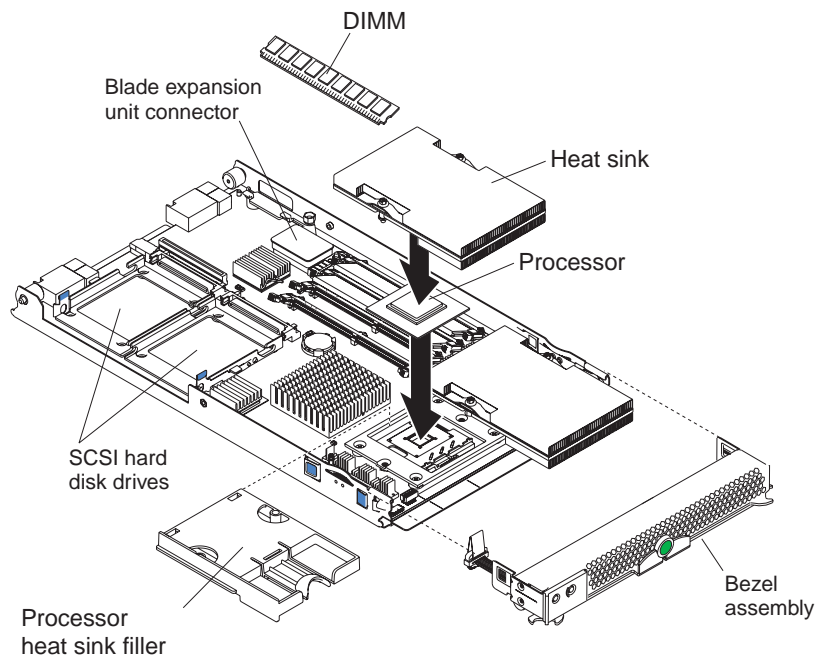
You must remove the blade server from the SBCE unit and remove the cover to see the components.

### ⇒ NOTE

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

The following figure shows the major components of the SBX82 unit.

Figure 7. Major components of the Intel® Server Compute Blade SBX82



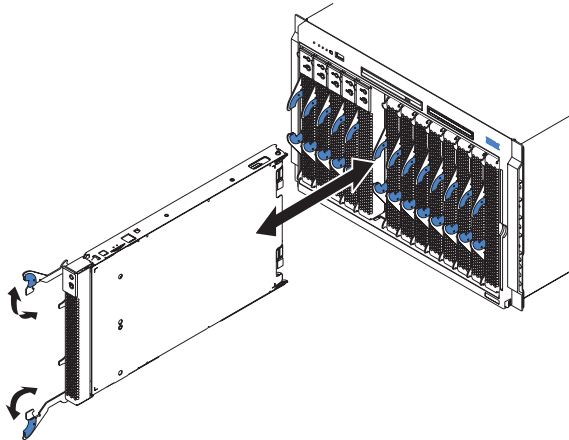
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## Removing the blade server from the SBCE unit

### — NOTE

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

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



### — 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.
- Make note of 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.

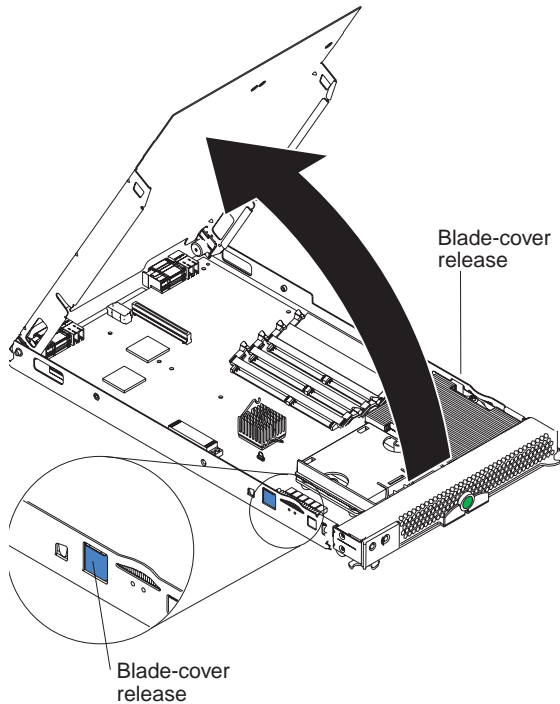
### — Attention

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

2. Open the two release levers (see figure above). 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 farther 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.

# Opening the blade server cover

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



Complete the following steps to open the blade server cover:

1. Read the safety information beginning on page vii and “Installation guidelines” on page 17.
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 and store for future use.

## Statement 21:

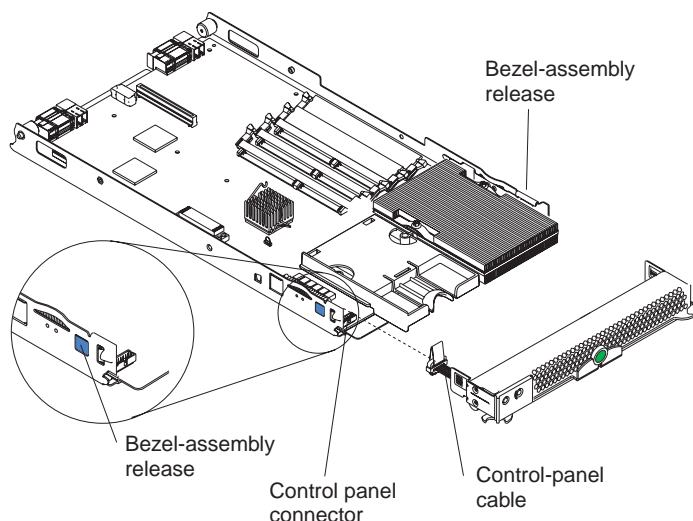


## CAUTION:

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

## 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 the blade server.



Complete the following steps to remove the blade server bezel assembly:

1. Read the safety information beginning on page vii and “Installation guidelines” on page 17.
2. Open the blade server cover (see “Opening the blade server cover” on page 20 for instructions).
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 a SCSI hard disk drive

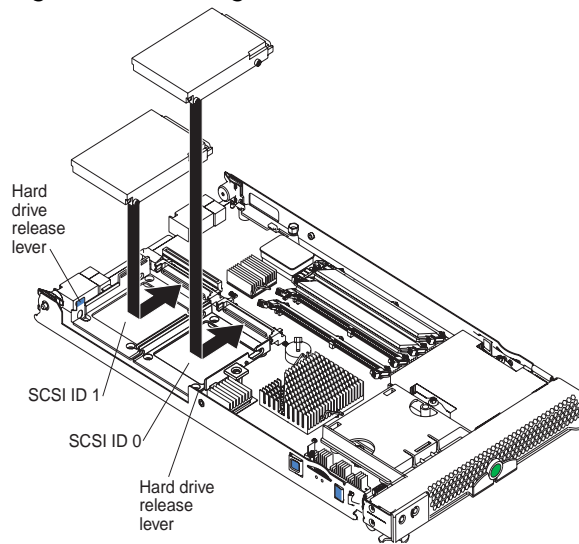
The blade server has two connectors on the system board for installing optional Ultra320 SCSI hard disk drives.

Each Ultra320 SCSI connector is on the same bus. Depending on your blade server, at least one SCSI hard disk drive might already be installed. If your blade server is equipped with one SCSI hard disk drive, you can install an additional SCSI hard disk drive. These two SCSI hard disk drives can be used to implement and manage a redundant array of independent disks (RAID) level-1. See “Configuring a SCSI RAID array” on page 59 for information about SCSI RAID configuration.

**Attention:** To maintain proper system cooling, do not operate the system unit without a blade server, expansion unit, or filler blade installed in each blade bay.

The following illustration shows how to install a SCSI hard disk drive and tray in the blade server.

Figure 8. Installing a SCSI drive



### ⇒ Note

Do not install a SCSI hard disk drive in SCSI connector 1 (SCSI ID 1) if you intend to also install an optional standard expansion card. The standard expansion card occupies the same area as the second drive.

To install a SCSI hard disk drive, complete the following steps:

1. Read the safety information beginning on page vii and “Installation guidelines” on page 17.
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 19 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 20 for instructions).
5. Locate SCSI connector 0 (J95).

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

6. Place the drive into the tray and push it, from the rear edge of the drive, into the connector until the drive moves past the lever at the back of the tray. The drive clicks into place.
7. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 41.

## Removing a SCSI hard disk drive

To remove the SCSI hard disk drive, complete the following steps:

1. Read the safety information beginning on page vii and “Installation guidelines” on page 17.
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 19 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 20 for instructions).

5. Locate SCSI connector 1 and slowly pull the blue lever at the back of the hard disk drive tray to disengage the drive from its tray.
6. From the rear edge of the drive, slide the drive out of the SCSI connector.

**Attention:** To maintain proper system cooling, do not operate the system unit without either a blade server, expansion unit, or filler blade installed in each blade bay for more than 1 minute.

## Installing memory modules

The following notes describe the types of dual inline memory modules (DIMMs) that the blade server supports and other information that you must consider when installing DIMMs:

- The system board contains four DIMM connectors and supports two-way memory interleaving.
- The DIMM options that are available for your blade server are 256 MB, 512 MB, 1 GB, and 2 GB. Your blade server supports a minimum of 256 MB and a maximum of 8 GB of system memory.
- Your blade server comes with two DIMMs in the DIMM 1 (J113) and DIMM 2 (J111) memory connectors.

When you install additional DIMMs, be sure to install them as a pair, in DIMM connectors 3 (J112) and 4 (J110).

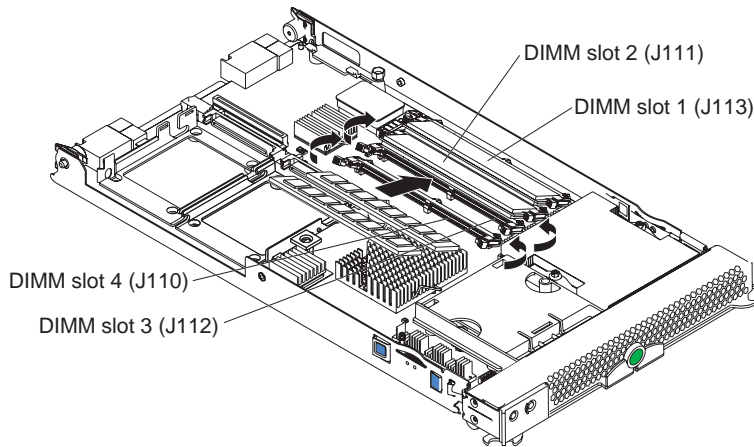
Install the DIMMs in the following order:

Pair	DIMM connectors
First	1 (J113) and 2 (J111)
Second	3 (J112) and 4 (J110)

- When you install memory, you must install a pair of matched DIMMs.
- Both DIMMs in a pair must be the same size, speed, type, and technology. You can mix compatible DIMMs from various manufacturers.
- The second pair does not have to be DIMMs of the same size, speed, type, and technology as the first pair.
- Install only 1.8 V, 240-pin, DDR2, PC3200, registered SDRAM with ECC DIMMs. These DIMMs must be compatible with the latest PC3200 SDRAM Registered DIMM specification, which is available from <http://www.jedec.org/>. For a current list of supported DIMMs for your blade server, see the *SBX82 Memory Qualification List*.
- 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, it 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 53 for more information.

Figure 9 shows how to install DIMMs on the system board for the blade server.

Figure 9. Installing DIMMS



Before you begin, read the documentation that comes with the DIMMs.

Complete the following steps to install a DIMM:

1. Read the safety information beginning on page vii and “Installation guidelines” on page 17.
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 19 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 20 for instructions).
5. Locate the DIMM connectors on the system board. Determine the connectors into which you will install the DIMMs.
6. Touch the non-conductive package that contains the DIMM option to any *unpainted* metal surface on the SBCE unit or any *unpainted* metal surface on any other grounded rack component in the rack you are installing the DIMM option in for at least 2 seconds. 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 key aligns 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. Make sure 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. Reinsert the DIMM.
8. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 41.



## Installing an additional processor

The blade server comes with one or two processors installed on the system board. The blade server supports two processors. With two processors, 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 processors. If your blade server comes with one processor, you can install a second processor.

### Notes:

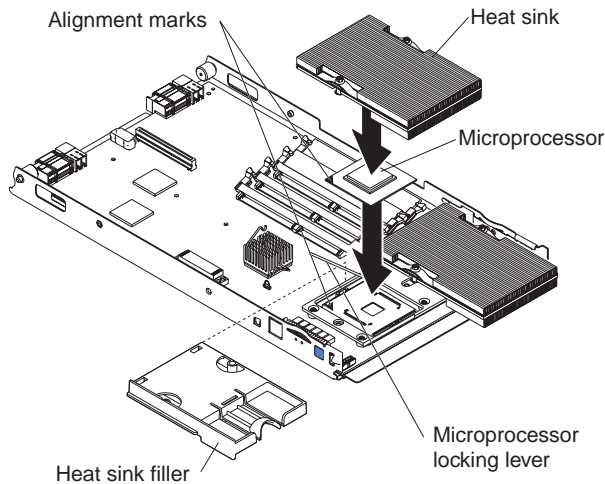
1. You can not remove the single processor and replace it with a different type of processor of greater or lesser speed.
2. If you install a second processor, it must be of the same processor type and speed as the first processor.

To use SMP, obtain an SMP-capable operating system.

The following notes describe the type of processor that the server supports and other information that you must consider when installing a processor. To ensure proper blade server operation when you install a second processor, observe the following precautions.

- Always install processors that have the same cache size and type, the same clock speed, and identical internal and external clock frequencies (including system bus speed).
- Make sure that the processor with the lowest feature set is the startup (bootstrap) processor, installed in the processor 1 socket (U66).
- For a list of processors that are supported by your blade server, see the *SBX82 Specification Update* at the Intel Business Link (IBL).
- Thoroughly review the documentation that comes with the processor, so that you can determine whether you have to update the blade server BIOS code. The latest level of BIOS code for your blade server is available from IBL.
- The processor sockets in this server contain built-in termination for the processor bus; therefore, no terminator card is required if a processor socket 2 is empty. However, for proper airflow, this socket must contain a processor heat-sink filler, sometimes called a processor baffle.
- The processor speeds are automatically set for this server; therefore, you do not have to set any processor frequency-selection jumpers or switches.

The following illustration shows how to install the second processor on the system board for the blade server.



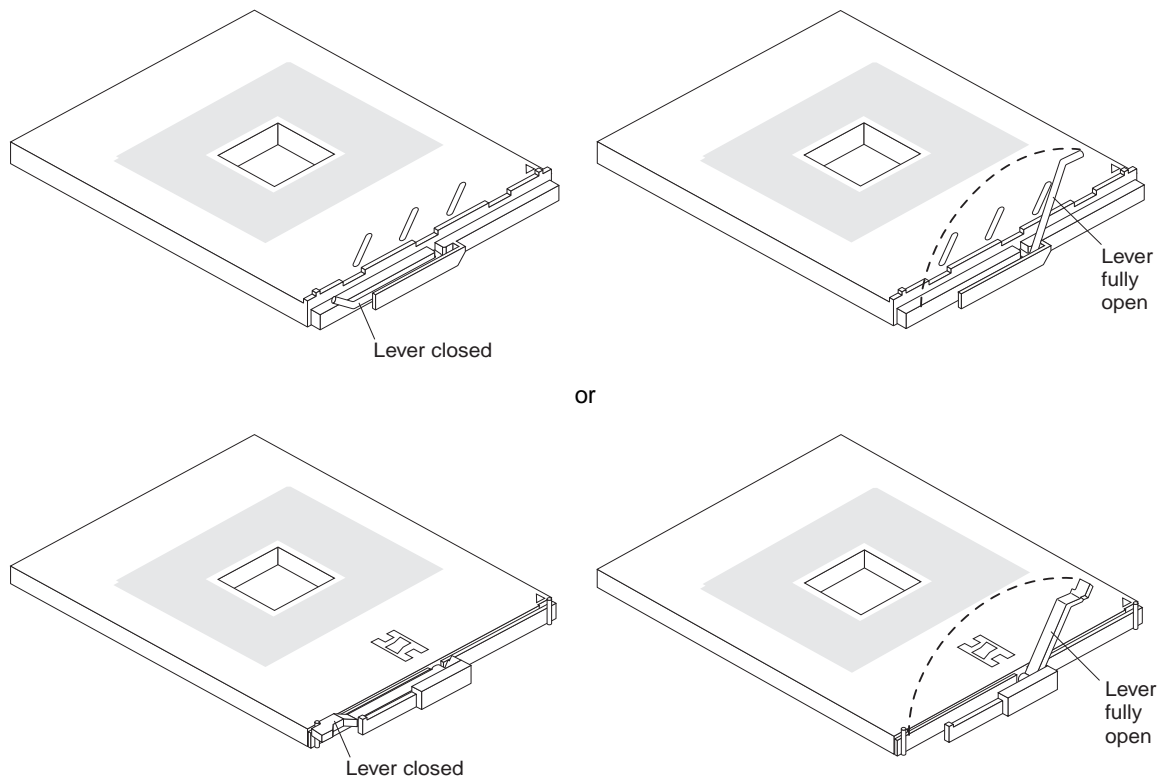
Complete the following steps to install an additional processor:

1. Read the safety information beginning on page vii and “Installation guidelines” on page 17.
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 19 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 20 for instructions).
5. Remove the bezel assembly (see “Removing the blade server bezel assembly” on page 21 for instructions).
6. Locate the processor socket on the system board.
7. Remove the heat-sink filler.
8. Install the processor:
  - a. Remove the protective cover, tape, or label from the surface of the processor socket, if one is present.
  - b. Touch the non-conductive package containing the new processor to any *unpainted* metal surface on the blade server or any *unpainted* metal surface on any other grounded rack component in the rack you are installing the processor in for at least 2 seconds; then remove the processor from the package.

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

- c. Rotate the locking lever on the processor 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 make sure that the locking lever on the processor socket is in the fully open position before you insert the processor in the socket. Failure to do so might result in permanent damage to the processor, processor socket, and system board.



or

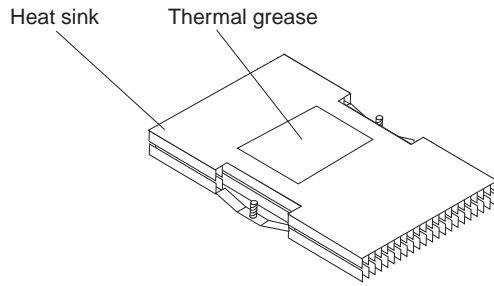
- d. Center the processor over the processor socket. Align the triangle on the corner of the processor with the triangle on the corner of the socket and carefully press the processor into the socket.
 

**Attention:**

    - Do not use excessive force when pressing the processor into the socket.
    - Make sure that the processor is oriented and aligned correctly in the socket before you try to close the lever.
  - e. Carefully close the lever to secure the processor in the socket.
9. Install a heat sink on the processor:

**Attention:**

- Do not set down the heat sink after you remove the plastic cover.
- 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 processor or heat sink becomes contaminated, contact your service technician.



- a. Remove the plastic protective cover from the bottom of the heat sink.
  - b. Align and place the heat sink on top of the processor 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. If you are using a torque wrench, tighten the screws to 8.5 to 13 Newton-meters (Nm) (6.3 to 9.6 foot-pounds).
10. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 41.

## Installing an I/O expansion card

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

### Attention:

When you add an expansion card, you must make sure that the I/O modules in I/O module bays 3 and 4 on the SBCE unit both support the 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 expansion card. All other expansion cards that are installed on other blade servers in the SBCE unit must also be compatible with these I/O 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 enable the use of several different types of compatible I/O expansion cards within the same unit.

### ⇒ Important

Installation of a standard form-factor expansion card can require removing the SCSI drive installed in SCSI connector 2 (J94). The standard form-factor expansion card occupies the same space as this SCSI drive and replaces it. You cannot have a SCSI drive in SCSI connector 2 when a standard form-factor expansion card is going to be installed. Refer to “Removing a SCSI hard disk drive” on page 22.

If the SCSI drive that is installed in SCSI connector 2 contains any information that you want to keep, back it up to another storage device.

If the SCSI hard disk drive that is installed in SCSI connector 2 is part of a RAID array, delete this SCSI RAID array configuration before removing the hard disk drive. When you delete the RAID array, the array configuration information is removed; no data is deleted.

There are two types of I/O expansion cards supported by the blade server:

- Gigabit Ethernet expansion card
- Fibre Channel expansion card

The Gigabit Ethernet and Fibre Channel expansion cards are available as a small form-factor card and a standard form-factor card.

The following sections describe how to install an I/O expansion card in the blade server.

⇒ **NOTE**

You cannot install both sizes of I/O expansion cards in the same blade server. You can install the small form-factor expansion card in addition to having two SCSI hard disk drives, but you cannot install a standard form-factor expansion card into a blade server with two SCSI hard disk drives.

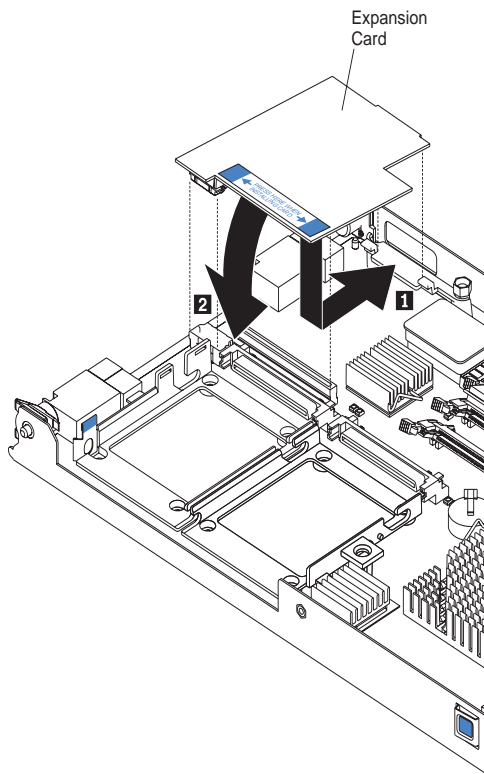
## **Installing a small form-factor expansion card**

The small form-factor expansion option is installed near SCSI connector 2.

Complete the following steps to install the small form-factor expansion card:

1. Read the safety information beginning on page vii and “Installation guidelines” on page 17.
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 19 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 20 for instructions).
5. Install the small form-factor I/O expansion card:

Figure 10. Installing a small form-factor I/O card in the blade server



- a. Orient the I/O expansion card as shown by number 1 in Figure 10.
  - b. Slide the notch at the narrow end of the card into the raised hook on the tray; then gently pivot the card into the expansion card connectors, as shown by number 2 the illustration.  
For device driver and configuration information to complete the installation of the expansion card, see the documentation for the expansion card.
6. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 41.

## Installing a standard form-factor expansion card

If a SCSI drive is connected to SCSI connector 0 (J94), you must remove it before you can install a standard form-factor expansion card. You cannot have both a drive that is connected to SCSI connector 0 and a standard form-factor expansion card installed into the blade server.

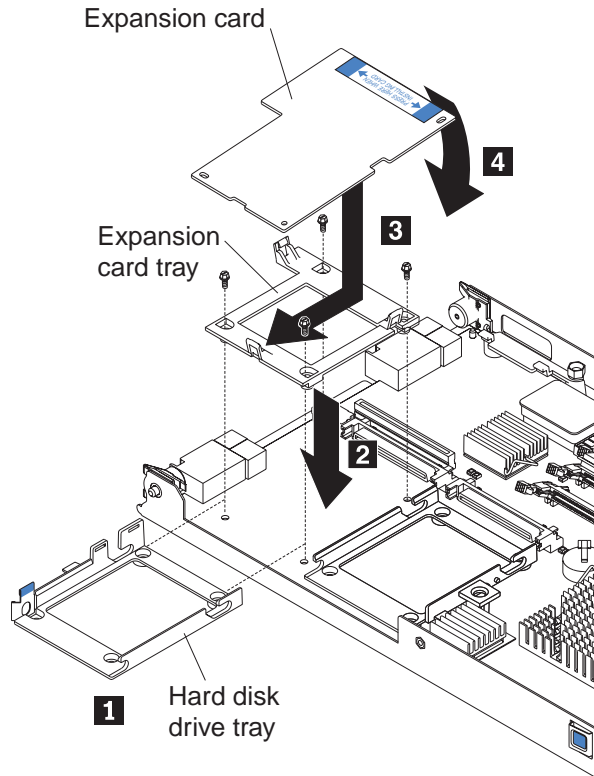
If the drive that is connected to SCSI connector 0 contains any information you want to keep, back up the information. If the SCSI drive that is installed in SCSI connector 0 is part of a RAID array, delete the SCSI RAID array. When you delete the array, the array configuration information is removed. No data is deleted. After backing up the data and removing the RAID array, see “Removing a SCSI hard disk drive” on page 22 to remove the drive.

Complete the following steps to install a standard form-factor I/O expansion card:

1. Read the safety information beginning on page vii and “Installation guidelines” on page 17.
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 19 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 20 for instructions).
5. If an SCSI drive is in SCSI connector 2, remove the drive and tray (see “Removing a SCSI hard disk drive” on page 22 for instructions) (save the screws that secured the tray to the system board); otherwise, remove the existing rear-board mounting screws (near SCSI connector 2).
6. Install the standard form-factor I/O expansion card:

*Figure 11. Installing a standard form-factor expansion card in the blade server*



- a. Install the expansion card tray. Secure the tray to the system board with the screws from the option kit, as shown Figure 11.
- b. Orient the expansion card and 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 expansion card connectors.

**NOTE**

For device driver and configuration information to complete the installation of the expansion card, see the documentation for the option.

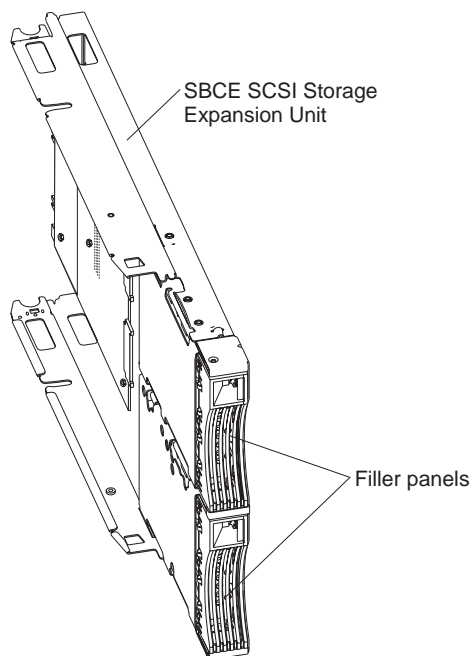
7. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 41.

# Installing the Intel® Blade Server SCSI Expansion Module SBESCSI

The Intel® Blade Server SCSI Expansion Module SBESCSI supports up to two hot-swap SCSI hard disk drives and up to two standard form-factor I/O cards or two small form-factor I/O cards.

To help ensure proper cooling and system reliability, make sure that:

- Each of the blade bays on the front of the SBCE unit has either a blade server or filler blade installed.
- A removed hot-swap blade server or filler blade is replaced within 1 minute of removal.
- 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.



**Attention:** Static electricity can damage electronic devices and your blade server. To avoid damage, keep static-sensitive devices in their non-conductive 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 damage it.
- While the device is still in its non-conductive package, touch it to an unpainted metal part of the SBCE chassis for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly on the blade server without setting the device down. If it is necessary to set down the device, place it back into its non-conductive package. Do not place the device on your SBCE chassis or on a metal surface.



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

## Installing a SCSI storage expansion unit

To use SCSI hard disk drives with your blade server, you must install the Intel® Blade Server SCSI Expansion Module SBESCSI on the blade server. You will then be able to install two 2.5-inch, hot-swap, SCSI, slim-high hard disk drives in the expansion unit. The SCSI storage expansion unit can contain up to two SCSI controllers that support embedded mirroring (RAID level-1) and embedded mirroring with striping (RAID-1E).

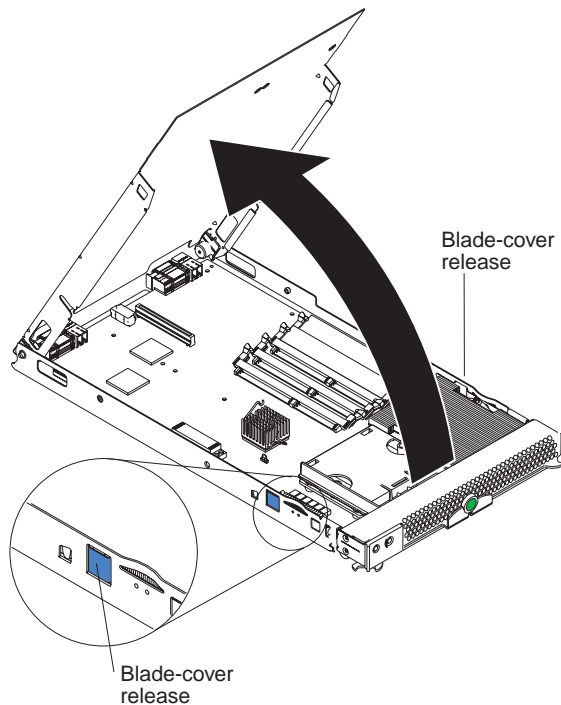
### ⇒ NOTE

After you install the SCSI storage expansion unit on your blade server, the blade server and expansion unit together occupy two blade bays in the SBCE unit.

For a list of SCSI hard disk drives supported by your blade server, see the *Tested Hardware and Operating System List (THOL)* on IBL.

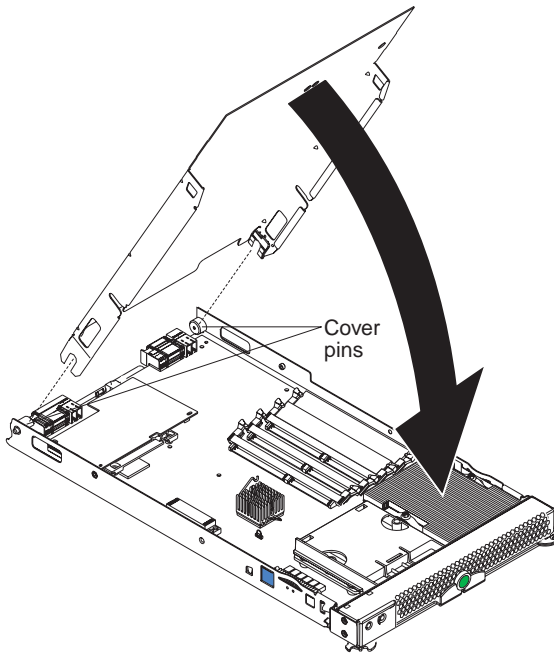
Complete the following steps to install the SCSI storage expansion unit:

1. Review the information in “Safety and regulatory information” on page vii and “Installation guidelines” on page 17.
2. Shut down the operating system, turn off the blade server, and remove the blade server from the SBCE unit.
3. Carefully lay the blade server on a flat, non-conductive surface.
4. Remove the blade server cover:
  - a. Open the blade server cover and lift it from the blade server.



- b. Store the cover in a safe place.

5. Locate the SCSI expansion connector (J132) on the system board and lift the protective film from the connector.



6. Install the SCSI storage expansion unit:
  - a. Touch the non-conductive package that contains the expansion unit to any unpainted metal surface on the SBCE chassis or any unpainted metal surface on another grounded rack component. Then remove the expansion unit from the package.
  - b. Orient the expansion unit as shown in the illustration.
  - c. Lower the expansion unit so that the slots at the rear slide down onto the pins at the rear of the blade server.
  - d. Pivot the 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 (J132) on the system board.

**Statement 21:**



**CAUTION:**

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

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

**NOTE**

When any blade server or option is in blade bay 7 through 14, power modules must be present in power bays 1, 2, 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.

With the expansion unit installed on your blade server, you can install up to two hot-swap SCSI hard disk drives in the expansion unit. Each SCSI device must have a unique SCSI ID. This ID enables the SCSI controller in the expansion unit 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 4 lists the SCSI IDs for the hard disk drives that are installed in the expansion unit. See “Installing a SCSI disk drive” on page 36 for instructions for installing hard disk drives.

SCSI hard disk drive 1 is in the top bay in the expansion unit; SCSI hard disk drive 2 is the bottom bay.

*Table 4. SCSI IDs for the hard disk drives in the expansion unit*

Device	SCSI ID
SCSI hard disk drive 1 (blade server)	0
SCSI hard disk drive 2 (blade server)	1
SCSI hard disk drive 1 (expansion unit)	2
SCSI hard disk drive 2 (expansion unit)	3

⇒ **NOTE**

You must have two SCSI drives to have a RAID-1 array or three SCSI drives to have a RAID-1E array.

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

Use the Configuration/Setup Utility program in the blade server to enable or disable the SCSI controller in the expansion unit. Use the LSI Logic Configuration Utility program to perform a low-level format on the hard disk drives, set the SCSI device scan order, or set the SCSI ID for the controller. The LSI Logic Configuration Utility program is part of the BIOS code on the SCSI storage expansion unit.

The expansion unit supports RAID-1E, which is an alternative to RAID-10. When the number of SCSI hard disk drives in a RAID-1E is even, the striping pattern is identical to RAID-10. Data for a given file may be written in stripe units to different drives in the array, rather than being written to a single drive. By using multiple drives, the array can provide higher data transfer rates and higher I/O rates when compared to a single large drive.

Embedded mirroring, which is also known as RAID level 1, is used when you have two hot-swap SCSI hard disk drives installed. Each drive is an exact copy of the other. Therefore, if either drive fails, no data is lost. When you replace a failed drive with another, the system automatically creates a mirror copy of the functional hard disk drive on the new hard disk drive.

See “Opening the SCSI storage expansion unit cover” on page 37 for information about starting and using the LSI configuration program.

## Installing a SCSI disk drive

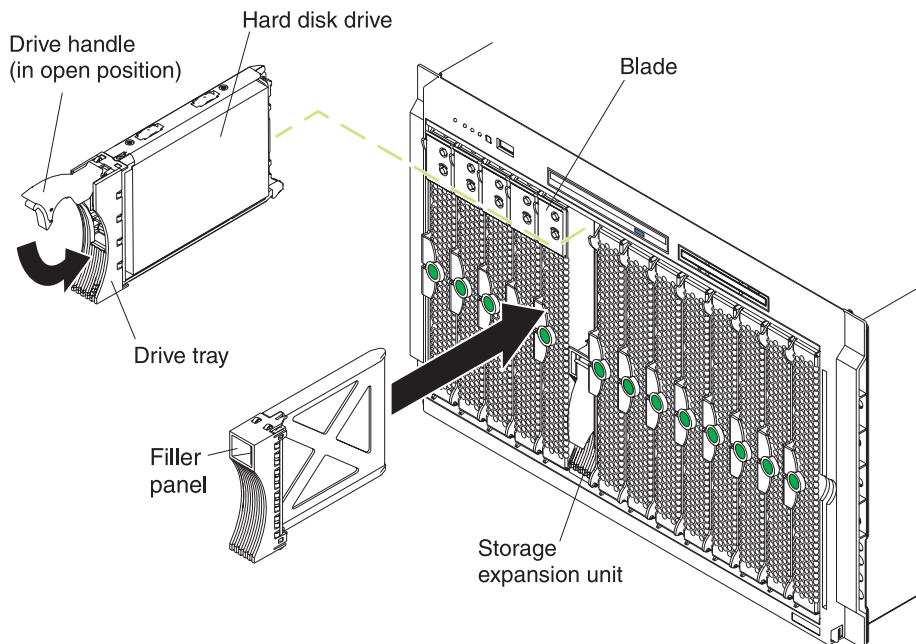
After you have installed the SCSI storage expansion unit on the blade server, you can install up to two SCSI disk drives in the expansion unit.

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

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

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



Complete the following steps to install a drive in the expansion unit.

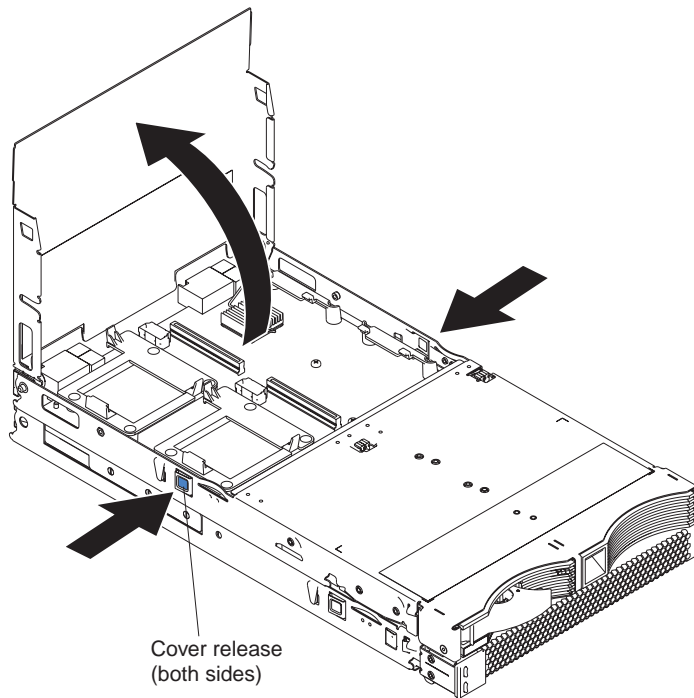
**Attention:** To maintain proper system cooling, do not operate the SBCE unit for more than 1 minute without either a drive or a filler panel installed in each expansion unit bay.

1. Review the information in “Safety and regulatory information” on page vii and “Installation guidelines” on page 17.
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 hard disk drive:
  - a. Ensure that the tray handle is open (that is, perpendicular to the drive).
  - b. Align the drive assembly with the guide rails in the bay.
  - c. Gently push the drive assembly into the bay until the drive 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 drive is lit continuously, that drive is faulty and must be replaced.
  - If the green hard disk drive activity LED is flashing, the drive is being accessed.

## Opening the SCSI storage expansion unit cover

The following illustration shows how to open the expansion unit cover.



Complete the following steps to open the expansion unit cover:

1. Read the safety information beginning on page “Installation guidelines” on page 17.
2. Carefully lay the expansion unit down on a flat, non-conductive surface, with the cover side up.
3. Press the unit-cover release on each side of the expansion unit and lift the cover open, as shown in the illustration.
4. Lay the cover flat, or lift it from the expansion unit and store for future use.

### Statement 21:



### CAUTION:

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

## Installing an I/O expansion card in the SCSI storage expansion unit

You can add optional I/O expansion cards to your expansion unit to give the unit additional connections for communicating on a network.

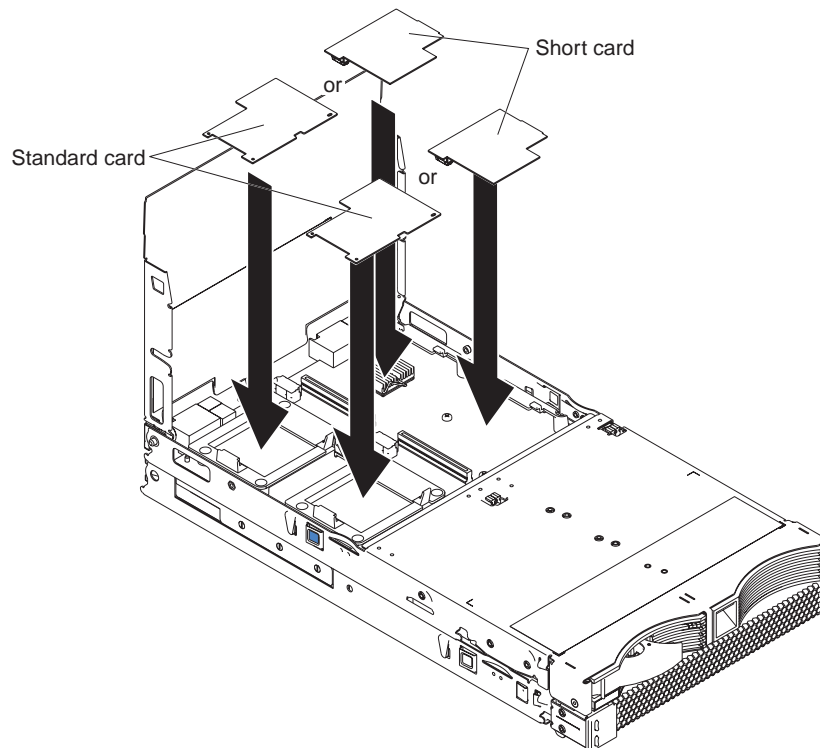
**Attention:** When you add an I/O expansion card, you must make sure that the I/O modules in I/O module bays 3 and 4 on the SBCE unit both support the I/O expansion card network-interface type.

The I/O expansion cards that are supported by the expansion unit are a standard form-factor and a small form-factor card. The Fibre Channel expansion card and the Gigabit Ethernet expansion card are available as small form-factor and standard form-factor I/O expansion cards.

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

1. Read the safety information beginning on page “Safety and regulatory information” on page vii and “Installation guidelines” on page 17.
2. Shut down the operating system, turn off the blade server, and remove the expansion unit from the SBCE unit (see “Installing a SCSI storage expansion unit” on page 33).
3. Carefully lay the expansion unit on a flat, non-conductive surface.
4. Open the cover (see “Opening the SCSI storage expansion unit cover” on page 37 for instructions).
5. Install the I/O expansion card:

*Figure 12. Installing an I/O expansion card in the expansion unit*



- a. Orient the I/O expansion card, as shown in Figure 12.

- b. 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 for the option.

6. If you have other options to install or remove, do so now.

## 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.

**Statement 2:**



**CAUTION:**

**When replacing the lithium battery, use only 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

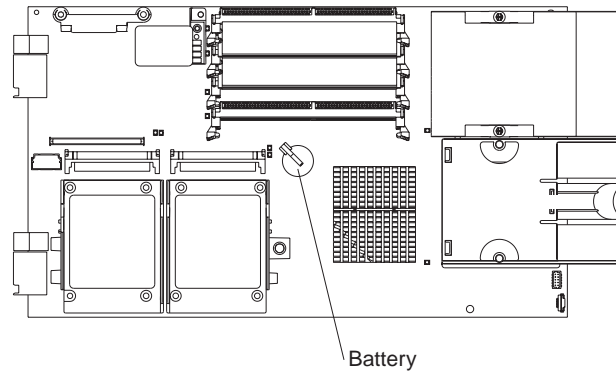
Dispose of the battery as required by local ordinances or regulations.

Complete the following steps to replace the battery:

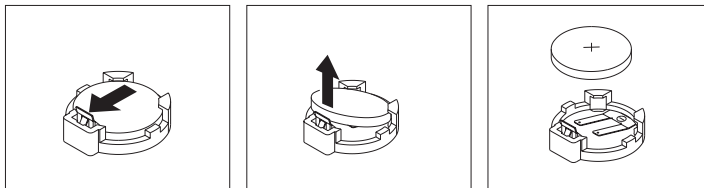
1. Read the safety information beginning on page vii and “Installation guidelines” on page 17.
2. Follow any special handling and installation instructions that came with the battery.
3. Turn off the blade server and remove it from the SBCE unit (see “Removing the blade server from the SBCE unit” on page 19 for instructions).
4. Open the blade server cover (see “Opening the blade server cover” on page 20 for instructions).

5. Locate the battery on the system board.

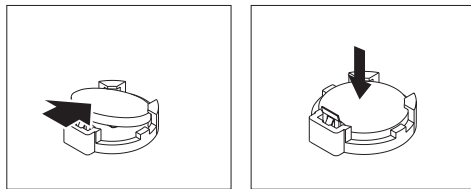
*Figure 13. Battery location*



6. To remove the battery, use your finger to press down on one side of the battery; Then slide the battery from the socket. The spring mechanism will push the battery out towards you as you slide it from the socket.



7. Insert the new battery:
  - a. Tilt the battery so that you can insert it into the socket.
  - b. As you slide the battery into place, press the battery down into the socket.





8. Close the blade server cover (see “Closing the blade server cover” on page 43).

**Statement 21:**



**CAUTION:**

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

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 53 for information).

## Completing the installation

To complete the installation, complete 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 an expansion unit option (see “Closing the blade server cover” on page 43).

**Statement 21:**



**CAUTION:**

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

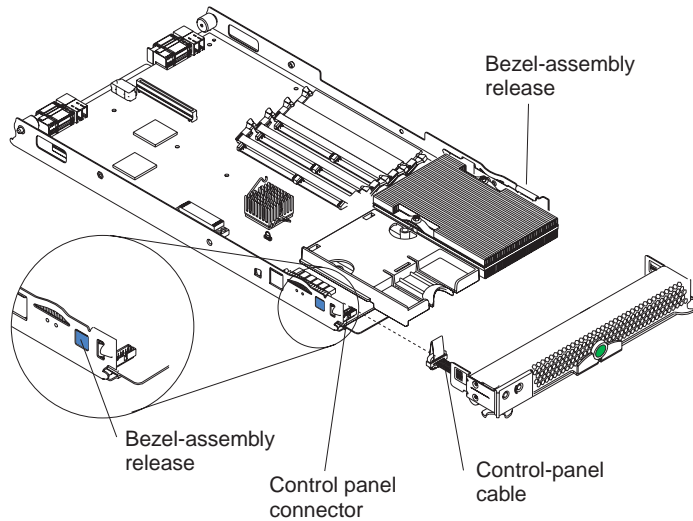
3. Reinstall the blade server into the SBCE unit (see “Installing the blade server in the SBCE unit” on page 44).
4. Turn on the blade server (see “Turning on the blade server” on page 9).
5. For certain options, run the blade server Configuration/Setup Utility program (see “Updating your blade server configuration” on page 45).

**NOTE**

If you have just connected the power cords of your SBCE unit to electrical outlets, you must 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.



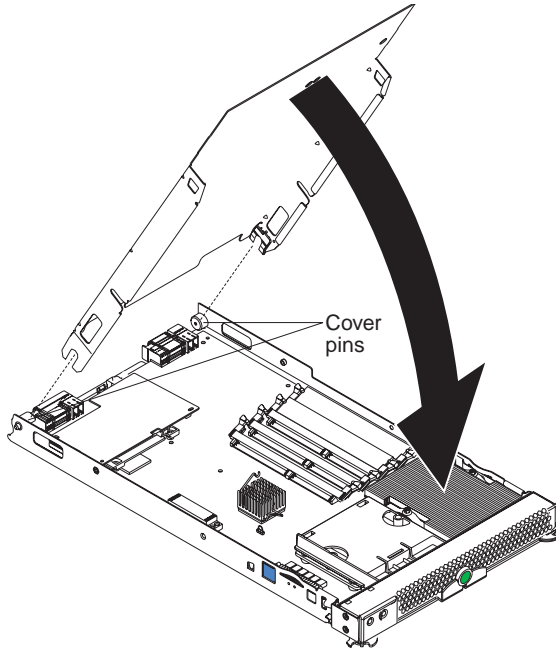
Complete the following steps to install the blade server bezel assembly:

1. Read the safety information beginning on page vii and “Installation guidelines” on page 17.
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 an expansion unit is installed. Do not attempt to override this protection.

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

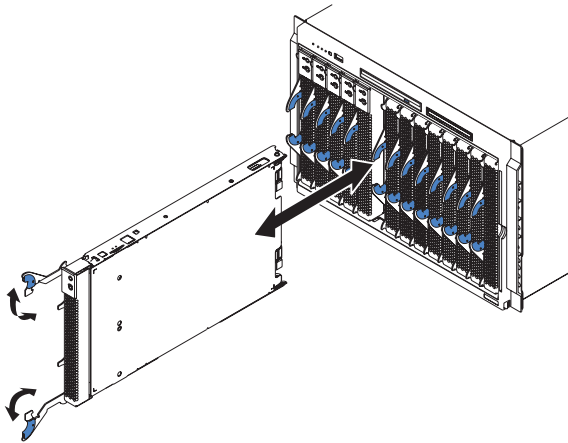


Complete the following steps to close the blade server cover:

1. Read the safety information beginning on page vii and “Installation guidelines” on page 17.
2. If you removed the blade bezel assembly, replace it now (see “Installing the blade server bezel assembly” on page 42 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

The following illustration shows how to install the blade server into the SBCE unit.



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

### Statement 21:



### CAUTION:

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

1. Read the safety information beginning on page vii and “Installation guidelines” on page 17 through “Handling static-sensitive devices” on page 17.
2. If you have not done so already, install any options that you want, such as SCSI drives or memory, in the blade server.
3. Select the bay for the blade server.

### Notes:

- a. If the blade server has an expansion unit installed on it, the blade server and expansion option require two adjacent bays.
  - b. When any blade server or option is in either blade bay 7 through 14 in the SBCE unit, power modules must be present in all four power bays.
  - 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 system unit without either a blade server, expansion unit, or filler blade installed in each blade bay for more than 1 minute for the SBCE unit.
4. Make sure 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 farther 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 9 for instructions).
8. Make sure 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. (Optional) Write identifying information on one of the user labels that come with the blade servers and place the label on the SBCE unit bezel.

Refer to Figure 2 on page 3 for information about the label placement.

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

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

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

If this is the initial installation for a blade server in the SBCE unit, you must configure the blade server with the Configuration/Setup Utility and install the blade server operating system. See “Updating your blade server configuration” on page 45 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), a message might be displayed informing 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 53 for more information about the Configuration/Setup Utility program.

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

Your blade server comes with one or two processors installed on the system board. If your blade server comes with two processors, or if your blade server comes with one processor and you have installed an additional processor, your blade server can now operate as an SMP server. Therefore, you might have to upgrade your operating system to support SMP. See your operating-system documentation for additional information.



## 4 Field replaceable units

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This chapter describes the removal of field-replaceable server components.

### Microprocessor removal

This section includes the guidelines to follow and the instructions for removing a microprocessor.

#### Removal Guidelines

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

**Attention:** Do *not* use a thermal grease syringe with this FRU.

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

1. Carefully handle the heat sink and microprocessor when removing or installing these components. Do not touch the grease or otherwise allow it to become contaminated.
2. For dual-microprocessor systems, since the microprocessor and the heat sink are a matched set, first transfer the heat sink and microprocessor from one socket to the new system board; then, transfer the other heat sink and microprocessor. (This will ensure that the grease remains evenly distributed between each heat sink and microprocessor.)

#### Notes:

- The heat sink FRU is packaged with the thermal grease applied to the underside. This thermal grease is not available as a separate FRU. The heat sink must be replaced when new grease is required, such as when a defective microprocessor is replaced or if the grease is contaminated.
- If you need to install a new heat sink for any reason, first remove the thermal grease from the microprocessor with an alcohol pad before attaching the new heat sink.
- A heat sink FRU can be ordered separately if the grease becomes contaminated.

#### Removal procedure

Complete the following steps to remove a microprocessor:

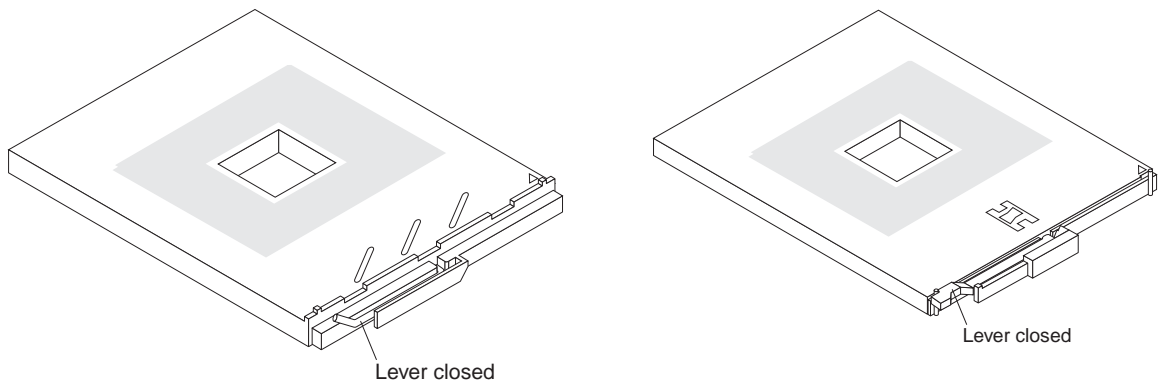
- Read “Installation guidelines” on page 17.
  - Read the safety notices at “Safety and regulatory information” on page vii.
  - Read “Handling static-sensitive devices” on page 17.
1. Shut down the operating system, turn off the blade server, and remove the blade server from the SBCE unit (see “Removing the blade server from the SBCE unit” on page 19).
  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 20 for instructions).
  4. Remove the bezel assembly (see “Removing the blade server bezel assembly” on page 21 for instructions).
  5. Identify the microprocessor to be removed.

#### ⇒ NOTE

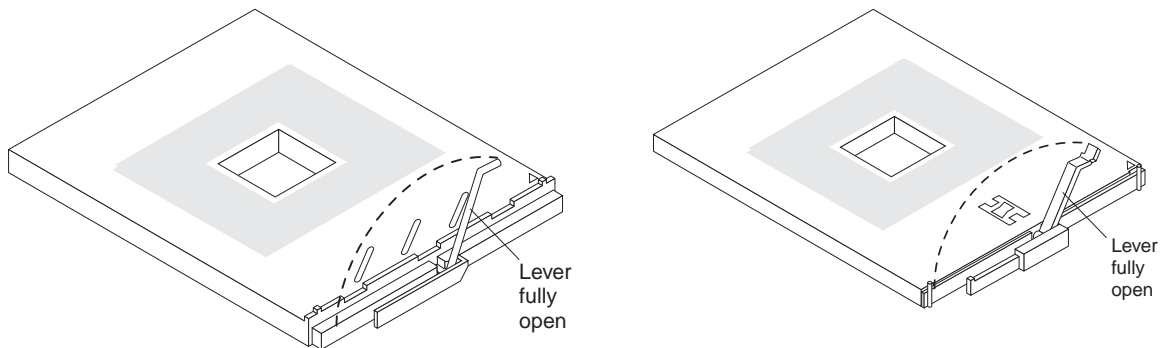
If you are replacing a failed microprocessor, verify that you have selected the correct microprocessor for replacement (see “Light Path Diagnostics” on page 108).

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 (Figure 14) until it stops or clicks in the fully open position (approximately 135° angle), as shown in Figure 15.



*Figure 14. Microprocessor locking lever in the closed position*



*Figure 15. Microprocessor locking lever in the fully open position*

**Attention:** You must ensure that the locking lever on the microprocessor socket is in the fully open position before you remove the microprocessor from or insert the microprocessor into 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.



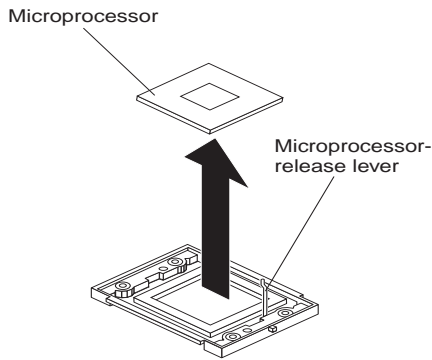


Figure 16. Removing the microprocessor

To install a microprocessor, see “Installing an additional processor” on page 25 and the documentation provided with the microprocessor option for complete installation instructions.

**Attention:** If you are not installing a replacement microprocessor in socket 2, you must reinstall the microprocessor heat sink filler in that socket.

## System board assembly

This section shows the locations of items on the system board and describes how to replace the system board assembly.

### System board component locations

Figure 17 shows the location of the battery and of system board component connectors.

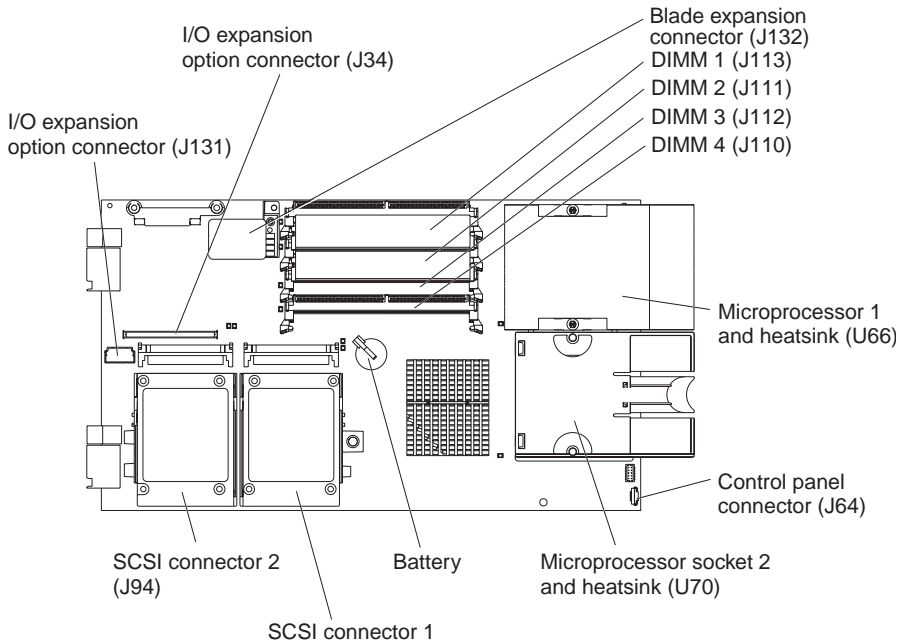


Figure 17. System board component locations

## Switches

Figure 18 shows the location of the system board switch-block (SW2).

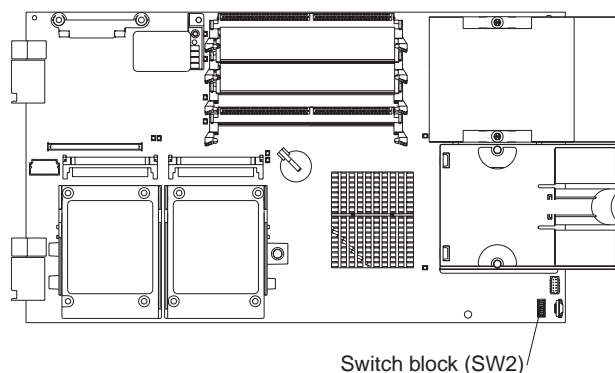


Figure 18. System board switch block (SW2) location

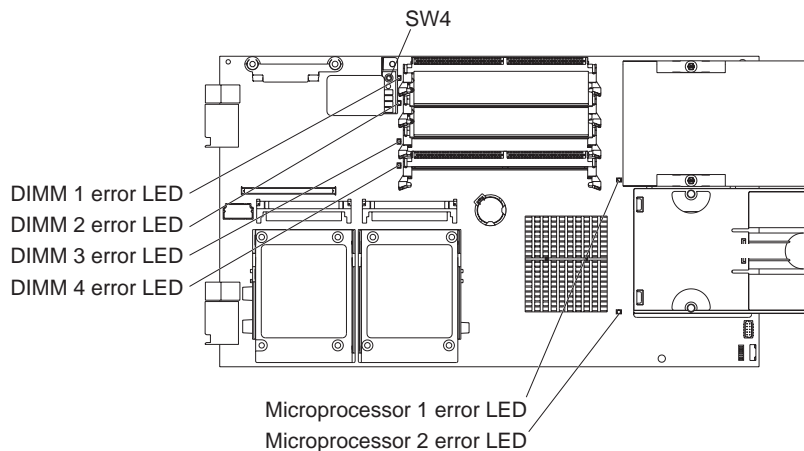
The following table describes the function of each switch on switch block SW2.

Table 5. Switch block (SW2)

Switch number	Default value	Switch description
1	Off	BIOS backup page jumper. <ul style="list-style-type: none"> <li>On – boots the blade server from the backup BIOS page</li> <li>Off – boots the blade server from the primary BIOS page</li> </ul>
2	On	Wake on LAN (WOL) bypass. <ul style="list-style-type: none"> <li>On – disables the bypass</li> <li>Off – enables the bypass</li> </ul>
3	—	Reserved.
4	Off	Power-on override. <ul style="list-style-type: none"> <li>On – forces the blade server to turn on, overriding the power-on button (should be used for debug purposes only)</li> <li>Off – normal operation</li> </ul>
5	—	Reserved.
6	Off	Clear CMOS. <ul style="list-style-type: none"> <li>On – clears the CMOS</li> <li>Off – normal operation</li> </ul>
7	—	Reserved
8	Off	Power-on password override. <ul style="list-style-type: none"> <li>On – enables the power-on password override (see “Using passwords” on page 56 for additional information about the power-on password)</li> <li>Off – disables the power-on password override</li> </ul>

## System board LED locations

Figure 19 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 have to remove the blade server from the SBCE unit, open the cover, and press the light path diagnostics button (SW4) to light any error LEDs that were turned on during processing.



*Figure 19. System board LED location*

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.

## System board replacement

When replacing the system board, you will replace the system board and blade base as one assembly. After replacement, 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.

- Read “Installation guidelines” on page 17.
- Read the safety notices at “Safety and regulatory information” on page vii.
- Read “Handling static-sensitive devices” on page 17.

Complete the following steps to replace the system board assembly:

1. Shut down the operating system and turn off the blade server (see “Turning off the blade server” on page 10).
2. Remove the blade server from the SBCE (see “Removing the blade server from the SBCE unit” on page 19).
3. Remove the blade server cover (see “Opening the blade server cover” on page 20) or expansion unit.
4. Remove the blade server bezel assembly (see “Removing the blade server bezel assembly” on page 21).

5. Remove any of the installed components listed below from the system board assembly; then, place them on a static-protective surface or install them on the new system board assembly.
  - I/O expansion cards (reverse the steps in “Installing an I/O expansion card” on page 28)
  - Hard disk drives (see “Removing a SCSI hard disk drive” on page 22)
  - Microprocessors/heat sinks (see “Microprocessor removal” on page 47)
  - DIMMs (reverse the steps in “Installing memory modules” on page 23)
  - Battery (see “Replacing the battery” on page 39)

Reverse these steps to install the components on the replacement system board assembly.

## 5 Configuring the blade server

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The following configuration programs come 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.

- **LSI Logic Configuration Utility program**

The LSI Logic Configuration Utility program is part of the basic input/output system (BIOS) code in the blade server. Use it to set the device scan order and to set the SCSI controller IDs. See “Using the LSI Logic Configuration Utility program” on page 60 for more information.

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

The PXE boot agent utility program is part of the BIOS code in the blade server. Use it to select the boot protocol and other boot options and to select a power management option. For information about using this utility, see “Using the PXE boot agent utility program” on page 57.

### Using the Configuration/Setup Utility program

This section provides the instructions for starting 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. Select the settings to view or change.

#### 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 processors 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.

- **Processor Summary**

Select this choice to view information about the processors installed in the blade server.

- **USB Device Summary**

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

- **System Information**

Select this choice to display information about the 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.

- **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.

You can also enable or disable the integrated SCSI and Ethernet controllers and all standard ports (such as serial and parallel). **Enable** is the default setting for all controllers. If you disable a device, it cannot be configured, and the operating system will not be able to detect it (this is equivalent to disconnecting the device.)

- **Remote Console Redirection**

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

- **Video**

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

- **System MAC Addresses**

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

- **Date and Time**

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

- **System Security**

Select this choice to set a power-on password. See “Using passwords” on page 56 for more information about the password.

- **Start Options**

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

- **Start Sequence Options**

Select this choice to view the startup device sequence that is set for the 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 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 PXE option for either of the integrated Gigabit Ethernet controllers. The default setting for this menu item is **Planar Ethernet 1**, which enables the PXE option for the first Ethernet controller on the system board.

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.

This choice is on the full Configuration/Setup menu only.

- **Advanced Setup**

Select this choice to change settings for advanced hardware features.

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

- **Memory Settings**

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

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

To maintain optimum system operation in the event of a memory failure, you can set the **Memory Configuration** for memory **Mirroring** or **Sparing**. Memory mirroring stores duplicate data on two DIMMs to prevent data loss if a DIMM fails. Memory sparing removes the failed memory from the system configuration and activates a Hot Spare Memory pair of DIMMs to replace the failed pair of DIMMs. Before you can enable memory mirroring or sparing, at least two pairs of DIMMs must be installed in the blade server. These pairs must adhere to the special requirements described in “Installing memory modules” on page 23.

- **CPU Options**

Select this choice to disable the processor cache or to set the processor cache to use the write-back or the write-through method. Write-back caching generally provides better system performance

You can also select this choice to enable or disable hyper-threading and adjust the processor performance settings. If enabled, hyper-threading will only be active if it is supported by the operating system.

- **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.

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

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

- **BMC Network Configuration**

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

- **BMC System Event Log**

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

— **System Partition Visibility**

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

— **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 nonmaskable interrupt (NMI) to the blade server.

- **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.

If you set a power-on password, you must type the power-on password to complete the system startup and to have access to the 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 and then reinstall it (see “Replacing the battery” on page 39).
- 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 have to move the switch back to the previous position after the password is overridden. See Figure 4 on page 14 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 a power-management option

⇒ **NOTE**

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

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`. You have 2 seconds (by default) to press `Ctrl+S` after the prompt appears.

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

3. Use the arrow keys or press `Enter` to select a choice from the menu.
  - 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 that you can use to install these firmware updates.

⇒ **Important**

To avoid problems and to maintain proper system performance, always make sure 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	Intel® Deployment Manager by Veritas OpForce™
Blade server BIOS code	Yes	No	No	No	Yes
Blade server diagnostic code	Yes	No	No	No	Yes
Blade server service processor code	Yes	Yes	No	No	Yes

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 have to flash the service processor to apply the latest firmware. Download the latest firmware for your blade server service processor from the Intel Support Web site. Use the management-module Web interface to flash the service processor. The Web interface is described in the *Intel® Server Management Module SBCECM: Installation and User's Guide*.

## 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 59 for information about how to determine the routing from Ethernet controller to I/O module bay for your blade server.

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

Your Ethernet controllers support failover, which provides automatic redundancy for your Ethernet controllers. Without failover, you can have only one Ethernet controller from each server attached to each virtual LAN or subnet. With failover, you can configure more than one Ethernet controller from each server to attach to the same virtual LAN or subnet. Either one of the integrated Ethernet controllers can be configured as the primary Ethernet controller. If you have configured the controllers for failover and the primary link fails, the secondary controller takes over. When the primary link is restored, the Ethernet traffic switches back to the primary Ethernet controller. (See your operating system device driver documentation for information about configuring for failover.)

**Important:** To support failover on the blade server Ethernet controllers, the Ethernet switch modules in the 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 or pass-thru module in I/O-module bay 1.
2. Make sure that the ports on the switch module or pass-thru module are enabled (**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 that 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 that you enabled is associated with the switch module in I/O-module bay 1. The other Ethernet controller in the blade server is associated with the switch module in I/O-module bay 2.

If you have installed an expansion card on a blade server, communications from the option are routed to I/O-module bays 3 and 4. You can verify which controller on the card is routed to which I/O-module bay by performing this test, using a controller on the expansion card and a compatible switch module or pass-thru module in I/O-module bay 3 or 4.

## Configuring a SCSI RAID array

Configuring an SCSI RAID array applies to a blade server in which two SCSI hard disk drives are installed. You can also configure a SCSI RAID array when you have a SCSI expansion unit in which SCSI drives are installed. If you installed an expansion unit with SCSI drives installed into it, those drives can become a part of the blade server RAID array. The expansion unit supports RAID level 1 (embedded mirroring) and RAID level 1E.

Two SCSI hard disk drives in the blade server can be used to implement and manage RAID level-1 (mirror) arrays. For your blade server, you must configure the SCSI RAID using the LSI Configuration Utility program.

### ⇒ **Important**

Depending on your RAID configuration, you must create the RAID array *before* you install the operating system on your blade server.

## Using the LSI Logic Configuration Utility program

You can use the LSI Logic Configuration Utility to:

- Set the SCSI device scan order
- Set the SCSI ID for the controller

Complete the following steps to start the LSI configuration utility program:

1. Turn on the blade server (make sure the blade server is the owner of the keyboard, video, and mouse) and watch the monitor screen.
2. When the <<<Press Ctrl-C to start LSI Configuration Logic Utility>>> prompt appears, press Ctrl-C.
3. Use the arrow keys to select the controller (channel) from the list of adapters; then press Enter.
4. Follow the instructions on the resulting screen to change the settings of the selected items; then press Enter. If you select **Device Properties** and **Mirroring Properties**, additional screens are displayed.

## 6 Diagnostics

---

This section provides basic troubleshooting information to help you solve some common problems that might occur with the 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 131 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 the 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 102.
3. If the blade server stops and no error is displayed, go to “Undetermined problems” on page 126.
4. For safety information, see “Safety and regulatory information” on page vii.
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 126.
7. If device errors occur, see “Error symptoms” on page 110.

#### **| 001 |** 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 102.
7. Check the information LED panel Blade-error LED; if it is on, see “Light Path Diagnostics” on page 108.
8. Check the system-error log. If an error was recorded by the system, see Chapter 8, “Symptom-to-FRU index,” on page 95.
9. Start the diagnostic programs.
10. Check for the following responses:
  - One beep.
  - Readable instructions or the main menu.

#### **| 002 |** DID YOU RECEIVE BOTH OF THE CORRECT RESPONSES?

**NO.** Find the failure symptom in Chapter 8, “Symptom-to-FRU index,” on page 95.

**YES.** Run the diagnostic programs. If you receive an error, see Chapter 8, “Symptom-to-FRU index,” on page 95. If the diagnostic programs completed successfully and you still suspect a problem, see “Undetermined problems” on page 126.

## 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 (POST) 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 95 for more information.
- **Error symptom charts**  
These charts list problem symptoms and steps to correct the problems. See “Error symptoms” on page 65 for more information.
- **Diagnostic programs and error messages**  
Real Time Diagnostics tests the major components of the SBCE unit, including the management modules, switch modules, CD-ROM drive, diskette drive, and the blade servers, while the operating system is running.
- **Light path diagnostics feature**  
Use the light path diagnostics feature to identify system errors quickly. See the “Light Path Diagnostics” on page 108 for more information.

## POST

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 the operating system or application program appears.

## POST error logs

If POST detects a problem, more than one beep sounds, and an error message appears on the screen. See “Beep symptoms” on page 95 and “POST error codes” on page 102 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 53 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 the 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.

Error codes that might be displayed are listed at “Diagnostic error codes” on page 99.

The diagnostic text message format is as follows:

```
result test_specific_string
```

where:

**result** is one of the following results:

**Passed**

This test was completed without any errors.

**Failed**

This test discovered an error.

**User Aborted**

You stopped the test before it was completed.

**Not Applicable**

You attempted to test a device that is not present in the computer.

**Aborted**

The test could not proceed because of the computer configuration.

**Warning**

A possible problem was reported during the test (for example, a hardware problem that is not related to the hardware currently being tested).

**test\_specific\_string**

is an error code or other information about the error.

## 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 unit 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 99

⇒ **Notes:**

1. Depending on the 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 the 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 110).

If you cannot find the problem in the error symptom charts, go to “Starting the diagnostic programs” on page 63 to test the blade server.

## Small computer system interface messages

This information only applies if a storage expansion unit is available. If you receive a SCSI error message when running the SCSI Select Utility program, see “SCSI error codes” on page 122.

⇒ **NOTE**

If the server does not have a hard disk drive, ignore any message that indicates that the BIOS is not installed.

## Light Path Diagnostics

If the blade-error LED on the control panel of the blade server is lit, then one or more error LEDs for blade server components might also be on (see Figure 20). These LEDs help identify the cause of the problem.

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

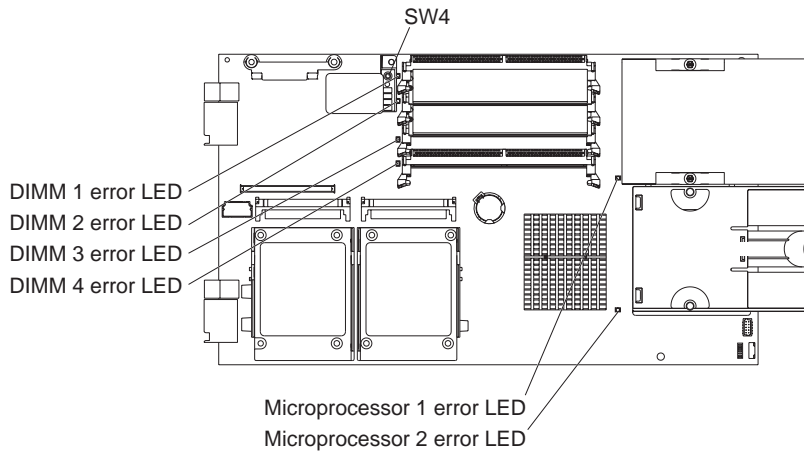


Figure 20. System board LED locations

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, static-protective 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 65 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 23.

## Recovering the BIOS code

The flash memory (BIOS) of the server consists of a primary page and a backup page. If the primary BIOS page is corrupt, the system must boot from the backup page and the primary page must be reflashed. In most instances, the switch to the backup page is handled by the automatic BIOS recovery feature (see “Automatic BIOS recovery”). If this feature cannot switch to the backup page, you must use the backup page jumper (see “Backup page jumper” on page 67).

### — NOTE

A BIOS flash diskette is required to perform these procedures. If you do not have a BIOS flash diskette, you can download an image for it from the World Wide Web. Go to <http://www.intel.com/ibl> and make the selections for your server.

## Automatic BIOS recovery

If the primary BIOS page is corrupt, the Baseboard Management Controller (BMC) will invoke the automatic BIOS recovery and switch the system to the backup page. When this occurs, you must use the BIOS flash utility and a BIOS flash diskette to flash the primary BIOS page and reboot the system. Once you have completed the flash, the automatic BIOS recovery feature will be reset to boot from the primary page.

Use one of the following methods to flash the primary BIOS page and switch the automatic recovery feature back to the primary page:

- For the DOS-based utility, insert the BIOS flash diskette in the diskette drive; then,
  - in unattended mode, enter: `flash2 /u /r` (the BIOS will be updated and the system will reboot).
  - in attended mode, manually reboot the system (the system will boot from the floppy) and follow the instructions on the screen.
- For Windows- and Linux-based flash utilities (WFlash and LFlash), run the utility using the "Reboot" option (see the on-line help for each utility for more information).

If you have to manually reset the automatic BIOS recovery feature after you have updated the primary BIOS image, complete the following steps:

1. Manually reboot the system.
2. When the message `F3 Reset BIOS Recovery` appears, press F3. The system will reset and attempt to boot from the primary BIOS image.

## Backup page jumper

If the BIOS code has become damaged and the automatic BIOS recovery fails, 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 the BIOS code using the BIOS backup page jumper (switch block SW2, switch 1) and a BIOS flash diskette.

The backup page 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 19).
3. Remove the cover (see “Opening the blade server cover” on page 20).

4. Locate switch block SW2 on the system board (see Figure 21).

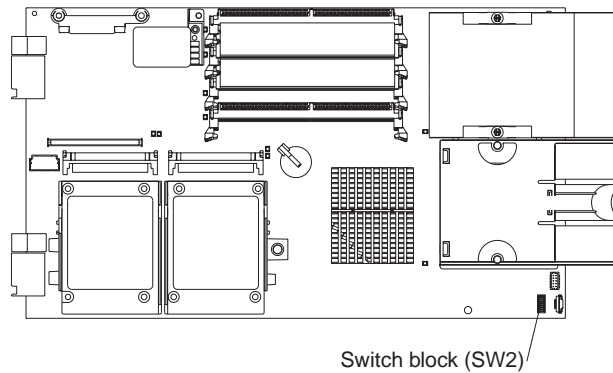


Figure 21. System board: BIOS backup page jumper

5. Move switch 1 (BIOS backup page jumper) to the ON position 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 **Update the BIOS**.  
**Attention:** Do not restart the blade server at this time.
13. Remove the flash diskette from the diskette drive.
14. Turn off the blade server, remove it from the SBCE unit, and remove the cover of the blade server.
15. Move switch 1 on switch block SW2 to the OFF position 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.

# 7 BIOS, Diagnostics and Firmware update procedures

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This section describes the usage of system update procedures for BIOS, diagnostics, and firmware updates.

## Updating the BIOS

Use the following procedure to update the BIOS for the Intel® Server Compute Blade SBX82:

1. Obtain the latest BIOS flash image from the most current Intel® Server Compute Blade SBX82 firmware release package. The firmware package may be found on the web at <http://www.intel.com/ibl> or <http://support.intel.com/support/motherboards/server/blade.htm>. If the firmware is unavailable, please contact your Intel support representative.
2. The firmware image files are self-extracting images and will extract to a floppy diskette. Extract the BIOS files to a floppy diskette. Depending upon the BIOS flash version, you may be required to accept a licensing agreement in order to extract the files.
3. After extracting the files to the floppy diskette, insert the "SBX82 BIOS Flash Disk" into drive A.
4. Boot up or restart the blade server that is to be updated.
5. The system will boot and present a window that allows for the selection of various flash or update options. Choose "1-Update POST/BIOS."
6. You will be asked if you would like to move the current POST/BIOS image to the backup ROM location. If you select "Y", the current code will be flashed into the backup bank immediately.
7. If the current system POST/BIOS supports the Serial Number feature, you will be asked if you would like to change it. If you select "Y", you will be able to enter a new number.
8. If the current system POST/BIOS supports the Product Code feature, you will be asked if you would like to change it. If you select "Y", you will be able to enter a new product code.
9. If the current system POST/BIOS supports the Asset Tag feature, you will be asked if you would like to change it. If you select "Y", you will be able to enter a new number.
10. You will then be asked if you would like to save the current code to a disk. If you select "Y", you need to have a formatted disk already available, or specify a fully qualified path and filename.
11. At this point, to continue with the POST/BIOS update, select "1 - Update POST/BIOS" from the menu displayed. To exit without updating the POST/BIOS, select option 0 to quit the flash update on this menu.
12. The system will update the flash ROM with the new code. When this is complete, you will be prompted to remove the disk from the drive and press enter to reboot the system.
13. Once the system has restarted, confirm the version change by checking the BIOS revision shown under the "Firmware VPD" tab in the Management Module web interface. See the "Firmware VPD" section in the Management Module User's Guide for additional information.

## Updating the Diagnostics

Use the following procedure to update the diagnostics for the Intel® Server Compute Blade SBX82:

1. Obtain the latest BIOS flash image from the most current Intel® Server Compute Blade SBX82 firmware release package. The firmware package may be found on the web at <http://www.intel.com/ibl> or <http://support.intel.com/support/motherboards/server/blade.htm>. If the firmware is unavailable, please contact your Intel support representative.
2. The firmware image files are self-extracting images and will extract to a floppy diskette. Extract the BIOS files to a floppy diskette. Extract the diagnostics files to two floppy diskettes. Depending upon the BIOS flash version, you may be required to accept a licensing agreement in order to extract the files.
3. After extracting the files to the floppy diskette, insert the "SBX82 BIOS Flash Disk" into drive A.
4. Boot up or restart the blade server that is to be updated.
5. The system will boot from the diskette and present a window that allows for the selection of various flash or update options. Choose "2-Update Diagnostic."
6. The system will prompt you to enter the first diskette containing the diagnostic code. Insert the "Diagnostics Flash Update Diskette 1 of 2" diskette into drive A and select "enter".
7. After loading the image from the first diskette, the system will prompt you to insert the second diskette containing the diagnostic code. Insert the "Diagnostics Flash Update Diskette 2 of 2" diskette into drive A and select "enter".
8. After the second image is loaded from the diskette, the system will ask you to wait while the images are flashed into ROM. When this is complete, you will be prompted to remove the diskette and select "enter" to restart the system.
9. Once the system has restarted, confirm the version change by checking the Diagnostics revision shown under the "Firmware VPD" tab in the Management Module web interface. See the "Firmware VPD" section in the Management Module User's Guide for additional information.

## Updating the BMC and SDR

Use the following procedure to update the BMC and SDR for the Intel® Server Compute Blade SBX82:

1. Obtain the latest BIOS flash image from the most current Intel® Server Compute Blade SBX82 firmware release package. The firmware package may be found on the web at <http://www.intel.com/ibl> or <http://support.intel.com/support/motherboards/server/blade.htm>. If the firmware is unavailable, please contact your Intel support representative.
2. The firmware image files are self-extracting images and will extract to a floppy diskette. Extract the BMC files to a floppy diskette. Depending upon the BIOS flash version, you may be required to accept a licensing agreement in order to extract the files.
3. After extracting the files to the floppy diskette, insert the "SBX82 BMC Flash Disk" into drive A.
4. Boot up or restart the blade server that is to be updated.
5. The system will boot and display a message that states "RAM Drive Created".
6. Immediately following the creation of the RAM drive, the system will detect the current firmware and image version. The message displayed will be "Firmware and image version detection".

7. At the next user prompt, the system will display "Start to program flash? (Y/N)". Select "Y" to program the BMC and SDR.
8. At this point, the system will flash and initialize the BMC. The SDR will also be automatically updated.
9. Following completion of the BMC and SDR update, the system will display "BMC firmware and SDRs updated successfully". Ensure that this message is displayed before proceeding.
10. Finally, you will be prompted to remove the disk from the drive and manually reboot the system.
11. Once the system has restarted, confirm the version change by checking the Blade System Management Processor revision shown under the "Firmware VPD" tab in the Management Module web interface. See the "Firmware VPD" section in the Management Module User's Guide.
12. It is also possible to flash the BMC via the Management Module web interface. See the firmware update procedures in the Management Module User's Guide.

## Online (OS Present) BIOS Update

The Microsoft\* Windows\* online flash utility (`wflash`) and the Linux online flash utility (`lflash`) update the BIOS while the Intel® Server Compute Blade SBX82 is running either a Windows or a Linux operating system.

## BIOS Update from Windows Operating System

The Intel® Server Compute Blade SBX82 Windows Update Package includes the `wflash.exe` file, the data files for the firmware being flashed and all files needed to create a DOS flash diskette. The following are supported Windows operating systems for the `wflash` utility:

- Microsoft\* Windows Server 2003, Standard Edition
- Microsoft\* Windows\* Server 2003, Enterprise Edition
- Microsoft\* Windows\* 2000 Advanced Server with Service Pack 4 or later
- Microsoft\* Windows\* 2000 Server with Service Pack 4 or later

## GUI operation

When run without parameters, `wflash.exe` allows the user to perform one of three tasks:

1. Perform the update - This operation performs the update immediately. A dialog box pops up showing the output from `wflash.exe`. See "Steps to perform update (GUI)" on page 72 for details.
2. Extract the Windows update to the hard drive - This extracts all the files necessary to perform the Windows flash to a directory chosen by the user on the hard drive. The extract Windows flash files are useful for inclusion into an automated process. See "Steps to extract the Windows Update to the hard drive (GUI)" on page 72 for details.
3. Extract the DOS update to floppy disk - This extracts a copy of the DOS update disk image to a floppy. this floppy is identical to floppies created with the normal update disk images. See "Steps to extract DOS update files to diskette (GUI)" on page 72 for details.

## Steps to perform update (GUI)

1. Boot the system into the Microsoft Windows operating system.
2. Download the appropriate Windows Update package for the Intel® Server Compute blade SBX82. (Contact your Intel customer representative for more information.)
3. The Windows update package contains the `wflash` utility and the associated BIOS files.
4. Run the Intel® Server Compute Blade SBX82 Windows BIOS update by double-clicking the `wflash.exe`.
5. Choose "Perform Update" and click the "Next" button.
6. If the update is meant for the system on which it is running, the "Next" button will appear. Click the "Next" button to continue.
7. Click the "Exit" button.

## Steps to extract the Windows Update to the hard drive (GUI)

1. Boot the system into the Microsoft Windows operating system.
2. Download the appropriate Windows Update package for the Intel® Server Compute Blade SBX82. (Contact your Intel customer representative for more information.)
3. The Windows update package contains the `wflash` utility and the associated BIOS files.
4. Run the Intel® Server Compute Blade SBX82 Windows BIOS update by double-clicking the `wflash.exe`.
5. Choose "Extract to Hard Drive" and click the "Next" button.
6. Choose a directory into which the Windows update files will be saved in the "Save As" dialog.
7. The files extracted are all files that are necessary to perform a BIOS update under Windows. Run `wflash` from a command line to update BIOS.
8. Click the "Exit" button.

## Steps to extract DOS update files to diskette (GUI)

1. Boot the system into the Microsoft Windows operating system.
2. Download the appropriate Windows Update package for the Intel® Server Compute Blade SBX82. (Contact your Intel customer representative for more information.)
3. The Windows update package contains the `wflash` utility and the associated BIOS files.
4. Run the Intel® Server Compute Blade SBX82 Windows BIOS update by double-clicking the `wflash.exe`.
5. Choose "Extract to Floppy" and click the "Next" button.
6. Place a diskette in the A: drive and press the "OK" button.
7. The diskette created is the DOS BIOS update diskette.
8. Click the "Exit" button.

## Command Line Operation

The `wflash.exe` utility can run from the command line without a GUI. The same three modes of operation available via the GUI mode are available in the command line mode.

The syntax of the update package is:

```
<update>.exe <mode> <target>
```



<mode>	Operation
-s	Perform update (silently).
-x <path>	Extract Microsoft* Windows* update to hard drive directory <path>. If no <path> is specified, defaults to A:
-xd <drive>	Extract DOS update to floppy <drive>. If no <drive> is specified, defaults to A:.

### Steps to perform update in Unattended Mode (Command Line)

1. Boot the system into the Microsoft Windows operating system.
2. Download the appropriate Windows Update package for the Intel® Server Compute Blade SBX82. (Contact your Intel customer representative for more information.)
3. The Windows update package contains the `wflash` utility and the associated BIOS files.
4. Open a command shell and run the "Intel® Server Compute Blade Windows BIOS Update" with the following command line:

```
<update>.exe -s
```

where <update>.exe is the downloaded update.

### Steps to extract the Windows Update to the hard drive in Unattended Mode (Command Line)

1. Boot the system into the Microsoft Windows operating system.
2. Download the appropriate Windows Update package for the Intel® Server Compute Blade SBX82. (Contact your Intel customer representative for more information.)
3. The Windows update package contains the `wflash` utility and the associated BIOS files.
4. Open a command shell and run the "Intel® Server Compute Blade Windows BIOS Update" with the following command line:

```
<update>.exe -x <path>
```

where <update>.exe is the downloaded update and <path> is the path to which the Windows update files will be extracted.

### Steps to extract DOS update files to diskette in Unattended Mode (Command Line)

1. Boot the system into the Microsoft Windows operating system.
2. Download the appropriate Windows Update package for the Intel® Server Compute Blade SBX82. (Contact your Intel customer representative for more information.)
3. The Windows update package contains the `wflash` utility and the associated BIOS files.
4. Open a command shell and run the "Intel® Server Compute Blade Windows BIOS Update" with the following command line:

```
<update>.exe -xd <drive>
```

where <update>.exe is the downloaded update and <drive> is the drive to which the DOS update files will be extracted.

## BIOS Update from Linux Operating System

The Intel® Server Compute Blade SBX82 Linux Update Package includes the `lflash.exe` file, the data files for the firmware being flashed and all files needed to create a DOS flash diskette. The following are supported Linux operating systems for the `lflash` utility:

- Red Hat\* Enterprise Linux 3 Advanced Server (AS) Update 2 or later
- Red Hat\* Enterprise Linux 3 Advanced Server (AS) EM64T
- SUSE\* Linux Enterprise Server 9
- SUSE Linux Enterprise Server 9 EM64T

### GUI operation

The Linux update package does not currently have a GUI mode.

### Command Line Operation

The Linux update package runs from the command line without a GUI. Three modes of operation are available. Use the command shell and run the `lflash` utility from either a Red Hat Enterprise Linux 3 or SUSE Linux Enterprise Server 9 operating system to update the BIOS. See the following table for detailed syntax and step-by-step instructions for each of the three update modes.

The syntax of the update package is:

```
<update>.sh <mode> <target>
```

<mode>	Operation
-s	Perform update (silently).
-x <path>	Extract Microsoft* Windows* update to hard drive directory <path>. If no <path> is specified, defaults to A:
-xd <drive>	Extract DOS update to floppy <drive>. If no <drive> is specified, defaults to A:.

### Steps to perform update in Unattended Mode (Command Line)

1. Boot the system into the Linux operating system.
2. Download the appropriate Linux Update package for the Intel® Server Compute Blade SBX82. (Contact your Intel customer representative for more information.)
3. The Linux update package contains the `lflash` utility and the associated BIOS files.
4. Open a command shell and run the “Intel® Server Compute Blade Linux BIOS Update” with the following command line:

```
<update>.sh -s
```

where `<update>.sh` is the downloaded update.

### Steps to extract the Windows Update to the hard drive in Unattended Mode (Command Line)

1. Boot the system into the Linux operating system.
2. Download the appropriate Linux Update package for the Intel® Server Compute Blade SBX82. (Contact your Intel customer representative for more information.)

3. The Linux update package contains the `lflash` utility and the associated BIOS files.
4. Open a command shell and run the “Intel® Server Compute Blade Windows BIOS Update” with the following command line:  

```
<update>.sh -x <path>
```

where `<update>.sh` is the downloaded update and `<path>` is the path to which the Linux update files will be extracted.

## Steps to extract DOS update files to diskette in Unattended Mode (Command Line)

1. Boot the system into the Linux operating system.
2. Download the appropriate Linux Update package for the Intel® Server Compute Blade SBX82. (Contact your Intel customer representative for more information.)
3. The Linux update package contains the `lflash` utility and the associated BIOS files.
4. Open a command shell and run the “Intel® Server Compute Blade Windows BIOS Update” with the following command line:  

```
<update>.sh -xd <drive>
```

where `<update>.sh` is the downloaded update and `<drive>` is the drive to which the DOS update files will be extracted.

## System Event Log messages

The baseboard management controller (BMC) system event log (SEL) contains up to 512 of the most recent service processor errors in IPMI format. These messages are a combination of plain text and error code numbers. The SEL can be viewed using the SEL Viewer utility, the Diagnostics utility, and the Configuration Setup utility as described below:

- The SEL Viewer utility provides the capability to examine all SEL records in either text or hexadecimal format, to save the SEL to a file, to examine previously stored SEL records from a file, to sort all SEL records by various fields in text format, and to clear all SEL entries.
- The Diagnostics utility provides the capability to view and save all SEL records in text format. To view the SEL from the Diagnostics menu, select **Hardware > BMC Log**.
- The Configuration Setup utility only allows you the ability to view each individual SEL record separately. No additional functions/capabilities are available. To view individual SEL records from the Configuration/Setup Utility menu, select **Advanced>Baseboard Management Controller (BMC) Settings>BMC System Event Log**.

## SEL Viewer utility

The SEL Viewer utility is used to view the SEL records for the Intel® Server Compute Blade SBX82. The utility can be run in an interactive GUI mode through a series of pull-down menus or by using the basic command-line arguments.

This utility provides support for performing the following functions:

### — NOTE

Not all functions are available via the command-line arguments.

- Examine all SEL entries stored in the non-volatile storage area of the blade server in either text or hexadecimal format.
- Examine previously stored SEL entries from a file in either text or hexadecimal format.
- Save the SEL entries to a file.
- Clear the SEL entries from the non-volatile storage area.
- Sort the SEL records by various fields, such as timestamp, sensor type number, event description and generator ID. Sorting functionality is available only in interpreted text format.

## SEL Viewer command-line arguments

The SEL Viewer utility provides (1) the capability to save SEL entries to a file in text or hexadecimal format and (2) the capability to clear the SEL using the basic command-line format and arguments presented in the following table. The basic command-line format is:

```
selview [Options]
```

### ⇒ NOTE

The command-line options listed in the following table are accessed with either the dash "-" or the forward slash "/" character.

*Table 6. SEL Viewer command-line arguments*

Parameter	Description
Selview	The name of the utility.
[File Name]	Output file name (and path) used for saving SEL entries. This option is used in conjunction with <code>/save</code> .
<code>/clear</code>	Clear SEL entries from the non-volatile storage area. This option can not be used with any other option.
<code>/save</code>	Save SEL entries to a file; entries are saved in interpreted text format by default. If the file exists, it is overwritten with the new SEL entries.  This option also requires a file name; that is, the [File Name] option.
<code>/hex</code>	SEL entries are saved to a file in hex format instead of interpreted text format. This option is used in conjunction with <code>/save</code> .
<code>/h</code> or <code>/?</code>	Displays command line help information.

Some examples of the SEL Viewer command-line mode are listed in the following table.

*Table 7. Command-line mode examples*

Action	Command
Save SEL data to a file	Selview selfile.sel /save or Selview selfile.sel -save
Save SEL data to a file in HEX mode	Selview selfile.sel /save /hex or Selview selfile.sel -save -hex
Clear the SEL	Selview /clear or Selview -clear

## Graphical User Interface (GUI)

The SEL Viewer utility can also be run in an interactive mode through a series of pull-down menus. This operating mode is selected when the utility is run with no command-line arguments, as follows:

```
selview
```

### SEL Viewer Main Window

The SEL Viewer Main window is split into 3 sections: the pull-down menus at the top; the display pane, which displays all SEL records; and the SEL Information window at the bottom, which displays detailed information about the currently selected SEL record. To move between each section, press the <Tab> key. From the pull-down menu, use the arrow keys to move around the various menu items and the <Enter> key to select a particular menu item. To move across the display pane, use the arrow keys, <PgDn>, <PgUp>, <Home>, and <End>. The display pane also supports the <F5> key to move forward between columns and <F6> to move backwards.

When the utility is first invoked, the SEL records from non-volatile storage on the server are loaded. A status box, as shown in the following figure, is displayed to indicate that the SEL Viewer is loading SEL records from the server. If there are no SEL entries or the SEL is full, a message is displayed accordingly to indicate these conditions.



*Figure 22 Status Box*

By default, when the SEL Viewer is invoked for the first time, the event log is displayed in an interpreted, easy-to-understand textual form. The interpreted text data is displayed in five columns as follows:

- Number of Event

- Timestamp
- Sensor Type and Number
- Event Description
- Generator ID

The display of data in these columns varies depending on the type of SEL record. For detail information regarding the text displayed, refer to the SEL Data section of this document.

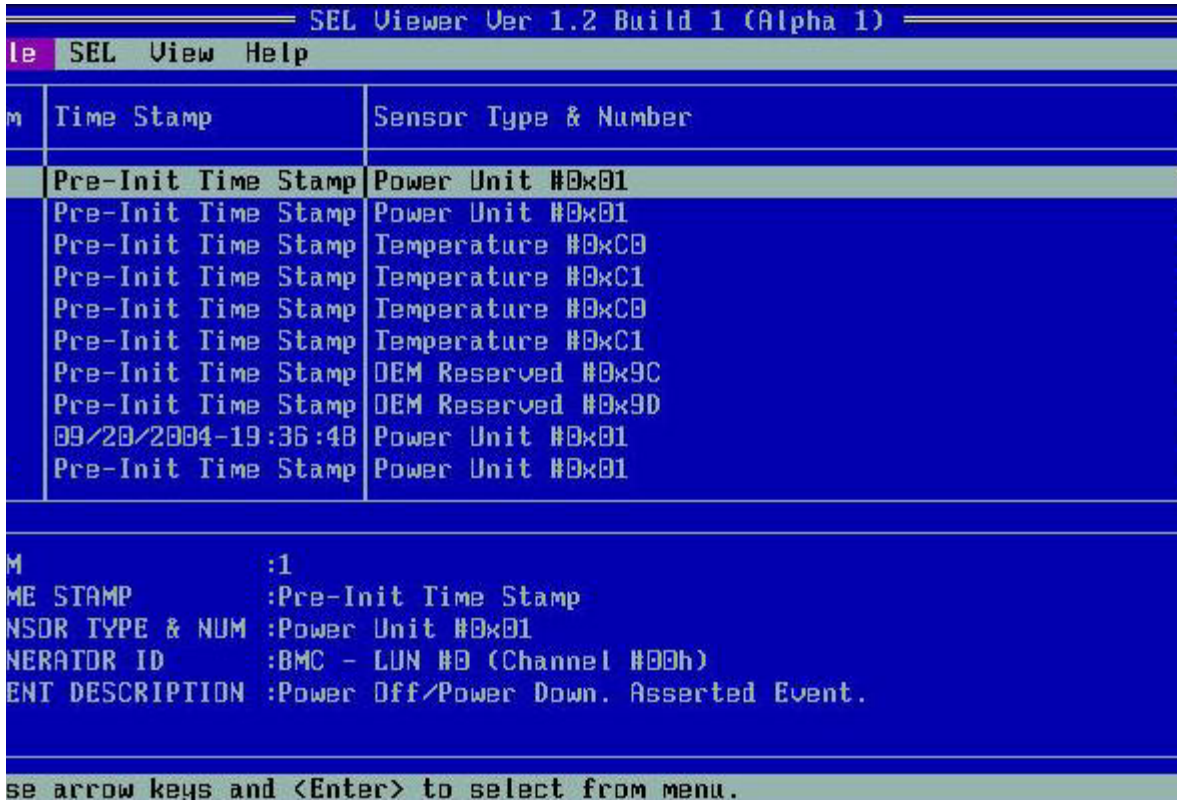


Figure 23 SEL Viewer Utility Main Window

The SEL Viewer can also display event logs in raw hexadecimal format as read from the server (see Figure 24 on page 80). The following table describes the abbreviations used in the hexadecimal mode display.

*Table 8. Abbreviations used in hexadecimal mode display*

Action	Command
RID	Record ID
RT	Record Type
TS	Time Stamp
GID	Generator ID
ER	Event Message Format Revision
ST	Sensor Type
SN	Sensor Number
EDIR	Event Dir and Event Type
ED1	Event Data 1
ED2	Event Data 2
ED3	Event Data 3
MID	Manufacturer ID <sup>1</sup>
OEM	OEM Defined <sup>2</sup>

1. Used when displaying OEM SEL Records Type C0h-DFh
2. Used when displaying OEM SEL records Type C0h-DFh and E0h-EFh

```

===== SEL Viewer Ver 1.2 Build 1 (Alpha 1) =====
File SEL View Help
D:[01][00] RT:[02] TS:[53][00][00][00] GID:[20][00] ER:[04] ST:[09] SN:[00]
D:[02][00] RT:[02] TS:[57][00][00][00] GID:[20][00] ER:[04] ST:[09] SN:[00]
D:[03][00] RT:[02] TS:[58][00][00][00] GID:[20][00] ER:[04] ST:[01] SN:[00]
D:[04][00] RT:[02] TS:[58][00][00][00] GID:[20][00] ER:[04] ST:[01] SN:[00]
D:[05][00] RT:[02] TS:[59][00][00][00] GID:[20][00] ER:[04] ST:[01] SN:[00]
D:[06][00] RT:[02] TS:[59][00][00][00] GID:[20][00] ER:[04] ST:[01] SN:[00]
D:[07][00] RT:[02] TS:[58][00][00][00] GID:[20][00] ER:[04] ST:[C1] SN:[90]
D:[08][00] RT:[02] TS:[58][00][00][00] GID:[20][00] ER:[04] ST:[C1] SN:[90]
D:[09][00] RT:[02] TS:[50][31][4F][41] GID:[20][00] ER:[04] ST:[09] SN:[00]
D:[0A][00] RT:[02] TS:[07][00][00][00] GID:[20][00] ER:[04] ST:[09] SN:[00]
D:[0B][00] RT:[02] TS:[0A][00][00][00] GID:[20][00] ER:[04] ST:[09] SN:[00]
D:[0C][00] RT:[02] TS:[0F][00][00][00] GID:[20][00] ER:[04] ST:[C1] SN:[90]
D:[0D][00] RT:[02] TS:[0F][00][00][00] GID:[20][00] ER:[04] ST:[C1] SN:[90]
D:[0E][00] RT:[02] TS:[09][34][4E][41] GID:[20][00] ER:[04] ST:[02] SN:[C1]
D:[0F][00] RT:[02] TS:[0A][34][4E][41] GID:[20][00] ER:[04] ST:[02] SN:[C1]
D:[10][00] RT:[02] TS:[A3][40][50][41] GID:[20][00] ER:[04] ST:[09] SN:[00]

D:[01][00] RT:[02] TS:[53][00][00][00] GID:[20][00] ER:[04] ST:[09] SN:[00]
DIR:[6F] ED1: [00] ED2: [FF] ED3: [FF]

Use arrow keys and <Enter> to select from menu.

```

Figure 24 SEL records in hexadecimal format

## Pull-Down Menu – File

The **File** pull-down menu includes options for opening and saving system event records to and from data files, respectively. These options are further described in the following sections.

### File Menu Item – Open...

This option allows you to open an existing SEL data file for viewing. This option, by default, prompts the user to specify a file name having the “.sel” file name extension. The SEL file is displayed in the original mode that it was saved in either raw hexadecimal or interpreted text format. When viewing SEL data from a file, all pull-down menus in View menu, except the Resolution mode, are disabled and the SEL information window at the bottom is removed. The disabled pull-down menus in View menu can be enabled by “Reloading” the SEL records from the system.



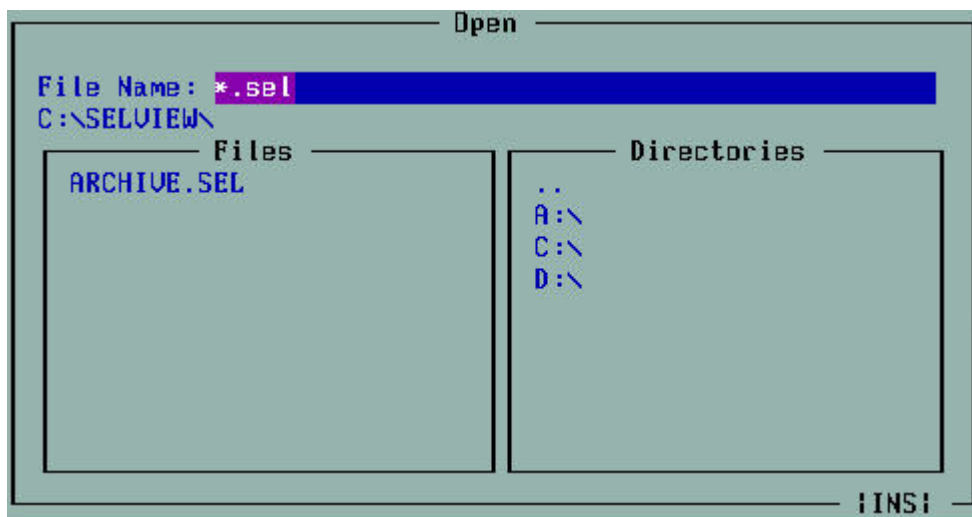


Figure 25 File Open dialog box

The File Open dialog box provides you with the ability to browse drives and directories for existing files. The edit box for entering a file name supports full editing capabilities with the following keys: <Home>, <End>, Left/Right arrows and <Ins>. The <Ins> key toggles between insert and overwrite editing while in the edit box and this is noted with the text “INS” or “OVR”, displayed in the lower-right corner of the dialog box.

If the selected file cannot be opened, an error message will be displayed.

### File Menu Item – Save As...

This option allows you to save the SEL data to a file, with the “.sel” file name extension, either in interpreted text format or raw hexadecimal format, depending on the mode in which records are currently displayed. This option also provides you with the ability to select drives and directories by browsing. If the SEL data cannot be saved or the file cannot be created or overwritten, the program displays error messages accordingly.

### File Menu Item – Exit

This option allows you to exit the utility.

### Pull-Down Menu – SEL

The SEL pull-down menu includes options for reloading SEL entries from the server, clearing the SEL entries, viewing SEL properties, and sorting the entries by different column fields. These options are further described in the following sections.

### SEL Menu Item – Reload

This option allows you to reload the SEL entries from the server. The records are displayed either in the hexadecimal format or the interpreted text format, depending on the display mode set. A status box (shown in Figure 22 on page 77) is displayed to indicate that the SEL Viewer is loading SEL records from the server.

## SEL Menu Item – Properties...

This option allows you the ability to view the SEL properties. The text “Warning: System Event Log is FULL” is displayed if the SEL is full; otherwise, the text is omitted. The “Number of Entries” and “Free Space Remaining” are displayed as numeric values.

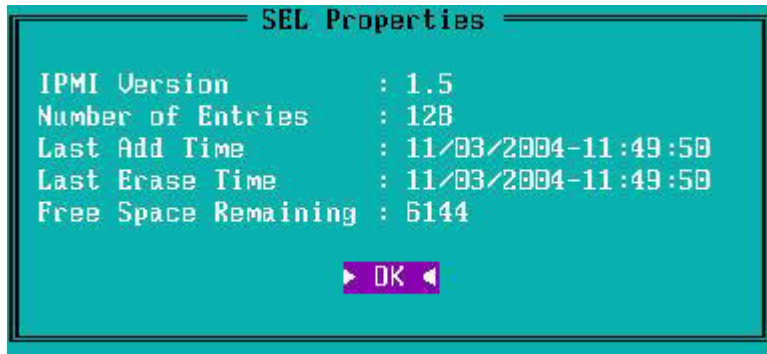


Figure 26 SEL properties

## SEL Menu Item – Clear SEL

This option clears the SEL entries from the non-volatile storage area of the server as well as the entries from the SEL Viewer Main window table. A dialog message prompts you for the confirmation of clearing the SEL.



Figure 27 Confirmation for clearing SEL

## SEL Menu Item – Sort By

This option allows the SEL entries, displayed in the SEL Viewer main window, to be sorted by number, timestamp, sensor type and number, event description or generator ID. Upon choosing the appropriate field, sorting is done by that field. This option is not available if the SEL entries are displayed in hexadecimal mode.

## Pull-Down Menu – View

The View menu enables you to view/hide the SEL Information Window, to change the resolution of the screen and to toggle between text mode and hexadecimal mode.

## **View Menu Item – Hide SEL Info Window/View SEL Info Window**

This option allows you to view/hide the SEL Information Window. By default, the SEL Information window is visible and the sub-menu is shown as “Hide SEL Info Window”. If you select “Hide SEL Info Window”, the SEL Information window is removed from the display area and the sub-menu text changes to “View SEL Info Window”.

## **View Menu Item – Display In Hex/Display In Text**

This option allows you to toggle between the raw hexadecimal mode display and the interpreted text mode display. The menu item name toggles between “Display in hex” and “Display in text” to allow changing from one display mode to the other. When the display mode is changed, the SEL Viewer automatically loads the SEL entries from the server and displays them in the new display mode.

## **View Menu Item – Resolution Mode**

This option allows you to toggle between a high and low resolution mode. This menu provides two sub-menus, “Low” and “High”, to change the resolution. When the resolution mode is changed, the SEL Viewer automatically loads the SEL entries from the server and displays them in the new resolution mode.

## **Pull-Down Menu – Help**

The help menu displays detailed information about program-usage. In addition, it also displays the utility version information and IPMI version number.

## **Help Menu Item – General Help**

This option displays a detailed description on how to use the SEL Viewer utility, as shown in the following figure. The Help window is divided into two panes. The top pane lists all the main topics and the bottom pane displays a description about the topic currently selected in the top pane. Select the different topics by using the arrow keys, <F10> or <Tab> keys to move between windows, and the <Esc> key to dismiss the Help window.

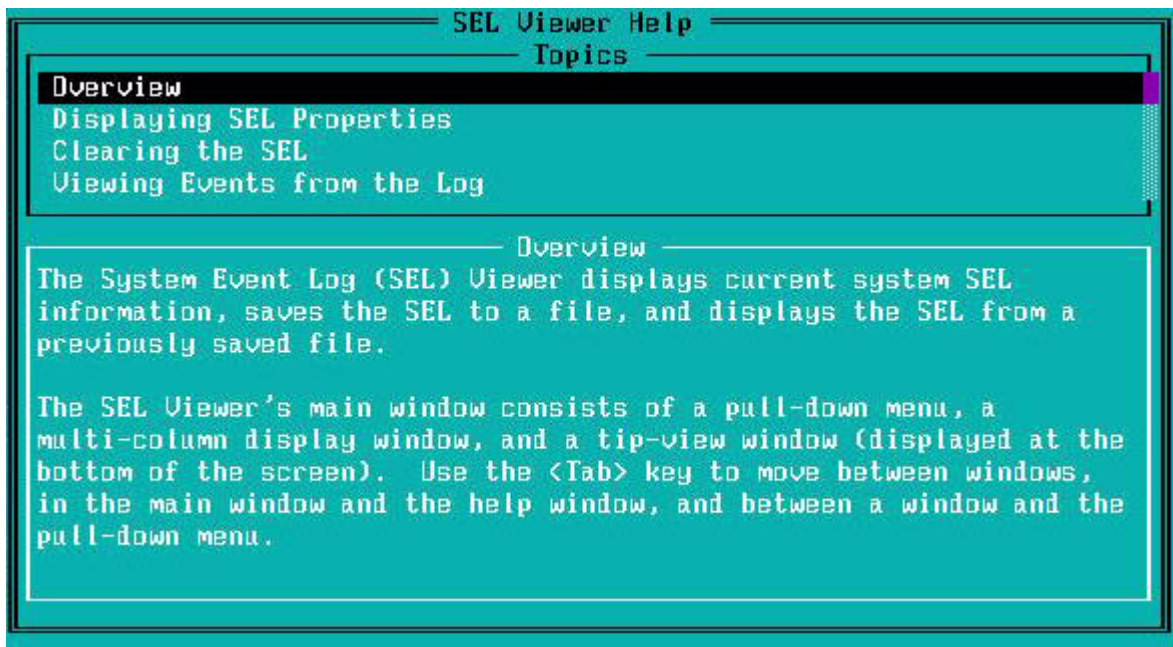


Figure 28 Help window

## Help Menu Item – About

This option displays the SEL Viewer utility version, copyright information and IPMI version information.

## OEM SEL data

In addition to logging a wide variety of sensor types and record IDs for possible system events (as defined by the IPMI Specification), the Intel® Server Compute Blade SBX82 also logs OEM-specific messages in the BMC SEL. The following tables document each OEM record ID and sensor type used by the Server Compute Blade SBX82, along with a text description of the event. Using the information displayed by the SEL Viewer utility in text and hex formats, and the definitions provided in the following tables, you should be able to translate OEM-specific events.

## SEL Viewer display information

For OEM-specific events, the following information is displayed by the SEL Viewer utility in text format.

- OEM sensor type and record IDs with timestamps (C0 – DFh).

### ⇒ NOTE

The following information is only an example.

*Table 9. OEM SEL records with timestamp*

SEL Viewer column	Text displayed
Num	1
Time Stamp	Time Stamp
Sensor Type & Number	OEM data not defined.
Event Description	OEM system event record (Record Type: 0xC0)
Generator ID	OEM data not defined.

- OEM sensor type and record IDs without timestamps (E0 – FFh).

⇒ **NOTE**

The following information is only an example.

*Table 10. OEM SEL records without timestamp*

SEL Viewer column	Text displayed
Num	1
Time Stamp	OEM Data-No Time Stamp Available
Sensor Type & Number	OEM data not defined.
Event Description	OEM system event record (Record Type: 0xE1)
Generator ID	OEM data not defined.

To translate the OEM-specific SEL data displayed in the SEL Viewer utility, use the sensor type record ID provided in the SEL Viewer's event description field and the 16-byte hexadecimal data from the HEX display along with the information presented in the following tables.

## OEM SEL entry definitions

Table 11. POST OEM SEL definitions

Sensor type	Record ID	Byte definitions/description
OEM POST with Time Stamp	0xC0	<p>Byte 11 POST Error / Event Type</p> <p>0x00 POST PCI POST Event/Error</p> <p>0x01 POST PCI Processor Event</p> <p>0x02 POST Memory Error</p> <p>0x03 POST Scalability Event</p> <p>0x04 POST Bus Event</p> <p>0x05 POST Chipset Event</p> <p>Byte 12-15 Defined per Error/Event Type in below tables</p> <p>Byte 16 Revision Number Format</p>
OEM SMI Handler with Time Stamp	0xC1	<p>Byte 11 SMI Error / Event Type</p> <p>0x00 SMI PCI Event / Error</p> <p>0x01 SMI Processor Event / Error</p> <p>0x02 SMI Memory Event / Error</p> <p>0x03 SMI Scalability Event / Error</p> <p>0x04 SMI Bus Event / Error</p> <p>0x05 SMI Chipset Event / Error</p> <p>Byte 12-15 Defined per Error/Event Type in below tables</p> <p>Byte 16 Revision Number Format</p>
OEM POST No Time Stamp	0xE0	<p>Byte 4 POST Error / Event Type</p> <p>0x00 POST PCI POST Event/Error</p> <p>0x01 POST PCI Processor Event</p> <p>0x02 POST Memory Error</p> <p>0x03 POST Scalability Event</p> <p>0x04 POST Bus Event</p> <p>0x05 POST Chipset Event</p> <p>Byte 5-15 Defined per Error/Event Type in below tables</p> <p>Byte 16 Revision Number Format</p>
OEM SMI Handler No Time Stamp	0xE1	<p>Byte 4 SMI Error / Event Type</p> <p>0x00 SMI PCI Event / Error</p> <p>0x01 SMI Processor Event / Error</p> <p>0x02 SMI Memory Event / Error</p> <p>0x03 SMI Scalability Event / Error</p> <p>0x04 SMI Bus Event / Error</p> <p>0x05 SMI Chipset Event / Error</p> <p>Byte 5-15 Defined per Error/Event Type in below tables</p> <p>Byte 16 Revision Number Format</p>

## POST OEM SEL formats with timestamp

Table 12. POST PCI event/error SEL format

Byte	Description
11	0x00 POST PCI Event/Error
12	Error Type 0x00 PCI Event/Error occurred. Next non-time stamped OEM SEL entry will contain details of the specific PCI event/error
13:15	Reserved
16	Revision Number = 0x00

## SMI OEM SEL formats with timestamp

No OEM messages are defined at this time.

## POST OEM SEL formats without timestamp

Table 13. POST PCI event/error SEL format

Byte	Description
4	0x00 POST PCI Event/Error
5	Error Type 0x00 Device OK 0x01 Required ROM space not available 0x02 Required IO space not available 0x03 Required memory not available 0x04 Required memory below 1MB not available 0x05 ROM checksum failed 0x06 BIST failed 0x07 Planar device missing or disabled by user 0x08 PCI device has an invalid PCI configuration space header 0x09 Specific PCI Device added (details to follow) 0x0A Specific PCI Device removed (details to follow) 0x0B Device title for removed devices 0x0C Device title for added devices 0x0D Requested resources not available 0x0E Title for added devices 0x0F Vendor ID sub-message 0x10 Device ID sub-message 0x11 Previous slot sub-message 0x12 Slot sub-message 0x13 Planar video disabled due to add in video card 0x14 Partial disable value 0x15 Title for partial disable 0x16 33Mhz dev on 66Mhz bus 0x17 Details for 33mhz card on 66mhz bus 0x18 Merge cable missing 0x19 Node1 to Node2 cable missing 0x1A Node1 to Node3 cable missing 0x1B Node2 to Node3 cable missing 0x1C Nodes could not merge 0x1D no 8 way SMP cable
6	Chassis Number (0xFF if not applicable)
7	Slot Number (0xFF if not applicable)
8	Bus Number (0xFF if not applicable)
9	Device ID (MSB) (0xFF if not applicable)
10	Device ID (LSB) (0xFF if not applicable)
11	Vendor ID (MSB) (0xFF if not applicable)
12	Vendor ID (LSB) (0xFF if not applicable)
13	Reserved
14	Reserved



Table 13. POST PCI event/error SEL format

Byte	Description
15	Reserved
16	Revision Number = 0x00

## POST processor event/error SEL format

Table 14. POST processor event/error SEL format

Byte	Description
4	0x01 POST Processor Event / Error
5	Error Type 0x00 Processor Failed BIST 0x01 Unable to Apply Microcode (Patch) Update 0x02 POST Does Not Support Current Stepping of Processor
6	Chassis Number (0x00 if not applicable)
7	Processor Number
8	Reserved
9	Reserved
10	Reserved
11	Reserved
12	Reserved
13	Reserved
14	Reserved
15	Reserved
16	Revision Number = 0x00

## SMI OEM SEL formats without timestamp

Table 15. SMI PCI event/error SEL format

Byte	Description
4	0x00 SMI PCI Event / Error
5	Error Type 0x00 Unknown SERR/PERR Detected on PCI Bus 0x01 SERR: Address or Special Cycle DPE 0x02 PERR: Master Read Parity Error 0x03 SERR: Received Target Abort 0x04 PERR: Master Write Parity Error 0x05 SERR: Device Signaled SERR 0x06 PERR: Slave Signaled Parity Error 0x07 SERR: Signaled Target Abort 0x08 -0xFF Reserved
6	Chassis Number (0x00 if not applicable)
7	Slot Number
8	Bus Number
9	Device ID (LSB)
10	Device ID (MSB)
11	Vendor ID (LSB)
12	Vendor ID (MSB)
13	Status Register (LSB)
14	Status Register (MSB)
15	Reserved
16	Revision Number = 0x00

## SMI processor event/error SEL format

Table 16. SMI MCA Data A SEL format

Byte	Description
4	0x01 SMI Processor Event / Error
5	0x00 Data A
6	Reserved
7	Reserved
8 – 9	Bank
10 – 11	APIC ID
12 – 15	CK4
16	Revision Number = 0x00

Table 17. SMI MCA Data B1 SEL format

Byte	Description
4	0x01 SMI Processor Event / Error
5	0x01 Data B1
6	Reserved
7	Reserved
8 – 11	Address high
12 – 15	Address low
16	Revision Number = 0x00

Table 18. SMI MCA Data B2 SEL format

Byte	Description
4	0x01 SMI Processor Event / Error
5	0x02 Data B2
6	Reserved
7	Reserved
8 – 11	Timestamp high
12 – 15	Timestamp low
16	Revision Number = 0x00

*Table 19. SMI MCA Data C SEL format*

Byte	Description
4	0x01 SMI Processor Event / Error
5	0x03 Detail C
6	Reserved
7	Reserved
8 – 11	MCA Status Register high
12 – 15	MCA Status Register low
16	Revision Number = 0x00

*Table 20. SMI MCA Data D SEL format*

Byte	Description
4	0x01 SMI Processor Event / Error
5	0x04 Detail D
6	Chassis Number (00 if not applicable)
7	Error type 0x00 Recoverable 0x01 Unrecoverable
8	Processor ID
9 – 15	Reserved
16	Revision Number = 0x00

## SMI memory event/error SEL format

Table 21. SMI Sparing 1 SEL format

Byte	Description
4	0x02 SMI Memory Event / Error
5	0x00 Sparing Event
6	0x00 Sparing Start 1 0x02 Sparing Done 1
7	Failed Row
8	Spare Row
9 – 15	Reserved
16	Revision Number = 0x00

Table 22. SMI Sparing 2 SEL format

Byte	Description
4	0x02 SMI Memory Event / Error
5	0x00 Sparing Event
6	0x01 Sparing Start 2 0x03 Sparing Done 2
7	Failed Row 1
8	Failed Row 2
9	Spare Row 1
10	Spare Row 2

Table 23. SMI Mirroring SEL format

Byte	Description
4	0x02 SMI Memory Event / Error
5	0x01 Memory Mirroring Failover Occurred (Running from mirrored memory image)
6 - 15	Reserved
16	Revision Number = 0x00

## SMI bus event/error SEL format

Table 24. SMI Front Side Bus Event SEL format

Byte	Description
4	0x04 SMI Bus Event / Error
5	Bus Type 0x00 FSB
6	0x00 FSB Fatal 0x01 FSBNonFatal
7 – 8	FSB FERR or NERR
9 – 15	Reserved
16	Revision Number = 0x00

## SMI chipset event/error SEL format

Table 25. SMI hub interface error SEL format

Byte	Description
4	0x05 = SMI Chipset Event / Error
5	Chipset Type 00h = Intel® E7520 Chipset Event
6	0x02 HiFatal 0x03 HiNonFatal
7	Hi FERR or NERR
8-15	Reserved
16	Revision Number = 0x00

## 8 Symptom-to-FRU index

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This index supports the Intel® Server Compute Blade SBX82.

### Notes:

1. Check the configuration before you replace a FRU. Configuration problems can cause false errors and symptoms.
2. For devices not supported by this index, refer to the manual for that device.

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 column of the tables in this index lists error codes or messages, and the right 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	<ul style="list-style-type: none"><li>• One beep</li><li>• A pause (or break)</li><li>• Two beeps</li><li>• A pause (or break)</li><li>• Three beeps</li></ul>
4	Four continuous beeps

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

— **NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

Beep/symptom	FRU/action
<b>1-1-2</b> (Microprocessor register test failed)	<ol style="list-style-type: none"> <li>Optional microprocessor (if installed)</li> <li>Microprocessor</li> <li>System board assembly</li> </ol>
<b>1-1-3</b> (CMOS write/read test failed)	<ol style="list-style-type: none"> <li>Battery</li> <li>System board assembly</li> </ol>
<b>1-1-4</b> (BIOS ROM checksum failed)	<ol style="list-style-type: none"> <li>Flash BIOS.</li> <li>DIMM.</li> <li>System board assembly.</li> </ol>
<b>1-2-1</b> (Programmable Interval Timer failed)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>1-2-2</b> (DMA initialization failed)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>1-2-3</b> (DMA page register write/read failed)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>1-2-4</b> (RAM refresh verification failed)	<ol style="list-style-type: none"> <li>DIMM</li> <li>System board assembly</li> </ol>
<b>1-3-1</b> (first 64K RAM test failed)	<ol style="list-style-type: none"> <li>DIMM</li> <li>System board assembly</li> </ol>
<b>1-3-2</b> (first 64K RAM parity test failed)	<ol style="list-style-type: none"> <li>DIMM</li> <li>System board assembly</li> </ol>
<b>2-1-1</b> (Secondary DMA register failed)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>2-1-2</b> (Primary DMA register failed)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>2-1-3</b> (Primary interrupt mask register failed)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>2-1-4</b> (Secondary interrupt mask register failed)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>2-2-1</b> (Interrupt vector loading failed)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>2-2-2</b> (Keyboard controller failed)	<ol style="list-style-type: none"> <li>Keyboard</li> <li>System board assembly</li> <li>Management module</li> </ol>



— **NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

Beep/symptom	FRU/action
<b>2-2-3</b> (CMOS power failure and checksum checks failed)	<ol style="list-style-type: none"> <li>1. Battery</li> <li>2. System board assembly</li> </ol>
<b>2-2-4</b> (CMOS configuration information validation failed)	<ol style="list-style-type: none"> <li>1. Battery</li> <li>2. System board assembly</li> </ol>
<b>2-3-1</b> (Screen initialization failed)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>2-3-2</b> (Screen memory failed)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>2-3-3</b> (Screen retrace failed)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>2-3-4</b> (Search for video ROM failed)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>2-4-1</b> (Video failed; screen believed operable)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>2-4-4</b> (Unsupported memory configuration)	<ol style="list-style-type: none"> <li>1. Correct based on 289 POST Error Code if displayed.</li> <li>2. Check DIMM error LEDs.</li> <li>3. Check Management Module for DIMM errors.</li> </ol>
<b>3-1-1</b> (Timer tick interrupt failed)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>3-1-2</b> (Interval timer channel 2 failed)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>3-1-3</b> (RAM test failed above address OFFFFH)	<ol style="list-style-type: none"> <li>1. DIMM</li> <li>2. System board assembly</li> </ol>
<b>3-1-4</b> (Time-Of-Day clock failed)	<ol style="list-style-type: none"> <li>1. Battery</li> <li>2. System board assembly</li> </ol>
<b>3-2-1</b> (Serial port failed)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>3-2-2</b> (Parallel port failed)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>3-2-3</b> (Math coprocessor test failed)	<ol style="list-style-type: none"> <li>1. Microprocessor</li> <li>2. System board assembly</li> </ol>
<b>3-2-4</b> (Failure comparing CMOS memory size against actual)	<ol style="list-style-type: none"> <li>1. DIMM</li> <li>2. System board assembly</li> <li>3. Battery</li> </ol>

<p>— <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
Beep/symptom	FRU/action
<p><b>3-3-1</b> (Memory size mismatch occurred.)</p>	<ol style="list-style-type: none"> <li>1. Verify that both DIMMs in bank are of the same size, speed, type and technology.</li> <li>2. DIMM</li> <li>3. System board assembly</li> <li>4. Battery</li> </ol>
<p><b>3-3-2</b> (Critical SMBUS error occurred)</p>	<ol style="list-style-type: none"> <li>1. Power down blade server and reseal it in chassis.</li> <li>2. DIMMs.</li> <li>3. System board assembly.</li> </ol>
<p><b>3-3-3</b> (No operational memory in system)</p> <p>— <b>NOTE</b> 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 <b>Boot Fail Count</b> feature in the <b>Start Options</b> of the Configuration/Setup Utility is set to <b>Enabled</b> (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 <b>Disabled</b> to <b>Enabled</b>.</p>	<ol style="list-style-type: none"> <li>1. Install or reseal the memory modules, and then do a 3 boot reset.</li> <li>2. DIMMs.</li> <li>3. System board assembly.</li> </ol>
<p><b>Two short beeps</b> (Information only, the configuration has changed)</p>	<ol style="list-style-type: none"> <li>1. Run Diagnostics.</li> <li>2. Run the Configuration/Setup Utility program.</li> </ol>
<p><b>Three short beeps</b></p>	<ol style="list-style-type: none"> <li>1. DIMM</li> <li>2. System board assembly</li> </ol>
<p><b>One continuous beep</b></p>	<ol style="list-style-type: none"> <li>1. Microprocessor</li> <li>2. Optional microprocessor (if installed)</li> <li>3. System board assembly</li> </ol>
<p><b>Repeating short beeps</b></p>	<ol style="list-style-type: none"> <li>1. Keyboard</li> <li>2. System board assembly</li> </ol>

## No-beep symptoms

<b>= NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.	
No-beep symptom	FRU/action
<b>No beep and the system operates correctly.</b>	<ul style="list-style-type: none"><li>• <b>System board assembly</b></li></ul>
<b>No beep and no video</b> (System error LED is OFF)	<ul style="list-style-type: none"><li>• See “<b>Undetermined problems</b>” on page 126.</li></ul>
<b>No beep and no video</b> (System Attention LED is ON)	<ul style="list-style-type: none"><li>• See “<b>Light Path Diagnostics</b>” on page 70.</li></ul>

## 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.

<b>NOTE</b> See "System" on page 130 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/action
<b>001-250-000</b> (Failed processor board ECC)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>001-292-000</b> (Core system: failed/CMOS checksum failed)	<ul style="list-style-type: none"> <li><b>Load BIOS defaults and rerun test.</b></li> </ul>
<b>001-XXX-000</b> (Failed core tests)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>001-XXX-001</b> (Failed core tests)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>005-XXX-000</b> (Failed video test)	<ul style="list-style-type: none"> <li><b>System board assembly</b></li> </ul>
<b>030-XXX-000</b> (Failed internal SCSI interface test)	<ol style="list-style-type: none"> <li>SCSI storage expansion unit</li> <li>System board assembly</li> </ol>
<b>035-XXX-099</b>	<ol style="list-style-type: none"> <li>No adapters were found.</li> <li>If adapter is installed re-check connection.</li> </ol>
<b>075-XXX-000</b> (Failed power supply test)	<ul style="list-style-type: none"> <li><b>Power supply</b></li> </ul>
<b>089-XXX-001</b> (Failed microprocessor test)	<ol style="list-style-type: none"> <li>Microprocessor 1</li> <li>System board assembly</li> </ol>
<b>089-XXX-002</b> (Failed optional microprocessor test)	<ol style="list-style-type: none"> <li>Optional microprocessor 2</li> <li>System board assembly</li> </ol>
<b>165-060-000</b> (Service Processor: ASM may be busy)	<ol style="list-style-type: none"> <li>Rerun the diagnostic test.</li> <li>Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel.</li> <li>Power down blade server and reseal it in chassis.</li> <li>System board assembly.</li> </ol>
<b>165-198-000</b> (Service Processor: Aborted)	<ol style="list-style-type: none"> <li>Rerun the diagnostic test</li> <li>Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel.</li> <li>Power down blade server and reseal it in chassis.</li> <li>System board assembly.</li> </ol>
<b>165-201-000</b> (Service Processor: Failed)	<ol style="list-style-type: none"> <li>Power down blade server and reseal it in chassis.</li> <li>System board assembly.</li> </ol>
<b>165-330-000</b> (Service Processor: Failed)	<ul style="list-style-type: none"> <li><b>Update to the latest ROM diagnostic level and retry.</b></li> </ul>
<b>165-342-000</b> (Service Processor: Failed)	<ol style="list-style-type: none"> <li>Ensure latest firmware levels for ASM and BIOS are installed.</li> <li>Power down blade server and reseal it in chassis.</li> <li>System board assembly.</li> </ol>

<p> <b>NOTE</b>            See “System” on page 130 to determine which components should be replaced by a field service technician.         </p>	
Error code/symptom	FRU/action
<b>166-406-001 System Management: Failed</b> (BMC indicates failure in I2C bus test.)	<ol style="list-style-type: none"> <li>1. Remove blade server, wait 30 seconds, reinsert the blade server, and retry.</li> <li>2. Reflash or update firmware for BMC.</li> <li>3. SCSI storage expansion unit.</li> <li>4. System board assembly.</li> </ol>
<b>166-407-001 System Management: Failed</b> (BMC indicates failure in I2C bus test.)	<ol style="list-style-type: none"> <li>1. Remove blade server, wait 30 seconds, reinsert the blade server, and retry.</li> <li>2. Reflash or update firmware for BMC.</li> <li>3. Operator information panel cable.</li> <li>4. Operator information panel.</li> <li>5. System board assembly.</li> </ol>
<b>166-NNN-001 System Management: Failed</b> (BMC indicates failure in self test, where NNN=300 to 320.)	<ol style="list-style-type: none"> <li>1. Remove blade server, wait 30 seconds, reinsert the blade server, and retry.</li> <li>2. Reflash or update firmware for BMC.</li> <li>3. System board assembly.</li> </ol>
<b>166-NNN-001 System Management: Failed</b> (BMC indicates failure in I2C bus test, where NNN=400 to 420 (excluding 406 and 407).)	<ol style="list-style-type: none"> <li>1. Remove blade server, wait 30 seconds, reinsert the blade server, and retry.</li> <li>2. Reflash or update firmware for BMC.</li> <li>3. System board assembly.</li> </ol>
<b>180-XXX-000</b> (Diagnostics LED failure)	<ul style="list-style-type: none"> <li>• <b>Run diagnostics panel LED test for the failing LED.</b></li> </ul>
<b>180-XXX-001</b> (Failed front LED panel test)	<ol style="list-style-type: none"> <li>1. Front bezel with customer interface card</li> <li>2. System board assembly</li> </ol>
<b>180-XXX-002</b> (Failed diagnostics LED panel test)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>180-XXX-003</b> (Failed system board LED test)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>180-XXX-005</b> (Failed SCSI backplane LED test)	<ol style="list-style-type: none"> <li>1. SCSI storage expansion unit</li> <li>2. System board assembly</li> </ol>
<b>201-XXX-0nn</b> (Failed memory test.)	<ol style="list-style-type: none"> <li>1. <b>DIMM Location slots 1-4 where <i>nn</i> = DIMM location.</b>  <p> <b>NOTE</b>  <i>nn</i> 1=DIMM 1; 2=DIMM 2; 3=DIMM 3; 4=DIMM 4.           </p> </li> <li>2. System board assembly.</li> </ol>
<b>201-XXX-n99</b> (Multiple DIMM failure, see error text)	<ol style="list-style-type: none"> <li>1. See error text for failing DIMMs.</li> <li>2. System board assembly.</li> </ol>
<p> <b>NOTE</b>            n = number of failing pair.         </p>	

<p>— <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
Error code/symptom	FRU/action
<p><b>202-XXX-001</b> (Failed system cache test)</p>	<ol style="list-style-type: none"> <li>1. Microprocessor 1</li> <li>2. System board assembly</li> </ol>
<p><b>202-XXX-002</b> (Failed system cache test)</p>	<ol style="list-style-type: none"> <li>1. Microprocessor 2</li> <li>2. System board assembly</li> </ol>
<p><b>217-198-XXX</b> (Could not establish drive parameters)</p>	<ul style="list-style-type: none"> <li>• <b>SCSI storage expansion unit</b></li> </ul>
<p><b>217-XXX-000</b> (Failed hard disk drive test)</p> <p>— <b>NOTE</b> If RAID is configured, the hard disk drive number refers to the RAID logical array.</p>	<ul style="list-style-type: none"> <li>• <b>Hard disk drive 1</b></li> </ul>
<p><b>217-XXX-001</b> (Failed hard disk test)</p> <p>— <b>NOTE</b> If RAID is configured, the hard disk number refers to the RAID logical array.</p>	<ul style="list-style-type: none"> <li>• <b>Hard disk drive 2</b></li> </ul>
<p><b>405-XXX-000</b> (Failed Ethernet test on controller on the system board)</p>	<ol style="list-style-type: none"> <li>1. Verify that Ethernet is not disabled in BIOS.</li> <li>2. System board assembly.</li> </ol>

## POST error codes

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

<p> <b>NOTE</b>            See “System” on page 130 to determine which components should be replaced by a field service technician.         </p>	
Error code/symptom	FRU/action
<b>062</b> (Three consecutive startup failures using the default configuration.)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Battery.</li> <li>3. System board assembly.</li> <li>4. Microprocessor.</li> </ol>
<b>101, 102</b> (System and processor error)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>106</b> (System and processor error)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>111</b> (Channel check error)	<ol style="list-style-type: none"> <li>1. Failing adapter</li> <li>2. DIMM</li> <li>3. System board assembly</li> </ol>
<b>114</b> (Adapter read-only memory error)	<ul style="list-style-type: none"> <li>• <b>Failing adapter.</b></li> </ul>
<b>151</b> (Real time clock error)	<ol style="list-style-type: none"> <li>1. Battery.</li> <li>2. System board assembly.</li> </ol>
<b>161</b> (Real time clock battery error)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Battery.</li> <li>3. System board assembly.</li> </ol>
<b>162</b> (Device configuration error)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> </ol> If unable to enter Configuration/Setup Utility program, view system event log in SBCE management module.
<p> <b>NOTE</b>            Be sure to load the default settings and any additional desired settings; then, <i>save the configuration.</i> </p>	<ol style="list-style-type: none"> <li>2. Battery.</li> <li>3. Failing device.</li> <li>4. System board assembly.</li> </ol>
<b>163</b> (Real-time clock error)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Battery.</li> <li>3. System board assembly.</li> </ol>
<b>164</b> (Memory configuration changed.)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. DIMM.</li> <li>3. System board assembly.</li> </ol>
<b>165</b> (Service Processor failure)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>184</b> (Power-on password damaged)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. System board assembly.</li> </ol>
<b>185</b> (Drive startup sequence information corrupted)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. System board assembly.</li> </ol>

= <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/action
<b>189</b> (An attempt was made to access the server with invalid passwords)	<ul style="list-style-type: none"> <li>• <b>Run the Configuration/Setup Utility program, and enter the administrator password.</b></li> </ul>
<b>196</b> (Microprocessor cache mismatch)	<ol style="list-style-type: none"> <li>1. Ensure all microprocessors have the same cache size.</li> <li>2. Microprocessor with incorrect cache size.</li> </ol>
<b>198</b> (Microprocessor speed mismatch)	<ol style="list-style-type: none"> <li>1. Ensure all microprocessors are the same speed.</li> <li>2. Microprocessor with incorrect speed.</li> </ol>
<b>199</b> (Microprocessor technology mismatch)	<ol style="list-style-type: none"> <li>1. Ensure all microprocessors belong to the same CPU family.</li> <li>2. Microprocessor with incorrect technology.</li> </ol>
<b>201</b> (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.	<ol style="list-style-type: none"> <li>1. DIMM</li> <li>2. System board assembly</li> </ol>
<b>229</b> (Cache error)	<ol style="list-style-type: none"> <li>1. Microprocessor</li> <li>2. Optional microprocessor (if installed)</li> </ol>
<b>262</b> (DRAM parity configuration error)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Battery.</li> <li>3. System board assembly.</li> </ol>
<b>289</b> (DIMM disabled by POST or SMI)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Disabled DIMM.</li> <li>3. System board assembly</li> </ol>
<b>289</b> (Unsupported memory configuration. Booting min. valid config, Install in pairs starting at DIMM 1. System Halted)	<ul style="list-style-type: none"> <li>• <b>Verify that DIMMs are installed in pairs, starting with DIMM 1 and 2 (DIMM slots 1 and 2 must have DIMMs installed before slots 3 and 4).</b></li> </ul> <p>= <b>NOTE</b> For proper termination, both slots of a DIMM pair must have DIMMs installed.</p>
<b>289</b> (Unsupported memory configuration. Install dual ranked DIMM pairs before single ranked DIMM pairs. System Halted)	<ul style="list-style-type: none"> <li>• <b>Exchange the DIMMs in slots 3 and 4 with the DIMMs in slots 1 and 2.</b></li> </ul> <p>= <b>NOTE</b> Dual-ranked DIMMs must be in slots 1 and 2.</p>
<b>289</b> (Unsupported memory configuration. No Valid Dual Channel Config. Booting Low Performance Single Channel Mode)	<ol style="list-style-type: none"> <li>1. Verify that: <ul style="list-style-type: none"> <li>• DIMM slots 1 and 2 both have DIMMs installed.</li> <li>• No memory errors are indicated by the DIMM error LEDs. or in the SBCE management module.</li> </ul> </li> <li>2. DIMM indicated by the DIMM error LEDs or in the SBCE management module.</li> </ol>



— **NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>301</b> (Keyboard or keyboard controller error)	<ol style="list-style-type: none"> <li>1. Keyboard</li> <li>2. System board assembly</li> </ol>
<b>303</b> (Keyboard controller error)	<ul style="list-style-type: none"> <li>• <b>System board assembly</b></li> </ul>
<b>602</b> (Invalid diskette boot record)	<ol style="list-style-type: none"> <li>1. Diskette</li> <li>2. Diskette drive</li> <li>3. Cable</li> <li>4. System board assembly</li> </ol>
<b>604</b> (Diskette drive error)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Diskette drive.</li> <li>3. Drive cable.</li> <li>4. System board assembly.</li> </ol>
<b>605</b> (Unlock failure)	<ol style="list-style-type: none"> <li>1. Diskette drive</li> <li>2. Drive cable</li> <li>3. System board assembly</li> </ol>
<b>662</b> (Diskette drive configuration error)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Diskette drive.</li> <li>3. Drive cable.</li> <li>4. System board assembly.</li> </ol>
<b>762</b> (Coprocessor configuration error)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Battery.</li> <li>3. Microprocessor.</li> </ol>
<b>962</b> (Parallel port configuration error)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program and verify that the parallel-port setting is correct.</li> <li>2. System board assembly.</li> </ol>
<b>11XX</b> (System board serial port 1 or 2 error)	<ol style="list-style-type: none"> <li>1. Disconnect the external cable on the serial port.</li> <li>2. Run the Configuration/Setup Utility program.</li> <li>3. System board assembly.</li> </ol>
<b>1162</b> (Serial port configuration conflicts)	<ol style="list-style-type: none"> <li>1. <b>Run the Configuration/Setup Utility program</b> and ensure that the IRQ and I/O port assignments needed by the serial port are available.</li> <li>2. If all interrupts are being used by adapters, remove an adapter or force other adapters to share an interrupt.</li> </ol>
<b>1301</b> (I2C cable to operator information panel not found)	<ol style="list-style-type: none"> <li>1. Cable</li> <li>2. Operator information card</li> <li>3. Power switch assembly</li> <li>4. System board assembly</li> </ol>

— **NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>1302</b> (I2C cable from system board to power-on and reset switches not found)	<ol style="list-style-type: none"> <li>1. Cable</li> <li>2. Power switch assembly</li> <li>3. System board assembly</li> </ol>
<b>1303</b> (I2C cable from system board to power backplane not found)	<ol style="list-style-type: none"> <li>1. Cable</li> <li>2. Power supply</li> <li>3. System board assembly</li> </ol>
<b>1304</b> (I2C cable to diagnostic LED board not found)	<ol style="list-style-type: none"> <li>1. Power switch assembly</li> <li>2. System board assembly</li> </ol>
<b>1762</b> (Hard disk configuration error)	<ol style="list-style-type: none"> <li>1. Hard disk drive.</li> <li>2. Hard disk drive cables.</li> <li>3. Run the Configuration/Setup Utility program.</li> <li>4. SCSI storage expansion unit.</li> <li>5. System board assembly.</li> </ol>
<b>178X</b> (Fixed disk error)	<ol style="list-style-type: none"> <li>1. Hard disk drive cables.</li> <li>2. Run diagnostics.</li> <li>3. Hard disk drive.</li> <li>4. System board assembly.</li> </ol>
<b>1800</b> (No more hardware interrupt available for PCI adapter)	<ol style="list-style-type: none"> <li>1. Run Configuration/Setup to verify that the interrupt resource settings are correct.</li> <li>2. Failing adapter (if installed).</li> <li>3. System board assembly.</li> </ol>
<b>1962</b> (Drive does not contain a valid boot sector)	<ol style="list-style-type: none"> <li>1. Verify that a startable operating system is installed.</li> <li>2. Run diagnostics.</li> <li>3. Hard disk drive.</li> <li>4. SCSI storage expansion unit.</li> <li>5. System board assembly.</li> </ol>
<b>2400</b> (Video controller test failure)	<ol style="list-style-type: none"> <li>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 monitor.</li> <li>2. Verify that the monitor is connected correctly to the SBCE unit.</li> <li>3. Video adapter (if installed).</li> <li>4. System board assembly.</li> </ol>

**— NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>2462</b> (Video memory configuration error)	<ol style="list-style-type: none"> <li>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 monitor.</li> <li>2. Verify that the monitor is connected correctly to the SBCE unit.</li> <li>3. Video adapter (if installed).</li> <li>4. System board assembly.</li> </ol>
<b>5962</b> (IDE CD-ROM drive configuration error)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. CD-ROM drive.</li> <li>3. CD-ROM power cable.</li> <li>4. IDE cable.</li> <li>5. System board assembly.</li> <li>6. Battery.</li> </ol>
<b>8603</b> (Pointing-device error)	<ol style="list-style-type: none"> <li>1. Pointing device</li> <li>2. System board assembly</li> </ol>
<b>0001200</b> (Machine check architecture error)	<ol style="list-style-type: none"> <li>1. Microprocessor 1</li> <li>2. Optional microprocessor 2</li> <li>3. System board assembly</li> </ol>
<b>00012000</b> (Microprocessor machine check)	<ol style="list-style-type: none"> <li>1. Microprocessor</li> <li>2. System board assembly</li> </ol>
<b>00019501</b> (Microprocessor 1 is not functioning - check VRM and microprocessor LEDs)	<ol style="list-style-type: none"> <li>1. Microprocessor 1</li> <li>2. System board assembly</li> </ol>
<b>00019502</b> (Microprocessor 2 is not functioning – check VRM and microprocessor LEDs)	<ol style="list-style-type: none"> <li>1. Microprocessor 2</li> <li>2. System board assembly</li> </ol>
<b>00019701</b> (Microprocessor 1 failed)	<ol style="list-style-type: none"> <li>1. Microprocessor 1</li> <li>2. System board assembly</li> </ol>
<b>00019702</b> (Microprocessor 2 failed)	<ol style="list-style-type: none"> <li>1. Microprocessor 2</li> <li>2. System board assembly</li> </ol>
<b>00151200</b> (microprocessor machine check)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Microprocessor (check error LED for failing microprocessor).</li> <li>3. System board assembly.</li> </ol>
<b>00180200</b> (No more I/O space available for adapter)	<ol style="list-style-type: none"> <li>1. Run the Configuration/Setup Utility program.</li> <li>2. Failing adapter.</li> <li>3. System board assembly.</li> </ol>
<b>01295085</b> (ECC checking hardware test error)	<ol style="list-style-type: none"> <li>1. System board assembly</li> <li>2. Microprocessor</li> </ol>

**NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

Error code/symptom	FRU/action
<b>01298101</b> (System BIOS installed on this server does not support level of processor)	<ol style="list-style-type: none"> <li>1. Ensure that microprocessor 1 is supported.</li> <li>2. Microprocessor 1.</li> </ol>
<b>01298102</b> (System BIOS installed on this server does not support level of processor)	<ol style="list-style-type: none"> <li>1. Ensure that microprocessor 2 is supported.</li> <li>2. Microprocessor 2.</li> </ol>
<b>I9990300</b> (Boot Sequence could not be retrieved from BMC using default boot sequence)	<ol style="list-style-type: none"> <li>1. Reseat microprocessor.</li> <li>2. Reseat management module.</li> </ol>
<b>I9990301</b> (Hard disk sector error)	<ol style="list-style-type: none"> <li>1. Hard disk drive</li> <li>2. SCSI backplane</li> <li>3. Cable</li> <li>4. System board assembly</li> </ol>
<b>I9990305</b> (Hard disk sector error, no operating system installed)	<ul style="list-style-type: none"> <li>• <b>Install operating system to hard disk.</b></li> </ul>
<b>I9990306</b> (Timed out waiting on Boot Permission from Management Module)	<ol style="list-style-type: none"> <li>1. Reseat microprocessor.</li> <li>2. Reseat management module.</li> </ol>
<b>I9990650</b> (AC power has been restored)	<ol style="list-style-type: none"> <li>1. Check cable.</li> <li>2. Check for interruption of power.</li> <li>3. Power cable.</li> </ol>

## Light Path Diagnostics

Lit blade-error LED	Cause	Action
<b>None</b>	An error has occurred and cannot be isolated, or the service processor has failed.	<ul style="list-style-type: none"> <li>• 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.</li> </ul>

Lit blade-error LED	Cause	Action
<b>DIMM x error</b>	A memory error occurred.	<ol style="list-style-type: none"> <li>1. Reseat the DIMM indicated by the lit DIMM failure LED.</li> <li>2. Replace the DIMM.</li> </ol> <p>— <b>NOTE</b> 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.</p>
<b>Processor x error</b>	The microprocessor has failed.	<ol style="list-style-type: none"> <li>1. Verify that the microprocessor indicated by the lit LED is installed correctly. (See “Installing an additional processor” on page 25 for installation instructions).</li> <li>2. Replace the microprocessor.</li> </ol>
<b>Temperature error</b>	The system temperature has exceeded a threshold level.	<ol style="list-style-type: none"> <li>1. Check to see if a blower on the SBCE unit has failed. If it has, replace the fan.</li> <li>2. Make sure the room temperature is not too high. (See “Features and specifications” on page 4 for temperature information.)</li> </ol>
<b>System board error</b>	The system board has failed	<ol style="list-style-type: none"> <li>1. Replace the blade server cover, reinsert the blade server in the SBCE unit, and then restart the server.</li> <li>2. Replace the system board assembly.</li> </ol>
<b>NMI error</b>	The system board has failed.	<ol style="list-style-type: none"> <li>1. Replace the blade server cover, reinsert the blade server in the SBCE unit, and then restart the blade server.</li> <li>2. Check the system error log for information about the error.</li> </ol> <p>If the problem remains, replace the system board assembly.</p>
<b>Processor mismatch</b>	The processors do not match.	<ul style="list-style-type: none"> <li>• 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 110.</li> </ul>

## Error symptoms

You can use the error symptom table to find solutions to problems that have definite symptoms. If you have just added new software or a new option and the 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 the 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, reseal the component and replace it if necessary. The most likely cause of the symptom is listed first.

<p>⇒ <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>CD-ROM drive problems</p>	
Symptom	FRU/action
CD-ROM drive is not recognized.	<ol style="list-style-type: none"> <li>1. Verify that: <ul style="list-style-type: none"> <li>• All cables and jumpers are installed correctly.</li> <li>• The correct device driver is installed for the CD-ROM drive.</li> </ul> </li> <li>2. CD-ROM drive.</li> </ol>
CD is not working properly.	<ol style="list-style-type: none"> <li>1. Clean the CD.</li> <li>2. CD-ROM drive.</li> </ol>
CD-ROM drive tray is not working.	<p>⇒ <b>NOTE</b> Blade server must have ownership of CD-ROM drive.</p> <ol style="list-style-type: none"> <li>1. Insert the end of a straightened paper clip into the manual tray-release opening.</li> <li>2. CD-ROM drive.</li> </ol>
CD-ROM drive is seen as /dev/sr0 by SuSE. (If the SuSE Linux operating system is installed remotely onto a blade server that is not the current owner of the media tray (CD-ROM drive, diskette drive, and USB port), SuSE sees the CD-ROM drive as /dev/sr0 instead of /dev/cdrom.)	<ul style="list-style-type: none"> <li>• Establish a link between /dev/sr0 and /dev/cdrom as follows: <ol style="list-style-type: none"> <li>1. Enter the following command: <pre>rm /dev/cdrom; ln -s /dev/sr0 /dev/cdrom</pre> </li> <li>2. Insert the following line in the /etc/fstab file: <pre>/dev/cdrom /media/cdrom auto ro,noauto,user,exec 0 0</pre> </li> </ol> </li> </ul>

<p>— <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>CD-ROM drive problems</p>	
Symptom	FRU/action
<p>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).)</p>	<p>— <b>NOTE</b> 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.</p> <ul style="list-style-type: none"> <li>• 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: <ol style="list-style-type: none"> <li>1. Double-click the Unplug or Eject Hardware icon in the Windows taskbar at the bottom right of the screen.</li> <li>2. Select USB Floppy and click Stop.</li> <li>3. Select USB Mass Storage Device and click Stop.</li> <li>4. Click Close.</li> </ol> <p>You can now safely switch ownership of the media tray to another blade server.</p> </li> </ul>

<p>— <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Diskette drive problems</p>	
Symptom	FRU/action
<p>Diskette drive activity LED stays on, or the system bypasses the diskette drive.</p>	<ol style="list-style-type: none"> <li>1. <b>If there is a diskette in the drive, verify that:</b> <ul style="list-style-type: none"> <li>• The diskette is inserted correctly in the drive.</li> <li>• The diskette is good and not damaged. (Try another diskette if you have one.) <ul style="list-style-type: none"> <li>— The drive light comes on (one-second flash) when the diskette is inserted.</li> </ul> </li> <li>• The diskette contains the necessary files to start the computer.</li> <li>• The diskette drive is enabled in the Configuration/Setup utility program.</li> <li>• The software program is working properly.</li> <li>• The cable is installed correctly (in the proper orientation).</li> </ul> </li> <li>2. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.).</li> <li>3. Cable.</li> <li>4. Diskette drive.</li> <li>5. Media tray card.</li> </ol>

<p>— <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Expansion enclosure problems</p>	
Symptom	FRU/action
The SCSI storage expansion unit used to work but does not work now.	<ol style="list-style-type: none"> <li>1. Verify that the enclosure is installed correctly.</li> <li>2. For more information, see the SCSI storage expansion unit documentation.</li> </ol>

<p>— <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Hard disk drive problems</p>	
Symptom	FRU/action
Not all drives are recognized by the hard disk drive diagnostic test (Fixed Disk test).	<ol style="list-style-type: none"> <li>1. Remove the first drive not recognized and try the hard disk drive diagnostic test again.</li> <li>2. If the remaining drives are recognized, replace the drive you removed with a new one.</li> </ol>
System stops responding during hard disk drive diagnostic test.	<ol style="list-style-type: none"> <li>1. Remove the hard disk drive being tested when the computer stopped responding and try the diagnostic test again.</li> <li>2. If the hard disk drive diagnostic test runs successfully, replace the drive you removed with a new one.</li> </ol>

<p>— <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>General problems</p>	
Symptom	FRU/action
Problems such as broken cover locks or indicator LEDs not working	<ul style="list-style-type: none"> <li>• <b>Broken CRU/FRU</b></li> </ul>



<p><b>= NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
Intermittent problems	
Symptom	FRU/action
A problem occurs only occasionally and is difficult to detect.	<ul style="list-style-type: none"> <li>• <b>Verify that:</b> <ul style="list-style-type: none"> <li>— 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.</li> <li>— Ensure that the SCSI bus and devices are configured correctly.</li> </ul> </li> </ul>

<p><b>= NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
Keyboard, mouse, or pointing-device problems	
Symptom	FRU/action
All or some keys on the keyboard do not work.	<ol style="list-style-type: none"> <li>1. Verify that: <ul style="list-style-type: none"> <li>• The keyboard cable is securely connected to the SBCE management module, and the keyboard and mouse cables are not reversed.</li> <li>• Both the computer and the monitor are turned on.</li> </ul> </li> <li>2. Keyboard.</li> <li>3. Management module on the SBCE unit.</li> </ol>
The mouse or pointing device does not work.	<ol style="list-style-type: none"> <li>1. Verify that: <ul style="list-style-type: none"> <li>• 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.</li> <li>• The mouse or pointing-device cable is securely connected to the SBCE management module, and that the keyboard and mouse cables are not reversed.</li> <li>• The mouse works correctly with other blade servers.</li> <li>• The mouse device drivers are installed correctly.</li> <li>• Both the computer and the monitor are turned on.</li> <li>• The mouse is recognized as a USB device, not PS2, by the 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.</li> </ul> </li> <li>2. Mouse or pointing device.</li> <li>3. Management module on the SBCE unit.</li> </ol>

**NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

**Keyboard, mouse, or pointing-device problems**

Symptom	FRU/action
Mouse function lost during Red Hat installation.	<ul style="list-style-type: none"><li>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).</li></ul>

**NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

**Memory problems**

Symptom	FRU/action
The amount of system memory displayed is less than the amount of physical memory installed.	<ol style="list-style-type: none"><li>Verify that:<ul style="list-style-type: none"><li>The memory modules are seated properly.</li><li>You have installed the correct type of memory.</li><li>If you changed the memory, you updated the memory configuration with the Configuration/Setup Utility program.</li><li>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.</li></ul></li><li>Check POST error log for error message 289:<ul style="list-style-type: none"><li>If the DIMM was disabled by a system-management interrupt (SMI), replace the DIMM.</li><li>If the DIMM was disabled by the user or by POST:<ol style="list-style-type: none"><li>Start the Configuration/Setup Utility program.</li><li>Enable the DIMM.</li><li>Save the configuration and restart the computer.</li></ol></li></ul></li><li>DIMM.</li><li>System board assembly.</li></ol>

<p>⇒ <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p><b>Microprocessor problems</b></p>	
Symptom	FRU/action
The blade server emits a continuous tone during POST. (The startup (boot) microprocessor is not working properly.)	<ol style="list-style-type: none"> <li>1. Verify that the startup microprocessor is seated properly.</li> <li>2. Startup microprocessor.</li> </ol>

<p>⇒ <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p><b>Monitor problems</b></p>	
Symptom	FRU/action
Testing the monitor.	<ul style="list-style-type: none"> <li>• <b>See the information that comes with the monitor</b> for adjusting and testing instructions. (Some monitors have their own self-tests.)</li> </ul>
The screen is blank.	<ol style="list-style-type: none"> <li>1. Verify that: <ul style="list-style-type: none"> <li>• 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 monitor.</li> <li>• The system power cord is plugged into the SBCE power module and a working electrical outlet.</li> <li>• The monitor cables are connected properly.</li> <li>• The monitor is turned on and the Brightness and Contrast controls are adjusted correctly.</li> </ul> <p>⇒ <b>Important</b></p> <p>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 <b>Boot Fail Count</b> feature in the Start Options of the Configuration/Setup Utility program is set to <b>Enabled</b> (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).</p> </li> <li>2. If you have verified these items and the screen remains blank, replace: <ol style="list-style-type: none"> <li>a. Monitor</li> <li>b. Management module on the SBCE unit (see the <i>Intel® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide</i>).</li> </ol> </li> </ol>
Only the cursor appears.	<ul style="list-style-type: none"> <li>• <b>Verify that</b> the keyboard, video and mouse on the SBCE unit have not been switched to another blade server. If the problem remains, see “Undetermined problems” on page 126.</li> </ul>

— **NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

**Monitor problems**

Symptom	FRU/action
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.	<ul style="list-style-type: none"> <li>• <b>Verify that</b> 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 the 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 <i>Intel® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide</i>.</li> </ul>
The screen is wavy, unreadable, rolling, distorted, or has screen jitter.	<ol style="list-style-type: none"> <li>1. <b>If the monitor self-tests show the monitor is working properly, consider the location of the monitor.</b> 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:               <ol style="list-style-type: none"> <li>a. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.).</li> <li>b. Monitor cables might cause unpredictable problems.</li> </ol> </li> <li>2. Monitor.</li> <li>3. System board assembly.</li> </ol>
Wrong characters appear on the screen.	<ol style="list-style-type: none"> <li>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.</li> <li>2. Monitor.</li> <li>3. System board assembly.</li> </ol>
No video.	<ol style="list-style-type: none"> <li>1. Make sure the correct machine is selected, if applicable.</li> <li>2. Make sure all cables are locked down.</li> </ol>

**NOTE**

See "System" on page 130 to determine which components should be replaced by a field service technician.

**Option problems**

Symptom	FRU/action
An option that was just installed does not work.	<ol style="list-style-type: none"><li>1. Verify that:<ul style="list-style-type: none"><li>• The option is designed for the computer.</li><li>• You followed the installation instructions that came with the option.</li><li>• The option is installed correctly.</li><li>• You have not loosened any other installed options or cables and that all option hardware and cable connections are secure.</li><li>• If the failing option is a SCSI storage expansion unit:<ul style="list-style-type: none"><li>— The cables for the SCSI expansion unit are connected correctly.</li><li>— If the SCSI storage expansion unit has been removed, verify that the socket is terminated correctly.</li><li>— The external SCSI expansion unit is turned on. You must turn on the external SCSI expansion unit before turning on the computer.</li></ul></li><li>• You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration.</li></ul></li><li>2. If the option comes with its own test instructions, use those instructions to test the option.</li><li>3. Replace the option you just installed.</li></ol>

**NOTE**

See "System" on page 130 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.	<ol style="list-style-type: none"><li>1. Reseat connector.</li><li>2. Front bezel with customer card.</li><li>3. System board assembly.</li></ol>

**NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

**Power problems**

Symptom	FRU/action
<p>The blade server does not turn on.</p>	<ol style="list-style-type: none"> <li>1. Verify that:               <ol style="list-style-type: none"> <li>a. The power LED on the front of the SBCE unit is on.</li> <li>b. The LEDs on all the SBCE power modules are on.</li> <li>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.</li> <li>d. The power-on LED on the blade server control panel is blinking slowly.                   <ul style="list-style-type: none"> <li>• If the power LED is blinking rapidly and continues to do so, the blade server is not communicating with the management module; reseal the blade server, then go to step &lt;\$elemparamumonly&lt;\$elemparamumonly&lt;\$elemparamumonly</li> <li>• 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.</li> </ul> </li> <li>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.</li> </ol> </li> <li>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 might have installed more options than the power to that blade bay supports.</li> <li>3. Try another blade server in the blade bay; if it works, replace the faulty blade server.</li> <li>4. See “Undetermined problems” on page 126.</li> </ol>
<p>The blade server does not turn on and the following conditions are present:</p> <ol style="list-style-type: none"> <li>1. The amber system error LED on the SBCE unit’s system LED panel is lit;</li> <li>2. The amber blade error LED on the blade server’s LED panel is lit; and</li> <li>3. The system error log contains the message “CPUs mismatched”.</li> </ol>	<ul style="list-style-type: none"> <li>• The microprocessor with the lowest feature set must be used as the Bootstrap Processor (microprocessor 1 in location U66; see “System board component locations” on page 49). Move the microprocessor in location U66 to location U70, and move the microprocessor in location U70 to location U66.</li> </ul>

— **NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

**Power problems**

Symptom	FRU/action
The blade server turns off for no apparent reason	<ol style="list-style-type: none"><li>1. <b>Verify that all blade bays have a blade server, expansion unit, or filler blade properly installed.</b> If these components are missing or improperly installed, an over-temperature condition may result in shutdown.</li><li>2. If microprocessor LED is illuminated, replace the microprocessor.</li></ol>
The computer does not turn off.	<ol style="list-style-type: none"><li>1. <b>Verify whether you are using an ACPI or non-ACPI operating system.</b> If you are using a non-ACPI operating system:<ol style="list-style-type: none"><li>a. Press Ctrl+Alt+Delete.</li><li>b. Turn off the system by holding the power-control button for 4 seconds.</li><li>c. If computer fails during BIOS POST and power-control button does not work, remove the blade server from the bay and reseal it.</li></ol></li><li>2. If the problem remains or if you are using an ACPI-aware operating system, suspect the system board assembly.</li></ol>

— **NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

**Server problems**

Symptom	FRU/action
The SCSI RAID program cannot view all installed drives, or the operating system cannot be installed.	<ul style="list-style-type: none"><li>• Make sure that there are no duplicate SCSI IDs or IRQ assignments.</li><li>• Make sure that the hard disk drive is connected correctly.</li></ul>
The operating-system installation program continuously loops.	Make more space available on the hard disk.
The operating system cannot be installed; the option is not available.	Make sure that the operating system is supported on the server. If the operating system is supported, either there is no logical drive defined (SCSI RAID systems) or the ServerGuide System Partition is not present. Run the ServerGuide program and make sure that setup is complete.

<p>⇒ <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p><b>Software problem</b></p>	
Symptom	FRU/action
<p>Suspected software problem.</p>	<p>1. To determine if problems are caused by the software, verify that:</p> <ul style="list-style-type: none"> <li>• The computer has the minimum memory needed to use the software. For memory requirements, see the information that comes with the software.</li> </ul> <p style="margin-left: 40px;">⇒ <b>NOTE</b> If you have just installed an adapter or memory, you might have a memory address conflict.</p> <ul style="list-style-type: none"> <li>• The software is designed to operate on the computer.</li> <li>• Other software works on the computer.</li> <li>• The software that you are using works on another system.</li> </ul> <p>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.</p> <p>2. If you have verified these items and the problem remains, contact your place of purchase.</p>

<p>⇒ <b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p><b>Universal Serial Bus (USB) port problems</b></p>	
Symptom	FRU/action
<p>A USB device does not work.</p>	<ul style="list-style-type: none"> <li>• <b>Verify that:</b> <ul style="list-style-type: none"> <li>— The correct USB device driver is installed.</li> <li>— The operating system supports USB devices.</li> </ul> </li> </ul>



<p><b>⇒ NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<b>Network connection problems</b>	
Symptom	FRU/action
One or more blade servers are unable to communicate with the network.	<p><b>Verify that:</b></p> <ul style="list-style-type: none"> <li>• The switch modules for the network interface being used are installed in the correct SBCE bays and are configured and operating correctly. See the <i>Intel® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide</i> on the Intel® Blade Server Chassis SBCE Resource CD for details.</li> <li>• The settings in the switch module are appropriate for the blade server (settings in the switch module are blade-specific).</li> </ul> <p>If you installed an I/O expansion option, verify that:</p> <ul style="list-style-type: none"> <li>• The option is designed for the blade server.</li> <li>• You followed the installation instructions that came with the option.</li> <li>• The option is installed correctly.</li> <li>• You have not loosened any other installed options or cables.</li> <li>• You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration.</li> </ul> <p>If the problem remains, see “Undetermined problems” on page 126.</p>

<p><b>⇒ NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<b>Service processor problems</b>	
Symptom	FRU/action
Service processor in the management module reports a general monitor failure.	<ul style="list-style-type: none"> <li>• 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 126 and the <i>Intel® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide</i> on the Intel® Blade Server Chassis SBCE Resource CD.</li> </ul>

## Service processor error codes

**⇒ NOTE**

These codes are viewed in the SBCE management module log. The baseboard management controller (BMC) system event log contains up to 512 of the most recent service processor errors in IPMI format. These messages are a combination of plain text and

error code numbers. You can view the BMC system event log from the Configuration/Setup Utility menu by selecting **Advanced Setup > Baseboard Management Controller (BMC) Settings > BMC System Event Log**.

You can view additional information and error codes in plain text by viewing the SBCE Management Module event log. This log can be accessed from the Configuration/Setup Utility menu by selecting **Error Logs** option, or directly from the SBCE Management Module.

## SCSI error codes

Error code	FRU/action
<p><b>All SCSI Errors</b> One or more of the following might be causing the problem:</p> <ul style="list-style-type: none"> <li>A failing SCSI device (adapter, drive)</li> <li>An improper SCSI configuration</li> <li>Duplicate SCSI IDs in the same SCSI chain</li> </ul>	<ul style="list-style-type: none"> <li><b>Verify that the SCSI devices are configured correctly.</b></li> </ul>

## Temperature error messages

<p><b>NOTE</b> See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
Message	Action
<b>System over temperature for CPU x.</b>	<ol style="list-style-type: none"> <li><b>Ensure that the system is being properly cooled;</b> see “System reliability considerations” on page 17.</li> <li>Replace microprocessor <i>x</i>.</li> </ol>
<b>Blade Storage Expansion option over recommended temperature.</b>	<ol style="list-style-type: none"> <li><b>Ensure that the system is being properly cooled;</b> see “System reliability considerations” on page 17.</li> <li>Replace the SCSI hard disk drives.</li> <li>Replace the Blade Storage Expansion option.</li> </ol>
<b>CPU x over temperature.</b>	<ol style="list-style-type: none"> <li><b>Ensure that the system is being properly cooled;</b> see “System reliability considerations” on page 17.</li> <li>Replace microprocessor <i>x</i>.</li> </ol>

## Power error messages

= NOTE	
See “System” on page 130 to determine which components should be replaced by a field service technician.	
Message	Action
<b>BSE +12V over recommended voltage</b>	<ol style="list-style-type: none"> <li>1. <b>Check SBCE power</b> (see the <i>Intel® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide</i> on the Intel® Blade Server Chassis SBCE Resource CD for details).</li> <li>2. Reseat blade storage expansion option.</li> <li>3. Replace blade storage expansion option.</li> </ol>
<b>BSE +12V under recommended voltage</b>	<ol style="list-style-type: none"> <li>1. Reseat blade storage expansion option.</li> <li>2. Replace blade storage expansion option.</li> </ol>
<b>BSE +5V over recommended voltage</b>	<ol style="list-style-type: none"> <li>1. Reseat blade storage expansion option.</li> <li>2. Replace blade storage expansion option.</li> </ol>
<b>BSE +5V under recommended voltage</b>	<ol style="list-style-type: none"> <li>1. Reseat blade storage expansion option.</li> <li>2. Replace blade storage expansion option.</li> </ol>
<b>BSE +18V over recommended voltage</b>	<ol style="list-style-type: none"> <li>1. Reseat blade storage expansion option.</li> <li>2. Replace blade storage expansion option.</li> </ol>
<b>BSE +18V under recommended voltage</b>	<ol style="list-style-type: none"> <li>1. Reseat blade storage expansion option.</li> <li>2. Replace blade storage expansion option.</li> </ol>
<b>BSE +3.3V over recommended voltage</b>	<ol style="list-style-type: none"> <li>1. Reseat blade storage expansion option.</li> <li>2. Replace blade storage expansion option.</li> </ol>
<b>BSE +3.3V under recommended voltage</b>	<ol style="list-style-type: none"> <li>1. Reseat blade storage expansion option.</li> <li>2. Replace blade storage expansion option.</li> </ol>
<b>BSE +2.5V over recommended voltage</b>	<ol style="list-style-type: none"> <li>1. Reseat blade storage expansion option.</li> <li>2. Replace blade storage expansion option.</li> </ol>
<b>BSE +2.5V under recommended voltage</b>	<ol style="list-style-type: none"> <li>1. Reseat blade storage expansion option.</li> <li>2. Replace blade storage expansion option.</li> </ol>
<b>BSE +1.8V over recommended voltage</b>	<ol style="list-style-type: none"> <li>1. Reseat blade storage expansion option.</li> <li>2. Replace blade storage expansion option.</li> </ol>
<b>BSE +1.8V under recommended voltage</b>	<ol style="list-style-type: none"> <li>1. Reseat blade storage expansion option.</li> <li>2. Replace blade storage expansion option.</li> </ol>
<b>System Power Good fault</b>	<ol style="list-style-type: none"> <li>1. <b>Check SBCE power</b> (see the <i>Intel® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide</i> on the Intel® Blade Server Chassis SBCE Resource CD for details).</li> <li>2. Reseat blade server.</li> <li>3. Replace blade server.</li> </ol>

**NOTE**

See “System” on page 130 to determine which components should be replaced by a field service technician.

Message	Action
<b>VRM Power Good fault</b>	<ol style="list-style-type: none"> <li>1. <b>Check SBCE power</b> (see the <i>Intel® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide</i> on the Intel® Blade Server Chassis SBCE Resource CD for details).</li> <li>2. Reseat blade server.</li> <li>3. Replace blade server.</li> </ol>
<b>System over recommended voltage for +12v.</b>	<ol style="list-style-type: none"> <li>1. <b>Check SBCE power</b> (see the <i>Intel® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide</i> on the Intel® Blade Server Chassis SBCE Resource CD for details).</li> <li>2. Reseat blade server.</li> <li>3. Replace blade server.</li> </ol>
<b>System over recommended voltage for +1.25v.</b>	<ol style="list-style-type: none"> <li>1. Reseat blade server.</li> <li>2. Replace blade server.</li> </ol>
<b>System over recommended voltage for +1.5v.</b>	<ol style="list-style-type: none"> <li>1. Reseat blade server.</li> <li>2. Replace blade server.</li> </ol>
<b>System over recommended voltage for +2.5v.</b>	<ol style="list-style-type: none"> <li>1. Reseat blade server.</li> <li>2. Replace blade server.</li> </ol>
<b>System over recommended voltage for +3.3v.</b>	<ol style="list-style-type: none"> <li>1. Reseat blade server.</li> <li>2. Replace blade server.</li> </ol>
<b>System over recommended 5V fault.</b>	<ol style="list-style-type: none"> <li>1. Reseat blade server.</li> <li>2. Replace blade server.</li> </ol>
<b>VRM voltage over recommended tolerance.</b>	<ol style="list-style-type: none"> <li>1. Reseat blade server.</li> <li>2. Replace blade server.</li> </ol>
<b>System under recommended voltage for +12v.</b>	<ol style="list-style-type: none"> <li>1. <b>Check SBCE power</b> (see the <i>Intel® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide</i> on the Intel® Blade Server Chassis SBCE Resource CD for details).</li> <li>2. Reseat blade server.</li> <li>3. Replace blade server.</li> </ol>
<b>System under recommended voltage for +1.25v.</b>	<ol style="list-style-type: none"> <li>1. Reseat blade server.</li> <li>2. Replace blade server.</li> </ol>
<b>System under recommended voltage for +1.5v.</b>	<ol style="list-style-type: none"> <li>1. Reseat blade server.</li> <li>2. Replace blade server.</li> </ol>
<b>System under recommended voltage for +2.5v.</b>	<ol style="list-style-type: none"> <li>1. Reseat blade server.</li> <li>2. Replace blade server.</li> </ol>
<b>System under recommended voltage for +3.3v.</b>	<ol style="list-style-type: none"> <li>1. Reseat blade server.</li> <li>2. Replace blade server.</li> </ol>

<b>= NOTE</b> See "System" on page 130 to determine which components should be replaced by a field service technician.	
Message	Action
<b>System under recommended 5V fault.</b>	<ol style="list-style-type: none"> <li>1. Reseat blade server.</li> <li>2. Replace blade server.</li> </ol>

## System shutdown

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

## System errors

<b>= NOTE</b> See "System" on page 130 to determine which components should be replaced by a field service technician.	
Message	Action
<b>Internal Error CPU x fault</b>	<ol style="list-style-type: none"> <li>1. Reseat:             <ol style="list-style-type: none"> <li>a. I/O Expansion Option</li> <li>b. Blade Storage Expansion option.</li> <li>c. Hard disk drive.</li> </ol> </li> <li>2. Replace:             <ol style="list-style-type: none"> <li>a. Failing PCI adapter</li> <li>b. Microprocessor x.</li> <li>c. I/O Expansion Option.</li> <li>d. Blade Storage Expansion option.</li> <li>e. Hard disk drive.</li> <li>f. System board assembly.</li> </ol> </li> </ol>

## Temperature-related system shutdown

= NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.	
Message	Action
<b>System shutoff due to CPU x over temperature</b>	<ol style="list-style-type: none"> <li>1. <b>Ensure that the system is being properly cooled;</b> see “System reliability considerations” on page 17.</li> <li>2. Replace microprocessor x.</li> </ol>
<b>System shutoff due to Blade Storage Expansion option temperature</b>	<ol style="list-style-type: none"> <li>1. <b>Ensure that the system is being properly cooled;</b> see “System reliability considerations” on page 17.</li> <li>2. Replace Blade Storage Expansion option.</li> </ol>
<b>CPU x shut off due to over temperature</b>	<ol style="list-style-type: none"> <li>1. <b>Ensure that the system is being properly cooled;</b> see “System reliability considerations” on page 17.</li> <li>2. Replace microprocessor x.</li> </ol>
<b>Critical Blower Failure, blade server powering down</b>	<ul style="list-style-type: none"> <li>• See the <i>Intel® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide on the Intel® Blade Server Chassis SBCE Resource CD.</i></li> </ul>
<b>Power Modules are over temperature, blade server powering down</b>	<ul style="list-style-type: none"> <li>• See the <i>Intel® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide on the Intel® Blade Server Chassis SBCE Resource CD.</i></li> </ul>

## DASD checkout

= NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.	
Message	Action
<b>Hard drive x removal detected</b> (level-critical; hard drive x has been removed)	<ul style="list-style-type: none"> <li>• <b>Information only, take action as appropriate.</b></li> </ul>

## Undetermined problems

### = NOTE

When troubleshooting a problem with the Intel Server Compute Blade SBX82, 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® Blade Server Chassis SBCE: Hardware Maintenance Manual and Troubleshooting Guide* on the Intel® Blade Server Chassis SBCE Resource CDD.
- **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 67).

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 assembly
  - b. One microprocessor
  - c. Memory (with a minimum of two 256 MB DIMMs)
  - d. A functioning SBCE unit
6. Install and turn on the blade server. If the problem remains, suspect the following FRUs in the order listed:
    - DIMM
    - System board assembly
    - 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 assembly.
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.

- 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 model
  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.



# 9 Parts listing, Intel® Server Compute Blade SBX82

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This parts listing supports the Intel® Server Compute Blade SBX82.

— **NOTE**

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

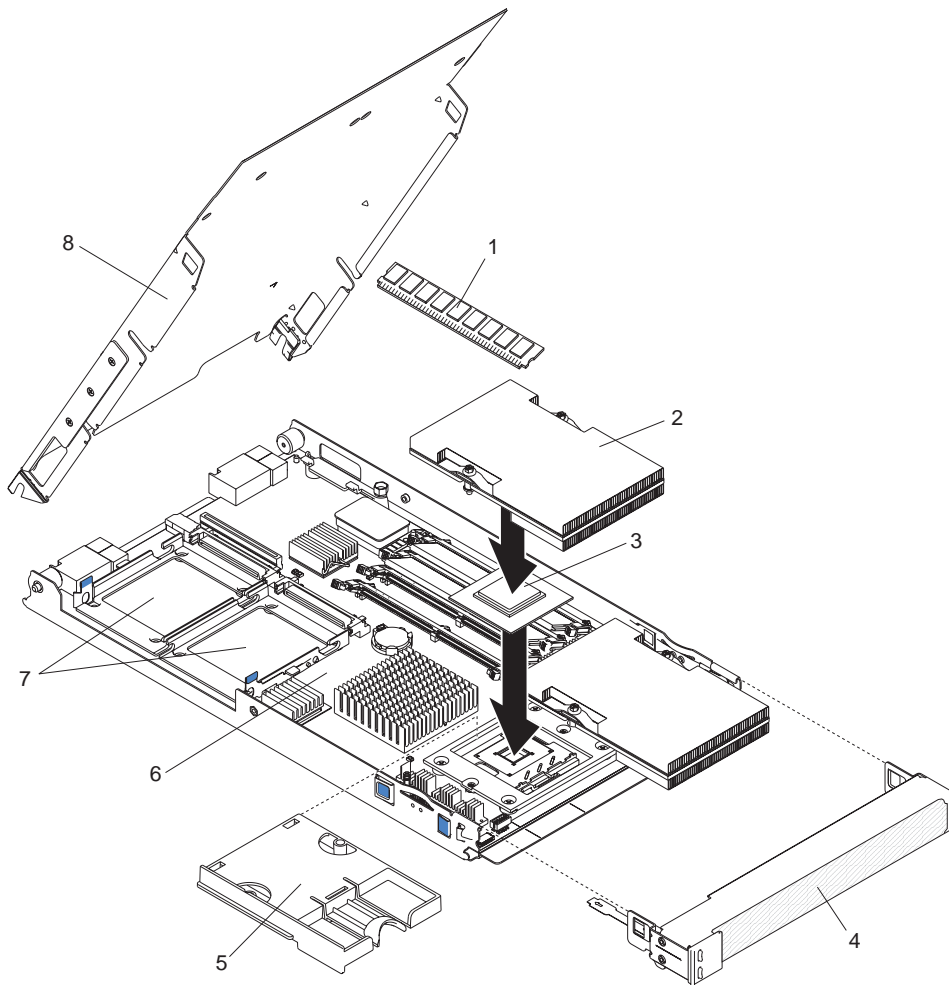


Figure 29. Blade server – exploded view

# System

## — NOTES

- Field replaceable units (FRUs) must be serviced only by qualified field service technicians.
- Customer replaceable units (CRUs) can be replaced by the customer.

Index	SBX82 Customer and Field Replaceable Units	CRU	FRU
1	Memory, 1 GB PC3200 ECC DDR	x	
1	Memory, 2 GB PC3200 ECC DDR	x	
1	Memory, 256 MB PC3200 ECC DDR	x	
1	Memory, 512 MB PC3200 ECC DDR	x	
1	Memory, 512 MB PC3200 ECC DDR	x	
2	Heat sink, microprocessor		x
3	Microprocessor 800/2.8-1 MB		x
3	Microprocessor 800/3.0-1 MB		x
3	Microprocessor 800/3.2-1 MB		x
3	Microprocessor 800/3.4-1 MB		x
3	Microprocessor 800/3.6-1 MB		x
4	Front bezel with LEDs and switches	x	
5	Filler, microprocessor heat sink	x	
6	System board assembly		x
7	Hard disk drive, 36 GB SCSI	x	
7	Hard disk drive, 73 GB SCSI	x	
8	Cover and label	x	
	Battery, 3.0 volt	x	
	Blade Storage Expansion Unit	x	
	Door, Blade Storage Expansion Unit	x	
	Gigabit Ethernet expansion card	x	
	Gigabit Ethernet expansion card, SFF	x	
	Fibre channel expansion card	x	
	Fibre channel expansion card SFF	x	
	Filler, Blade Storage Expansion Unit	x	
	Label, Blade Storage Expansion Unit, system service	x	
	Label, FRU list	x	
	Label, system service	x	
	Tray, expansion card	x	
	Tray, SCSI hard disk drive	x	

# A Getting help and technical assistance

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If you need help, technical assistance, or just want more information about Intel® products, you will find a wide variety of sources available from Intel to assist you. This appendix contains information about where to go for additional information about Intel and Intel products, and what to do if you experience a problem with your blade server system.

## 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 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 Intel® systems and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes.

## Using the documentation

Information about your Intel® Server Compute Blade SBX82 is available in the documentation that comes with your system. That documentation may include 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. Use the Intel Business Link (IBL) website or contact your Intel support representative to obtain the latest technical information and download device drivers and updates.

## Getting help and information from the World Wide Web

IBL includes up-to-date information about the Intel® Server Compute Blade SBX82. The IBL website is located at <http://www.intel.com/ibl>. You may also find support at the Intel support site: <http://support.intel.com/support/motherboards/server/blade.htm>.



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