

Intel[®] Server Compute Blade SBX44: Hardware Maintenance Manual and Troubleshooting Guide

A Guide for Technically Qualified Assemblers of Intel[®] Identified Subassemblies/Products

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When translations of this guide are available, you can find them at the following URL:
<http://support.intel.com/support/motherboards/server/>

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About this manual

This manual contains diagnostic information, a Symptom-to-FRU index, service information, error codes, error messages, and configuration information for the Intel® Server Compute Blade SBX44.

⇒ Important

- The field replaceable unit (FRU) procedures are intended for trained servicers who are familiar with Intel® blade products. See the parts listing in Chapter 6, “Parts listing, Server Compute Blade SBX44,” on page 129 to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU.

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Safety and regulatory information

– NOTE

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

Important Safety Instructions

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

Wichtige Sicherheitshinweise

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

重要安全指导

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

Consignes de sécurité

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

Instrucciones de seguridad importantes

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

General Safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.
Remember: Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

Electrical Safety

CAUTION:

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

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

- Disconnect all power before performing a mechanical inspection.
- Before you start to work on the machine, unplug the power cord. or power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- Never assume that power has been disconnected from a circuit. First, check that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of an inspection mirror. The surface is conductive; such touching can cause personal injury and machine damage.

Handling electrostatic discharge-sensitive devices

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

CAUTION:

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

- Throw or immerse into water
- Heat to more than 100×C (212×F)
- Repair or disassemble
- Dispose of the battery as required by local ordinances or regulations.

CAUTION:

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

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

DANGER

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

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

CAUTION:

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

System Reliability Considerations

To help ensure proper cooling and system reliability:

- Make sure that all microprocessor sockets always contain either a microprocessor heat sink filler or a microprocessor and heat sink.
- Make sure that the clear plastic air baffle is properly installed over the retention mechanism assembly.

Regulatory specifications and disclaimers

Safety compliance

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

Australia/New Zealand:	CB Report to IEC 60950, 3rd Edition plus international deviations
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Electromagnetic compatibility (EMC)

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

Electromagnetic compatibility notice (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 own expense.

Electromagnetic compatibility notices (International)

Europe (CE Declaration of Conformity): This product has been tested in accordance to, 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", NBM-003 édictée par le Ministre Canadian des Communications.

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

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

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

RRL Korea:

기종명	비고
A급 기기	이 기기는 업무용으로 전자파 적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 관와 잘못구매 또는 구입하였을 때에는 가맹점으로 교환하시기 바랍니다.
B급 기기	이 기기는 가정용으로 전자파 적합등록을 한 기기로서 주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

비고

A급 기기 : 업무용 정보통신기기를 말한다.

B급 기기 : 가정용 정보통신기기를 말한다.

English translation of the previous notice:

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

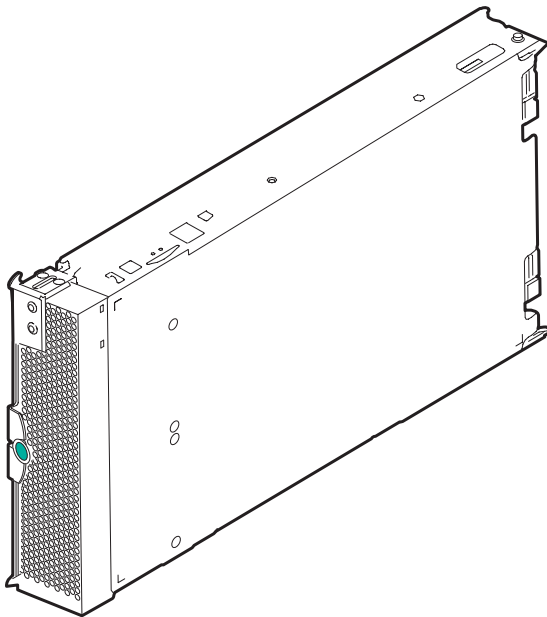
1 General information

The Intel® Server Compute Blade SBX44 is a blade-model server that is one of up to 7 blades that can be installed in the Intel® Server Chassis SBCE. This high-performance blade server is ideally suited for networking environments that require superior microprocessor performance, efficient memory management, flexibility, and reliable data storage.

The serial number is located on the ID label that is behind the control panel door on the front of the blade, and on a label on the left side of the blade that is visible when the blade server is not in the system chassis.

— **NOTE**

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



TP00390

Related publications

This *Hardware Maintenance Manual and Troubleshooting Guide* is provided in Portable Document Format (PDF). It contains information to help you solve a problem yourself or to provide helpful information to a service technician.

In addition to this *Hardware Maintenance Manual and Troubleshooting Guide*, the following documentation is provided on the *Resource CD* that comes with the system chassis:

- *Safety Information*: This publication contains translated caution and danger statements.
- *Intel® Server Compute Blade SBX44: Installation and User's Guide*: This publication provides general information about the blade server, including information about features, how to configure the server, and how to get help.

Depending on your server model, additional publications might be included on the *Resource CD*.

Notices and statements used in this book

The caution and danger statements used in this book also appear in the multilingual *Safety Information* book provided on the *Resource CD*.

The following types of notices and statements are used in this book:

- **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.

Features and specifications

The following table provides a summary of the features and specifications of the Intel® Server Compute Blade SBX44.

— NOTE

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

<p>Microprocessor:</p> <p>Supports up to 4 microprocessors</p> <ul style="list-style-type: none"> • Intel® Xeon™ 2.0 GHz or faster • 1-MB, 2-MB or 4-MB ECC L2 cache <p>Memory:</p> <ul style="list-style-type: none"> • Eight double data rate (DDR) 266 PC1600 sockets operating at 200 MHz • Minimum: 512 MB • Maximum: 16 GB • Type: 2-way interleaved, DDR, PC2100, ECC SDRAM registered x4 (Chipkill) DIMMs only <p>— NOTE PC2100 DIMMs are backward-compatible and can function in the PC1600 sockets</p> <ul style="list-style-type: none"> • Supports 256-MB, 512-MB, 1-GB and 2-GB dual inline memory modules (DIMMs) <p>Drives:</p> <ul style="list-style-type: none"> • Support for up to two internal IDE 2.5-inch hard disk drives • Support for up to two Ultra320 SCSI hot-swap hard disk drives available in an optional SCSI storage expansion unit <p>Expansion:</p> <ul style="list-style-type: none"> • (2) IO expansion card connectors for auxiliary fabric attach point (PCI-X internal interface and SERDES external interface) 	<p>Size:</p> <ul style="list-style-type: none"> • Height: 24.5 cm (9.7 inches) • Depth: 44.6 cm (17.6 inches) • Width: 5.9 cm (2.32 inches) • Maximum weight: 5.4 kg (12 lb) <p>Integrated functions:</p> <ul style="list-style-type: none"> • Four Gigabit Ethernet controllers • ATI* Radeon 7000 video controller • Light Path Diagnostics* • Local service processor • IDE hard disk drive controller • RS-485 interface for communication with chassis management module • Sahalee-based BMC management features • USB buses for communication with keyboard, mouse, diskette drive, and CD-ROM drive • SOL management interface <p>Predictive Failure Analysis (PFA) alerts:</p> <ul style="list-style-type: none"> • Microprocessor • Memory • Hard disk drives <p>BIOS:</p> <ul style="list-style-type: none"> • 2MB flash with rolling BIOS support and 4 MB diagnostic space (8 MB total) 	<p>Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> — Blade server on: 10° to 35°C (50° to 95°F). Altitude: 0 to 914 m (2998.69 ft) — Blade server on: 10° to 32°C (50° to 95°F). Altitude: 914 m to 2134 m (2998.69 ft to 7000 ft) — Blade server off: -40° to 60°C (-40° to 140° F) • Humidity: <ul style="list-style-type: none"> — Blade server on: 8% to 80% — Blade server off: 5% to 80% <p>Electrical input:</p> <ul style="list-style-type: none"> • Input voltage: 12 VDC <p>Power:</p> <ul style="list-style-type: none"> • Dual redundant 12VDC (400W max) <p>Thermal:</p> <ul style="list-style-type: none"> • Enterprise: 40 CFU, 35°C, 1500 m • Telco: 40 CFU, 40°C, 1800 m
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Blade server power, controls, and indicators

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

Turning on the blade server

After you connect the system chassis to AC power, the blade server can start in any of the following ways:

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

Notes:

1. After you plug the power cords of your system chassis into the power distribution unit (PDU), wait until the power-on LED on the blade server flashes slowly before pressing the blade server power-control button. This should take about 20 seconds. During this time, the service processor in the chassis management module is initializing; therefore, the power-control button on the blade server does not respond.
 2. While the server is powering up, the power-on LED on the front of the server is lit.
- If a power failure occurs, the system chassis and then the blade server can start automatically when power is restored (if the blade server is configured through the chassis management module to do so).
 - You can turn on the blade server remotely by means of the service processor in the chassis 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 chassis management module has not disabled the Wake on LAN feature).

— NOTE

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

Turning off the blade server

When you turn off the blade server, it is still powered through the system chassis. 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 system chassis.

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

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

- You can press the power-control button on the blade server (behind the control panel door) if local power is enabled. This starts an orderly shutdown of the operating system, if this feature is supported by your operating system.

— **NOTE**

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

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

— **NOTE**

After turning off the blade server, wait at least 30 seconds for it to stop running (the power light will start blinking) before you remove the blade server from the system chassis.

Improper shutdown of a blade server will not allow that blade server to be restarted using Wake on LAN. To reset the blade server power state and re-enable its previously programmed Wake on LAN capability:

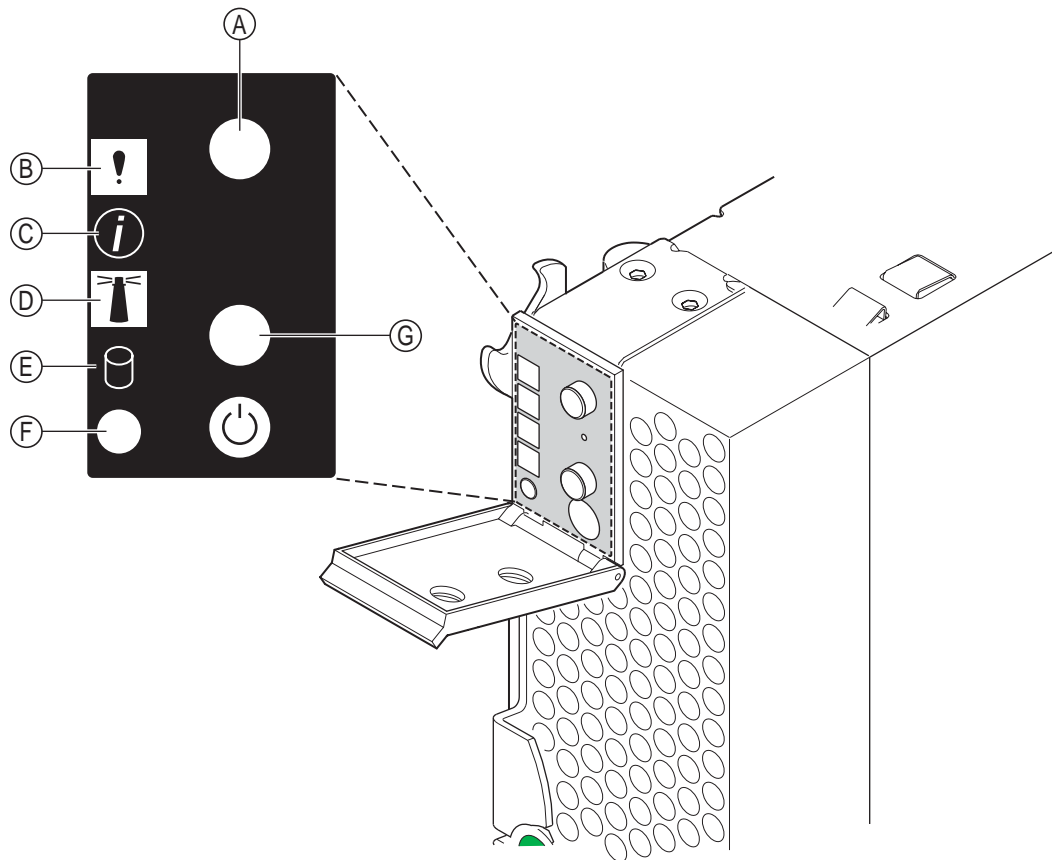
1. Turn off the blade server.
2. Unlatch and slide the blade server partially out of the system chassis.
3. Reinstall the blade server.

Blade server controls and LEDs

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

— **NOTE**

The control panel is shown in the open position in the following illustration.



TP00388

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

— **NOTE**

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

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

— **NOTE**

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

1. The system-error LED might light, and a KVM allocation error might be logged, if the change in ownership for the CD-ROM drive, diskette drive, and USB port, or the keyboard, video, and mouse takes more than 8 seconds. The system-error LED will go off after the ownership change is complete.
2. It can take up to 48 seconds after a blade server is initially turned on before you can attempt to switch KVM control to that blade server.

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

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

Location LED (D): 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 system chassis will also be on.

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

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

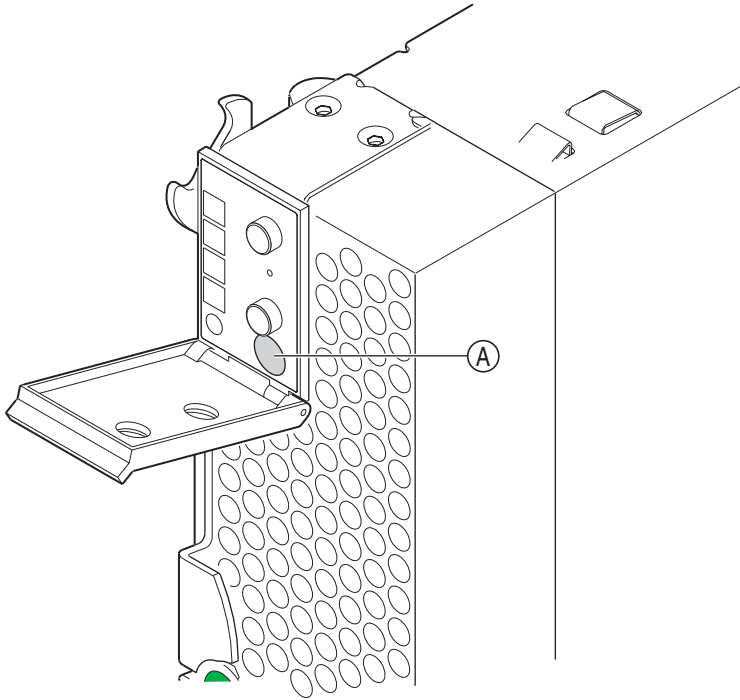
- Flashing rapidly – The service processor on the blade server is handshaking with the chassis management module.
- Flashing slowly – The blade server has power but is not turned on.
- Steady – The blade server has power and is turned on.

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

Notes:

1. The operating system in a blade server must provide USB support for that blade server to recognize and use the keyboard, mouse, CD-ROM drive, and diskette drive. The system chassis uses USB for internal communication with these devices.
2. It can take approximately 20 seconds to switch the keyboard, video, and mouse or the CD-ROM drive, diskette drive, and USB port to the blade server.
 - a. The system-error LED might light, and a KVM allocation error might be logged, if the change in ownership for the CD-ROM drive, diskette drive, and USB port, or the keyboard, video, and mouse takes more than 8 seconds. The system-error LED will go off after the ownership change is complete.
 - b. It can take up to 48 seconds after a blade server is initially turned on before you can attempt to switch KVM control to that blade server.
3. If a blade server is under heavy load, it can take several minutes before it enumerates the USB devices connected to it. If control of the KVM and media tray is switched away from the blade server before this enumeration is complete, a USB device installation error might be received. Do not switch KVM control between blade servers until the mouse and keyboard are both working on the blade server that has control of the KVM and media tray.
4. If you install Microsoft® Windows® 2000 on the blade server while it is not the current owner of the keyboard, video, and mouse, a delay of up to one minute occurs the first time you switch the keyboard, video, and mouse to the blade server. During this one-time-only delay, the blade server Device Manager enumerates the keyboard, video, and mouse and loads the device drivers. All subsequent switching takes place in the normal keyboard-video-mouse switching time frame.

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



TP00389

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

— **NOTE**

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

2 Configuring your blade server

The BIOS Setup Utility program is provided with your blade server to perform system configuration, as well as to convey current settings and environment information. This utility is part of the basic input/output system (BIOS) code in your blade server and stores configuration settings in system non-volatile storage. Use it to change interrupt request (IRQ) settings, set the date and time, and set passwords, etc. Changes made to the BIOS Setup may not take effect until the system is rebooted.

Using the BIOS Setup Utility program

This section provides instructions to start the BIOS Setup Utility program and descriptions of the menu choices. The BIOS Setup Utility program uses the Unicode standard and is capable of displaying setup forms in EFIGS languages currently included in the Unicode standard.

Starting the BIOS Setup Utility program

Complete the following steps to start the BIOS Setup Utility:

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

Viewing BIOS Setup menus

General Keyboard Commands

See the following table for descriptions of each keyboard command.

Table 1. BIOS Setup Keyboard Commands

Key	Option	Description
Enter	Execute Command	The Enter key is used to activate sub-menus when the selected feature is a sub-menu, or to display a pick list if a selected option has a value field, or to select a sub-field for multi-valued features like time and date. If a pick list is displayed, the Enter key will undo the pick list and allow another selection in the parent menu.
ESC	Exit	<p>The ESC key provides a mechanism for backing out of any field. This key will undo the pressing of the Enter key. When the ESC key is pressed while editing any field or selecting features of a menu, the parent menu is re-entered.</p> <p>When the ESC key is pressed in any sub-menu, the parent menu is re-entered. When the ESC key is pressed in any major menu, the exit confirmation window is displayed and the user is asked whether changes can be discarded. If "No" is selected and the Enter key is pressed, or if the ESC key is pressed, you are returned to where you were before ESC was pressed without affecting any existing any settings. If "Yes" is selected and the Enter key is pressed, setup is exited and the BIOS continues with POST.</p>

Table 1. BIOS Setup Keyboard Commands

Key	Option	Description
↑	Select Item	The up arrow is used to select the previous value in a pick list, or the previous options in a menu item's option list. The selected item must then be activated by pressing the Enter key.
↓	Select Item	The down arrow is used to select the next value in a menu item's option list, or a value field's pick list. The selected item must then be activated by pressing the Enter key.
-	Change Value	The minus key on the keypad is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list. This key only works for date and time.
+	Change Value	The plus key on the keypad is used to change the value of the current menu item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code, but will have the same effect. This key only works for date and time.
F9	Setup Defaults	<p>Pressing F9 causes the following message to appear:</p> <p>Setup Configuration</p> <p>Load default configuration now?</p> <p>[Yes] [No]</p> <p>If "Yes" is selected and the Enter key is pressed, all Setup fields are set to their default values. If "No" is selected and the Enter key is pressed, or if the ESC key is pressed, you are returned to where you were before F9 was pressed without affecting any existing field values.</p>
F10	Save and Exit	<p>Pressing F10 causes the following message to appear:</p> <p>Setup Confirmation</p> <p>Save configuration changes and exit now?</p> <p>[Yes] [No]</p> <p>If "Yes" is selected and the Enter key is pressed, all changes are saved and Setup is exited. If "No" is selected and the Enter key is pressed, or the ESC key is pressed, you are returned to where you were before F10 was pressed without affecting any existing values.</p>

Main Selections

The first setup screen is the Menu selection screen. This screen displays the various major menu selections that are available.

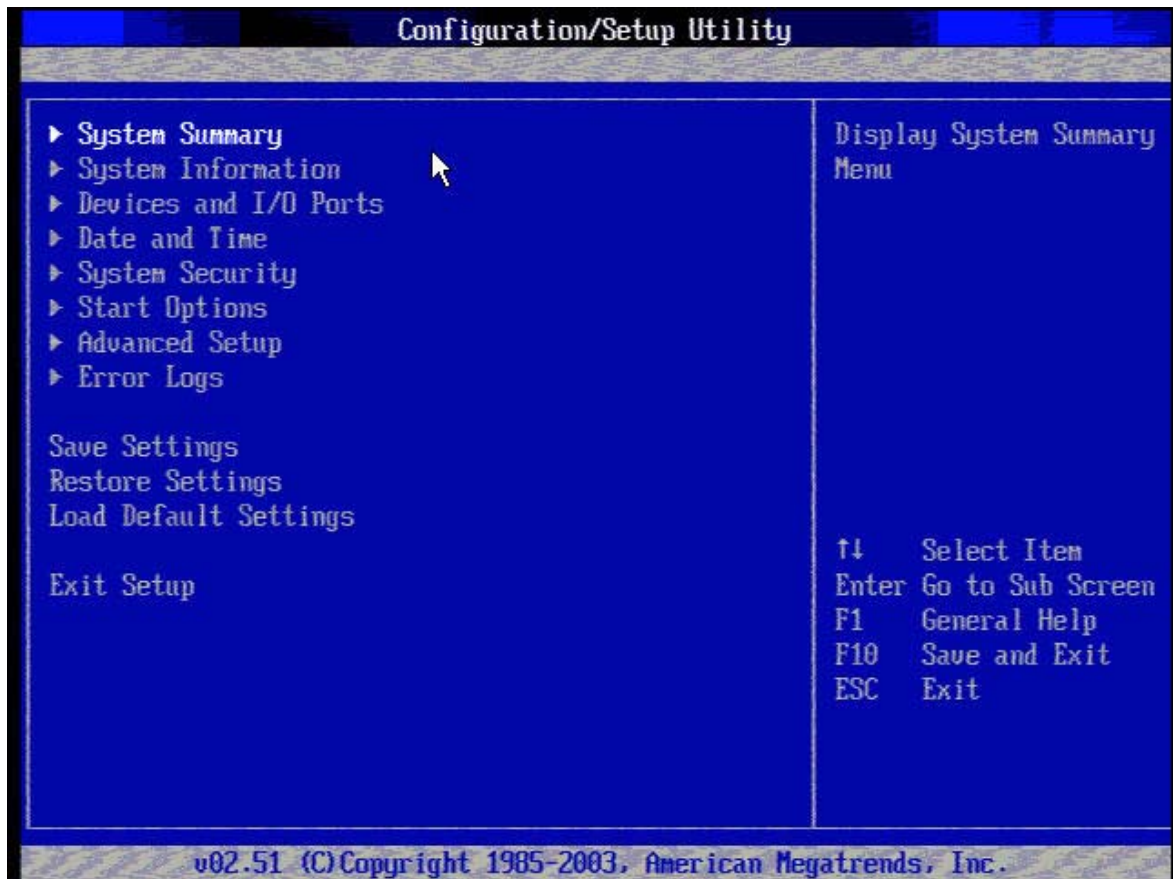


Table 2. Top-Level Menus of the BIOS Setup Utility

Menu	Description
System Summary	Displays System Summary information, including processor and memory installed in the system. This menu option also lets you select language preference.
System Information	Displays System Information, such as machine model, type, BIOS and firmware version, etc.
Devices and I/O ports	Displays information about the serial port, IDE configuration, NIC configuration, etc.
Date and Time	Allows you to change the date and time of the system.
System Security	Allows you to enter a user and supervisor password.
Start Options	Allows you to select boot options.
Advanced Setup	Allows you to control memory, CPU, and PCI-related advanced options.
Error Logs	Allows you to enable or disable error logging.

Table 2. Top-Level Menus of the BIOS Setup Utility

Menu	Description
Save Settings	Changed settings are saved.
Restore Settings	Changed settings are discarded.
Load Default Settings	Default BIOS settings are loaded.
Exit Setup	Exits the BIOS Setup Utility.

The following screenshots and tables illustrate/describe the functions that are available on each of the top-level menus.

System Summary Menu

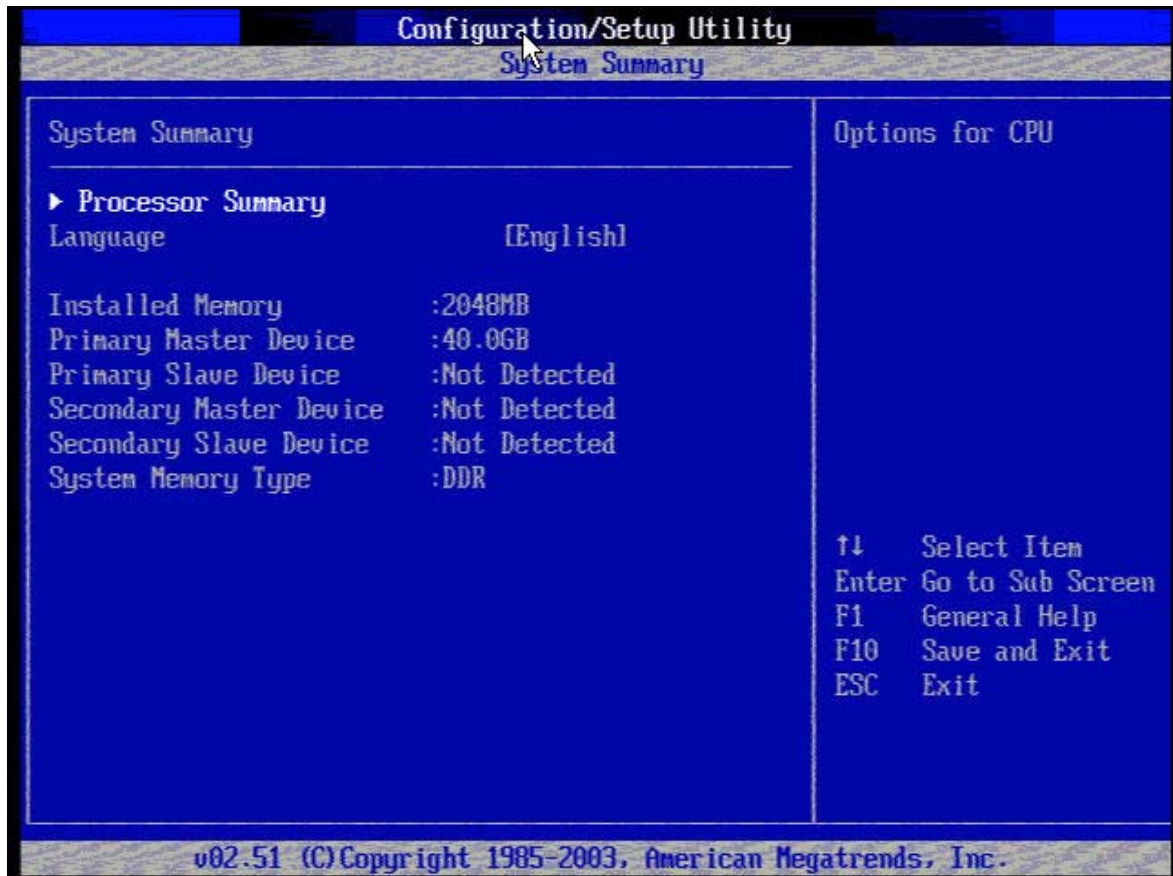


Table 3. System Summary Menu Options

Menu	Option	Description
Processor Summary	Submenu	Displays a detailed summary on CPU IDs, processor speed and cache size.
Language	English French Italian German Spanish	Use to select preferred language for setup.
Installed Memory	NA	Displays the total memory installed in the system.
Primary Master device	NA	Displays information on the primary master device.
Primary Slave device	NA	Displays information on the primary slave device.
Secondary Master device	NA	Displays information on the secondary master device.
Secondary Slave device	NA	Displays information on the secondary slave device.
System Memory Type	NA	Displays information about memory type (DDR).

Processor Summary Sub-menu

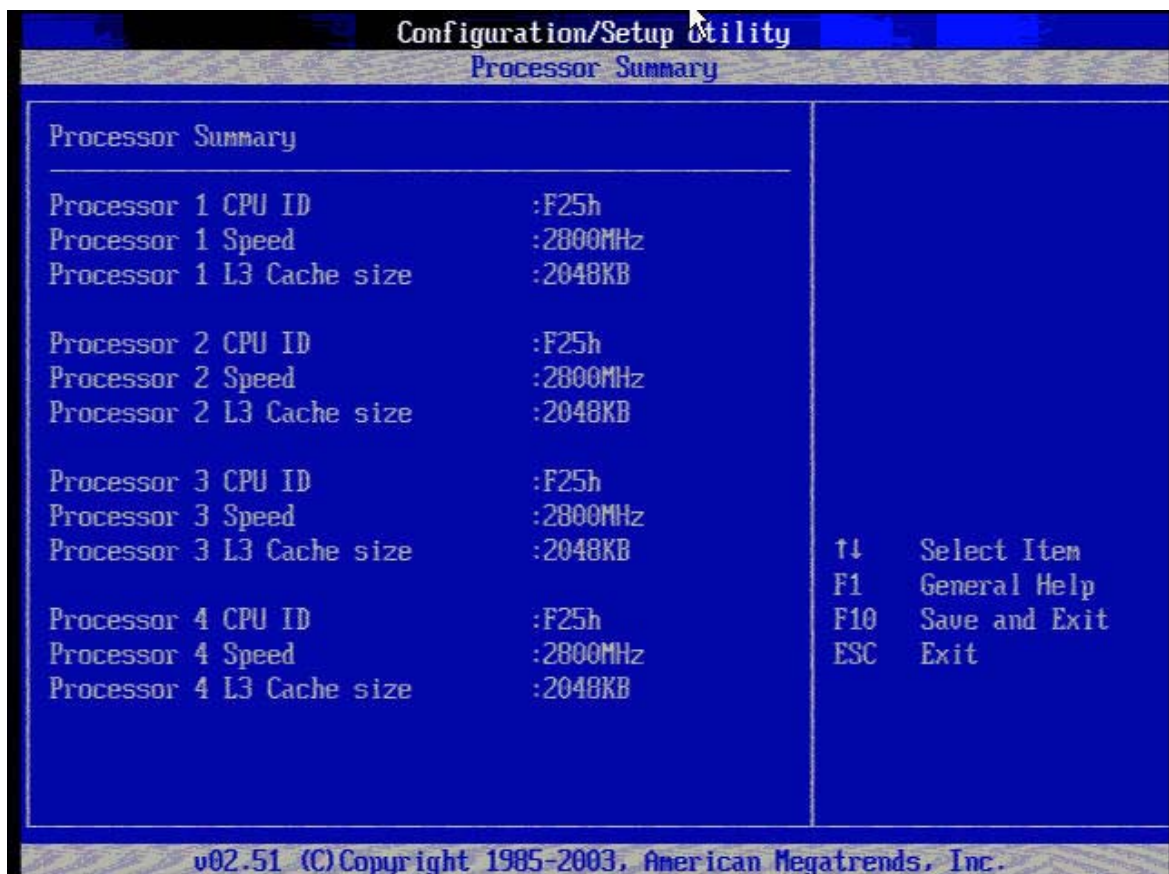


Table 4. Processor Summary Sub-Menu Options

Menu	Option	Description
Processor X CPUID	NA	Displays the CPU ID of Processor X.
Processor X Speed	NA	Displays the actual running speed of Processor X.
Processor X L2 Cache Size	NA	Displays the L2 cache size of Processor X.

— NOTE

X indicates Processor Number.

System Information Menu

The System Information Menu displays Intel or OEM specific information from VPD based on the OEM identification bit.

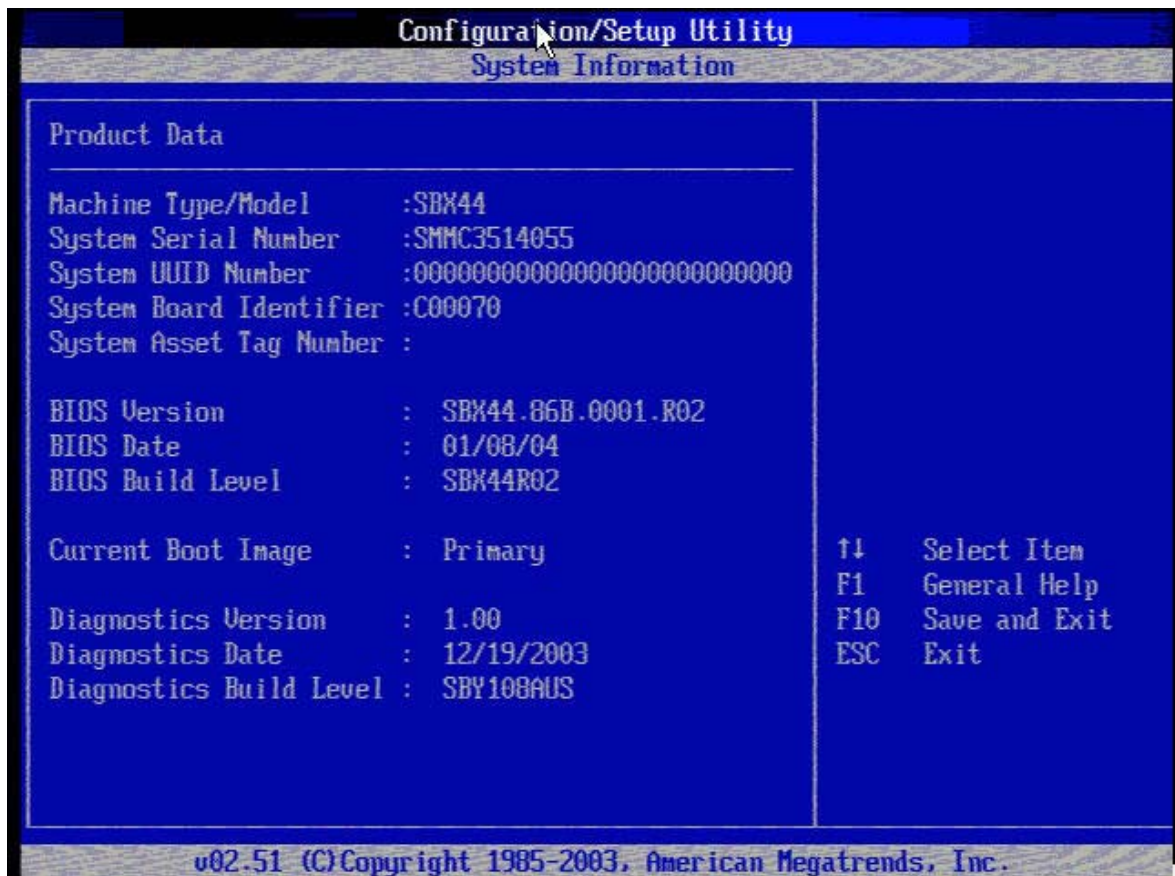


Table 5. System Information Menu Options

Menu	Option	Description
Machine Type/Model	NA	Displays information on the machine type and model.
System Serial Number	NA	Displays serial number of the system.
System UUID Number	NA	Displays the UUID number of the system.
System Board Identifier	NA	Displays the board number of the system.
System Asset Tag Number	NA	Displays the asset tag number of the system.
BIOS Version	NA	Displays the BIOS version of the system.
BIOS Date and Time	NA	Displays the BIOS date and time of the system.

Table 5. System Information Menu Options

Menu	Option	Description
BIOS Build Level	NA	Displays the BIOS build level of the system.
BMC (ISMP) ROM Build Level	NA	Displays the BMC firmware version of the system.
Diagnostics Version	NA	Displays the diagnostics version of the system.

Devices and I/O Ports Menu

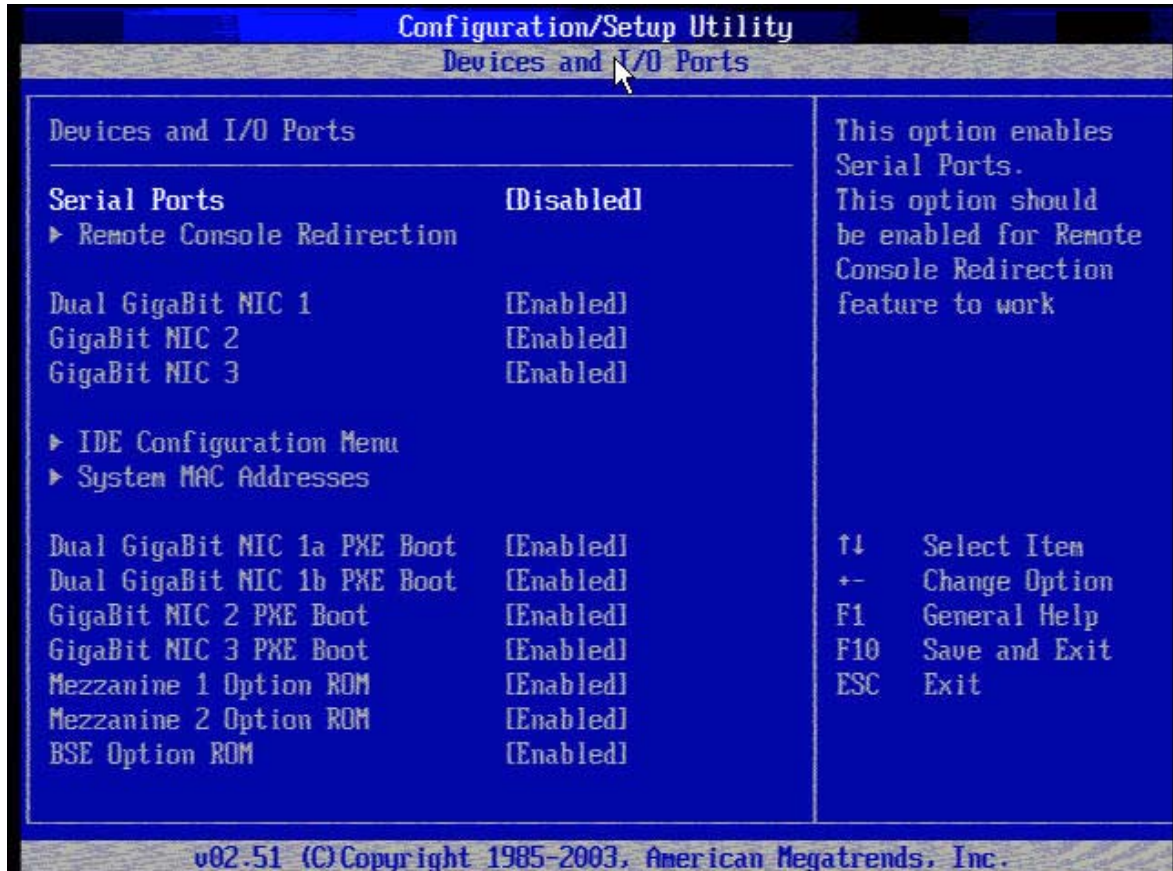


Table 6. Devices and I/O Ports Menu Options

Menu	Option	Description
Serial Port A	Disabled 3F8h 2F8h 3E8h 2E8h	Use to select the base I/O address for Serial Port A.
Remote Console Redirection	Sub-menu	Allows control of parameters for console redirection.
Ethernet 1	Enabled Disabled	Use to enable or disable Ethernet 1 (Anvik).
Ethernet 2	Enabled Disabled	Use to enable or disable Ethernet 2 (Attla 1).
Ethernet 3	Enabled Disabled	Use to enable or disable Ethernet 3 (Attla 2).
System MAC Addresses	Sub-menu	Displays the MAC addresses for all of the NICs.
IDE Configuration Menu	Sub-menu	Allows control of IDE selections.

Remote Console Redirection Sub-menu

Table 7. Remote Console Redirection Sub-menu Options

Menu	Option	Description
BIOS Redirection Port	Disabled Serial 1	Use to select BIOS Console Redirection port or to disable Console Redirection.
Baud Rate	9600 19.2 K 38.4 K 57.5 K 115.2 K	Use to select baud rate for Console Redirection.

Table 7. Remote Console Redirection Sub-menu Options

Menu	Option	Description
Flow Control	No Flow Control	CTS/RTS: hardware XON/XOFF: software
	CTS/RTS	CTS/RTS + CD: hardware + carrier detect for modem use
	XON/XOFF	
	CTS/RTS + CD	
Terminal Type	PC-ANSI	PC-ANSI: standard PC type terminal
	VT100+	VT100+: works only with English as the selected language
	VT-UTF8	VT-UTF8: Unicode

System MAC Addresses Sub-menu

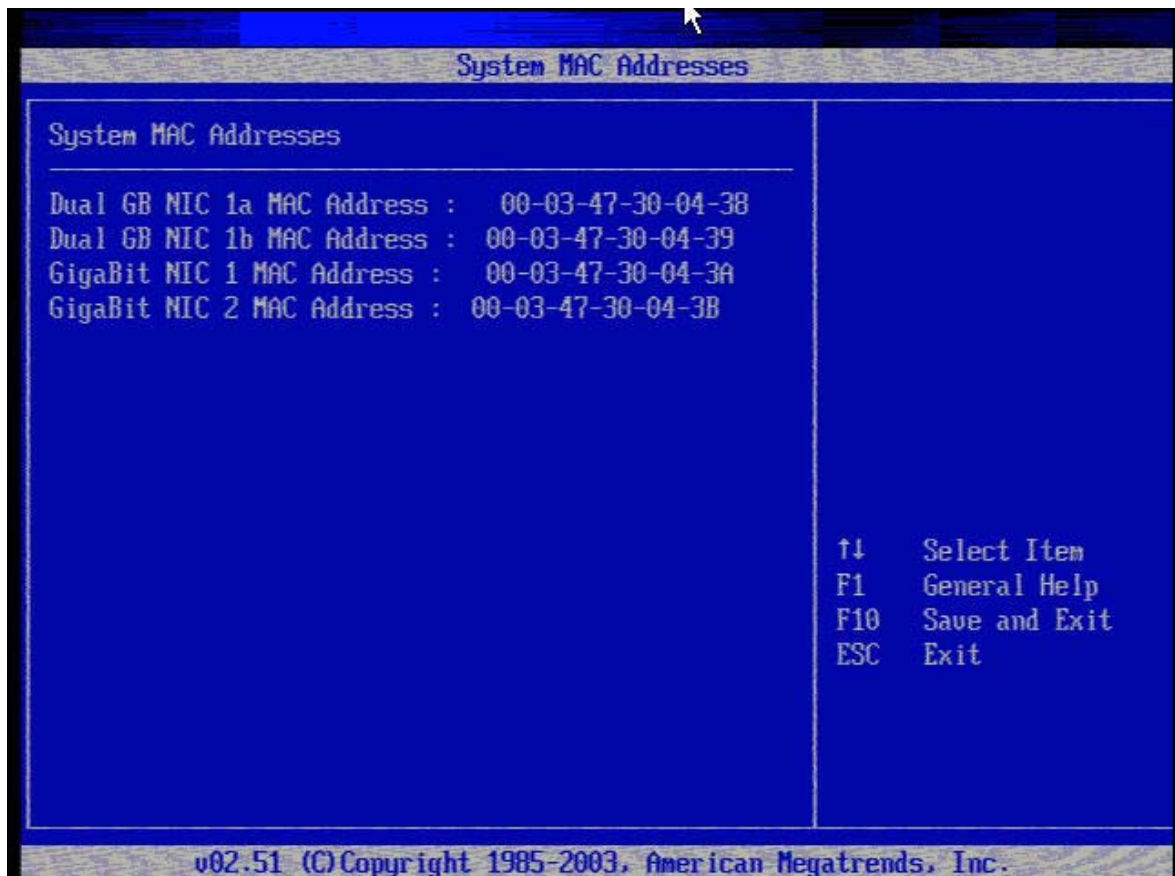


Table 8. System MAC Addresses Sub-menu Options

Menu	Option	Description
Anvik - 1 MAC Address	NA	Displays the Anvik Port 1 MAC Address.
Anvik - 2 MAC Address	NA	Displays the Anvik Port 2 MAC Address.
Attla - 1 MAC Address	NA	Displays the Attla 1 MAC Address.
Attla - 2 MAC Address	NA	Displays the Attla 2 MAC Address.

IDE Configuration Sub-menu

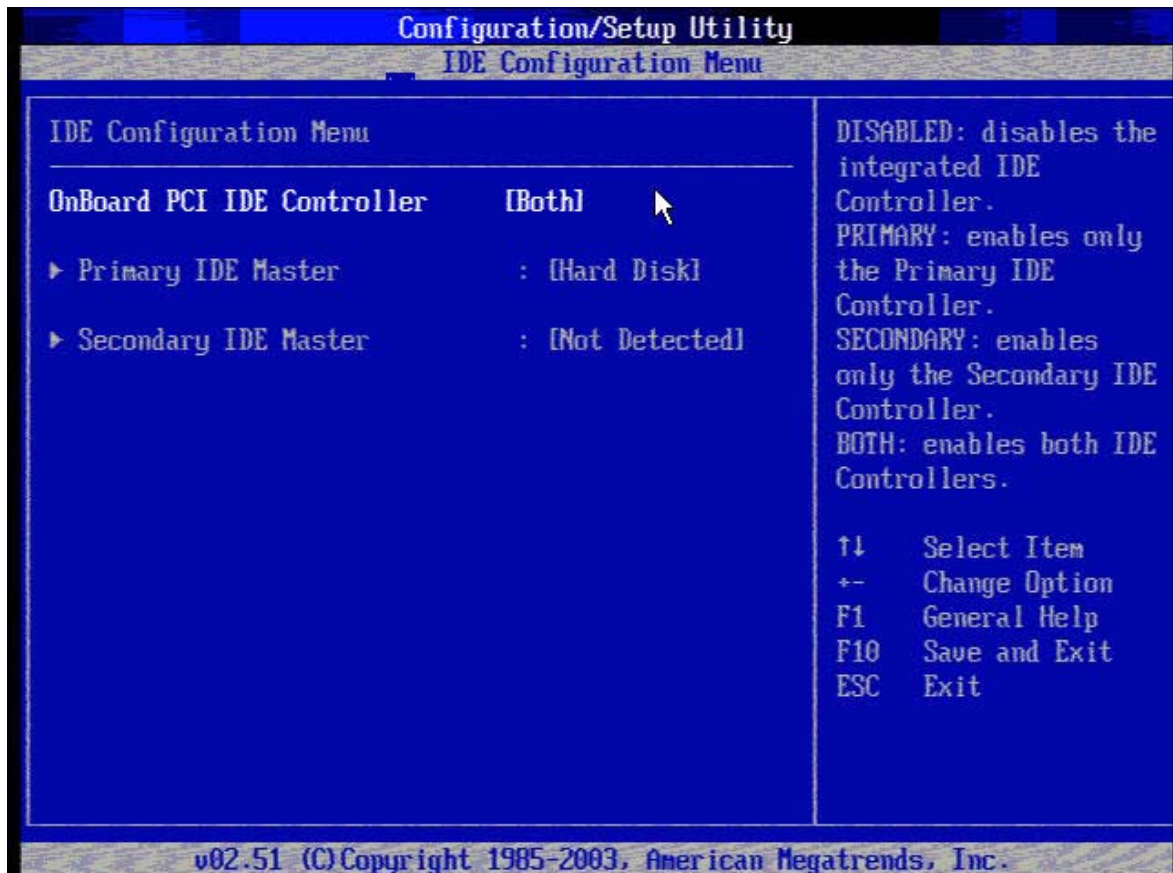


Table 9. IDE Configuration Sub-menu Options

Menu	Option	Description
Onboard PCI IDE Controller	Disabled Primary Secondary Both	Use to disable or enable primary only, secondary only, or both IDE controllers.
Primary IDE Master	Sub-menu	Use to control the parameters for the Primary IDE Master Controller.
Primary IDE Slave	Sub-menu	Use to control the parameters for the Primary IDE Slave Controller.
Secondary IDE Master	Sub-menu	Use to control the parameters for the Secondary IDE Master Controller.
Secondary IDE Slave	Sub-menu	Use to control the parameters for the Secondary IDE Slave Controller.

Primary/Secondary IDE Master/Slave Sub-menu

Table 10. Primary/Secondary IDE Master/Slave Sub-menu Options

Menu	Option	Description
Device	NA	Displays the detected device.
Type	Not Installed Auto CDROM ARMD	Use to select type of device that is connected.
LBA/Large Mode	Disabled Auto	Use to disable or enable LBA Mode if device supports it and device is not already formatted with LBA disabled.
Block (Multi-transfer Mode)	Disabled Auto	Disabled: data transfer occurs one sector at a time Auto: data transfer occurs multiple sectors at a time if device supports it
PIO Mode	Auto 0 1 2 3 4	Use to select PIO mode.

Table 10. Primary/Secondary IDE Master/Slave Sub-menu Options

Menu	Option	Description
DMA Mode	Auto	Use to select DMA mode.
	SWDMA0	Auto: auto detected
	SWDMA1	SWDMA _n : single word DMA _n
	SWDMA2	MWDMA _n : multi-word DMA _n
	MWDMA0	UDMA _n : ultra DMA _n
	MWDMA1	
	MWDMA2	
	UDMA0	
	UDMA1	
	UDMA2	
	UDMA3	
	UDMA4	
S.M.A.R.T.	Auto	Use to select Self-Monitoring, Analysis and Reporting Technology.
	Disabled	
	Enabled	
32Bit Data Transfer	Disabled	Use to disable or enable 32-bit data transfer.
	Enabled	

Date and Time Menu

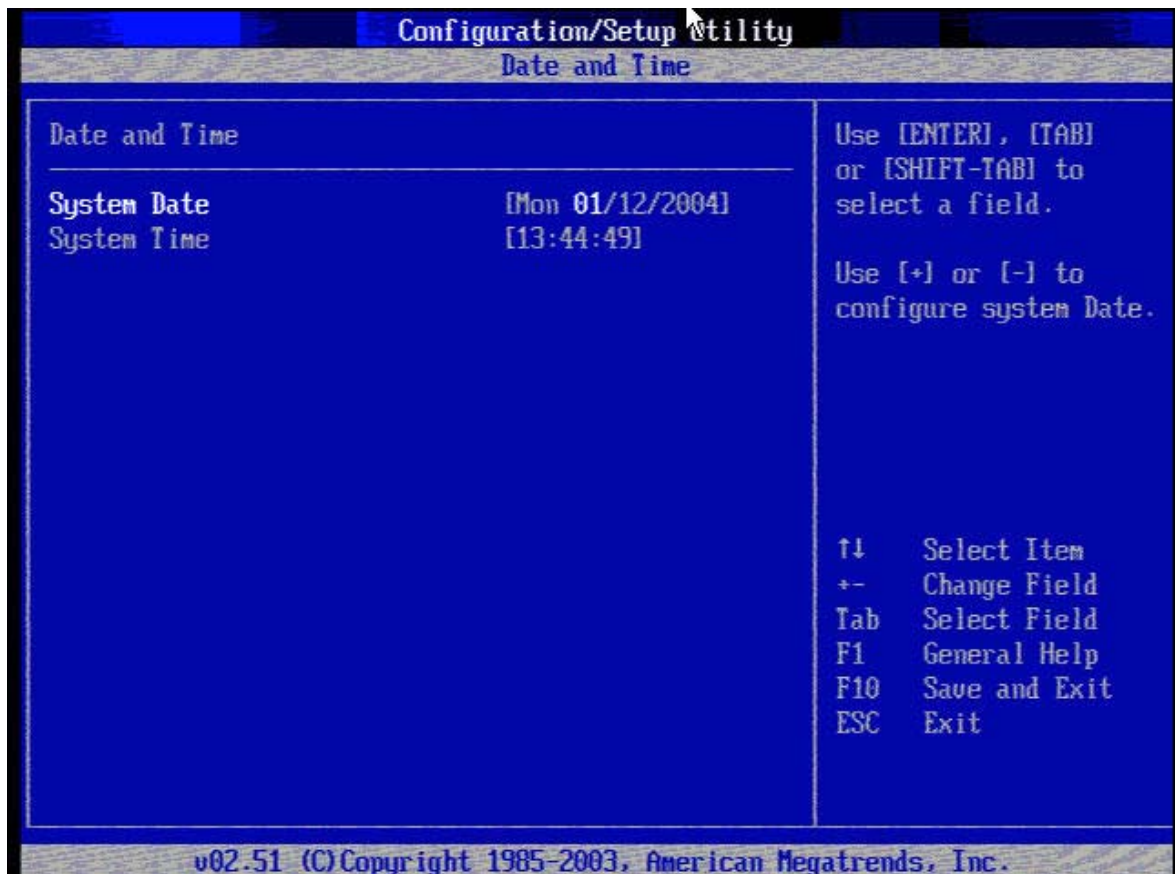


Table 11. Date and Time Menu Options

Menu	Option	Description
System Date	Day MM/DD/YYYY	Use to set system date.
System Time	HH:MM:SS	Use to set system time.

System Security Menu

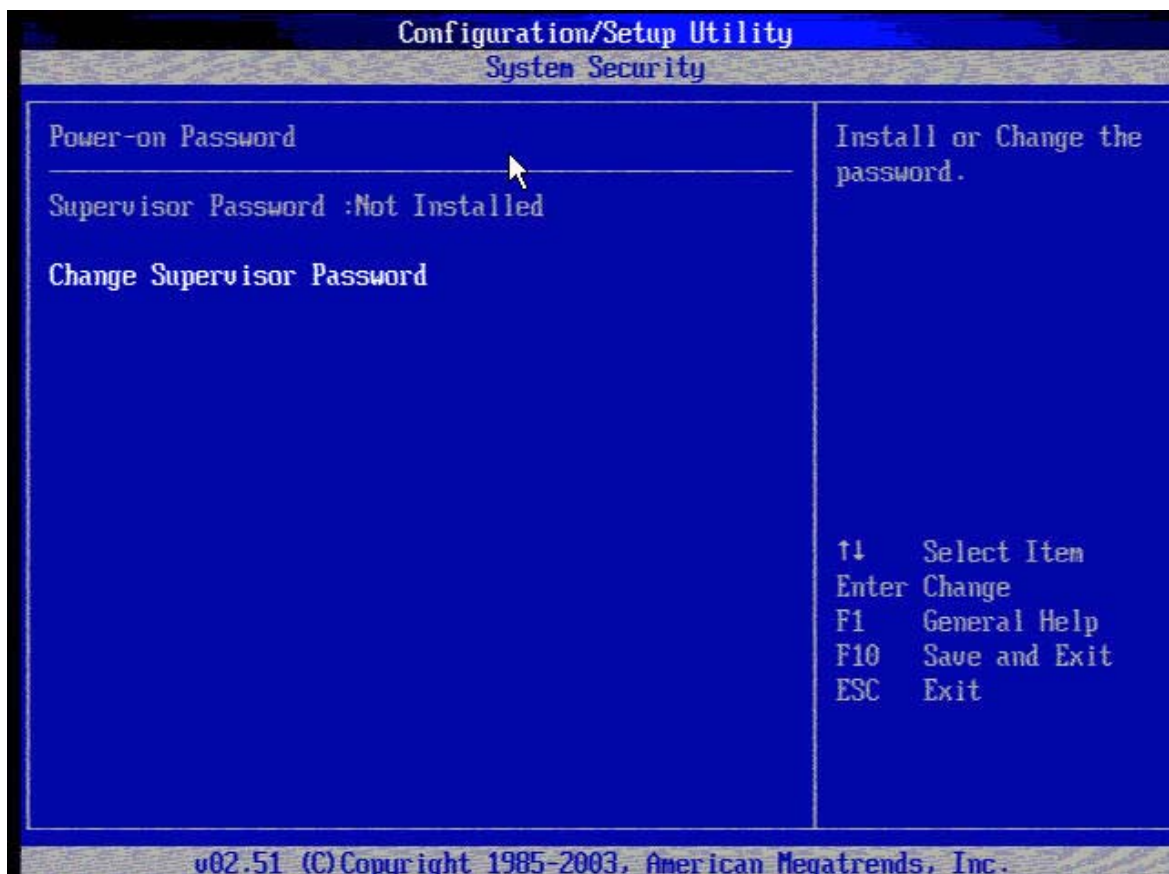


Table 12. System Security Menu Options

Menu	Option	Description
Supervisor Password	Not Installed Installed	Status information only; cannot be modified. Once set, can be disabled by setting to a null string or by clearing the password jumper on the I/O board.
User Password	Not Installed Installed	Status information only; cannot be modified. Once set, can be disabled by setting to a null string or by clearing the password jumper on the I/O board.
Change Supervisor Password	NA	When the Enter key is pressed, you are prompted for a password. Press the ESC key to abort. Once set, can be disabled by setting to a null string or by clearing the password jumper on the I/O board.
Change User Password	NA	When the Enter key is pressed, you are prompted for a password. Press the ESC key to abort. Once set, can be disabled by setting to a null string or by clearing the password jumper on the I/O board.
Clear User Password	NA	When the Enter key is pressed, the User password is cleared.

Start Options Menu

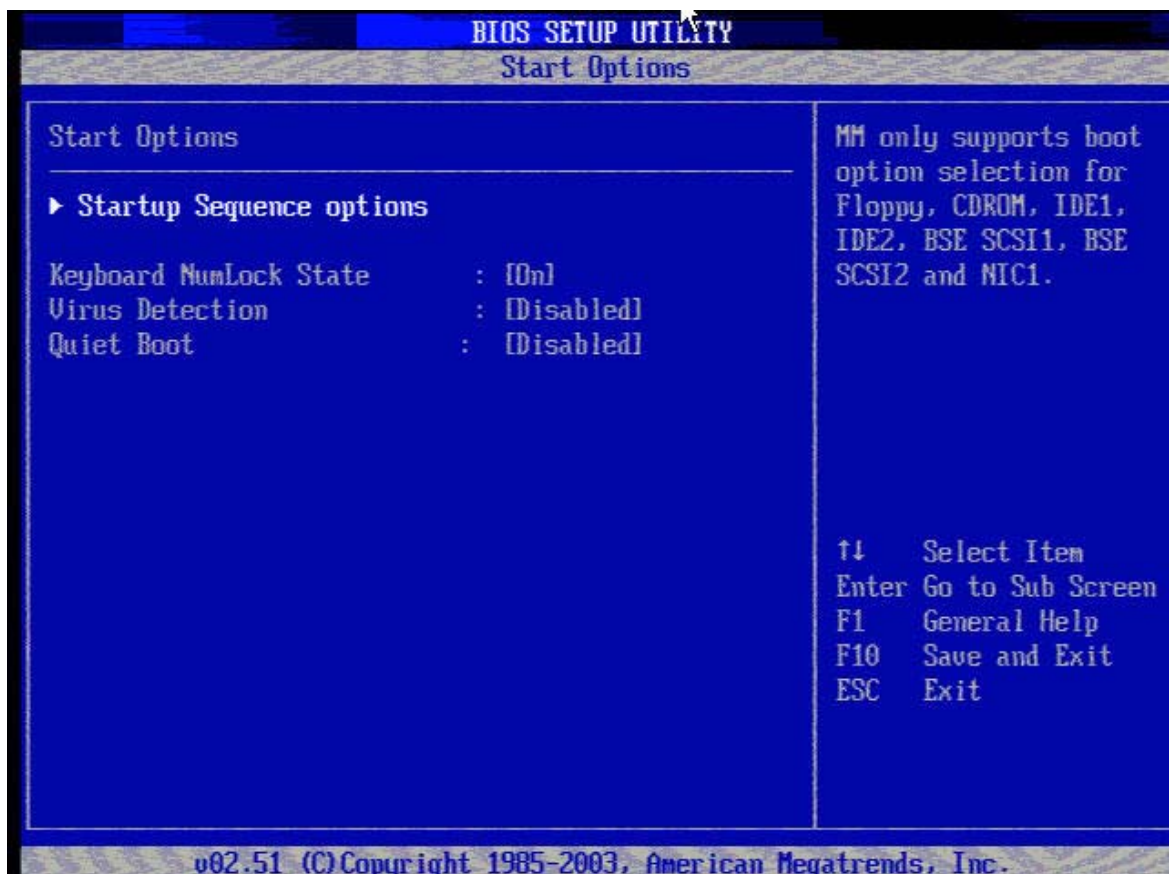


Table 13. Start Options Menu Options

Menu	Option	Description
Startup Sequence Options	Sub-menu	Allows selection of possible boot options.
Keyboard NumLock State	On Off	Allows you to turn on or off NumLock.
Virus Detection	Disabled Enabled	Allows you to enable or disable boot sector virus protection. The BIOS does not allow changing the boot sector if enabled.

Startup Sequence Options Sub-menu

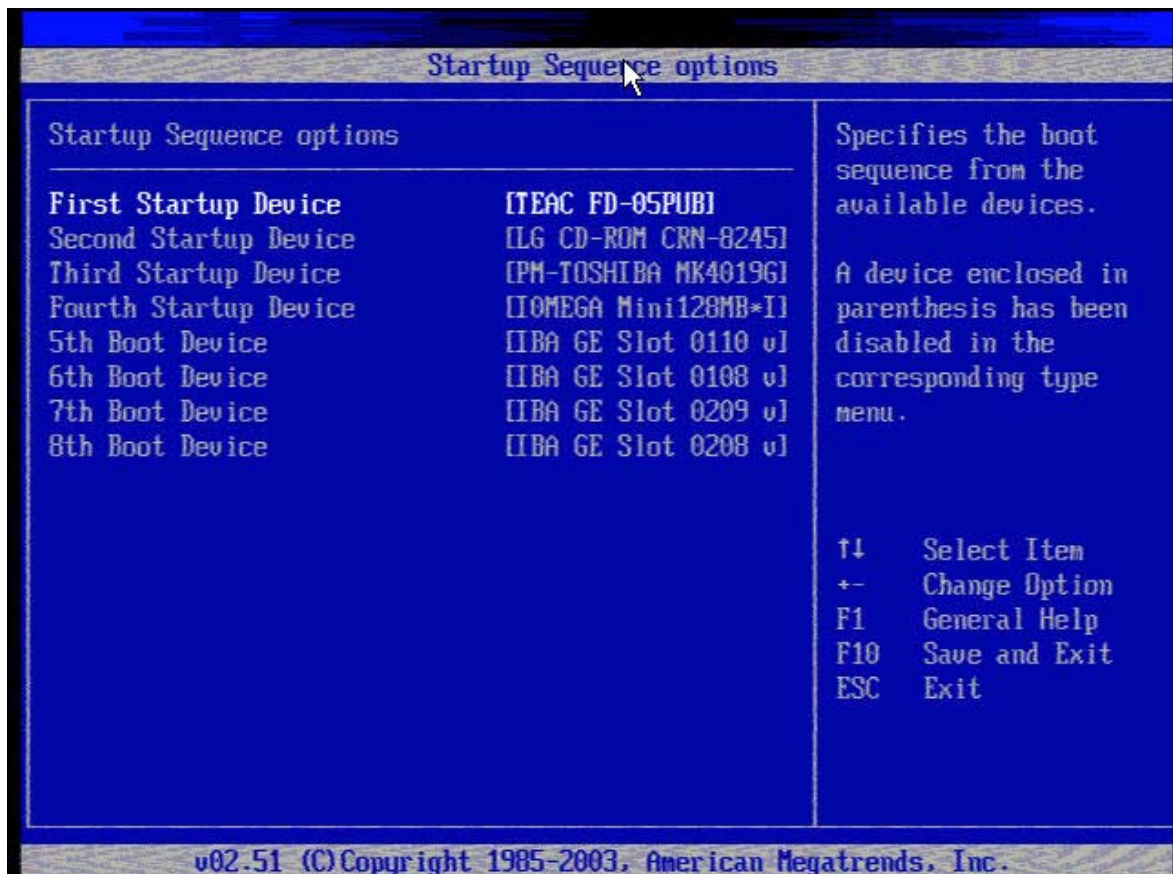


Table 14. Startup Sequence Options Sub-menu Options

Menu	Option	Description
First Startup Device	NA	Allows you to select the first device in the boot order.
Second Startup Device	NA	Allows you to select the second device in the boot order.
Third Startup Device	NA	Allows you to select the third device in the boot order.

— NOTE

The total number of choices depends on the number of bootable devices detected in the system.

Advanced Setup Menu

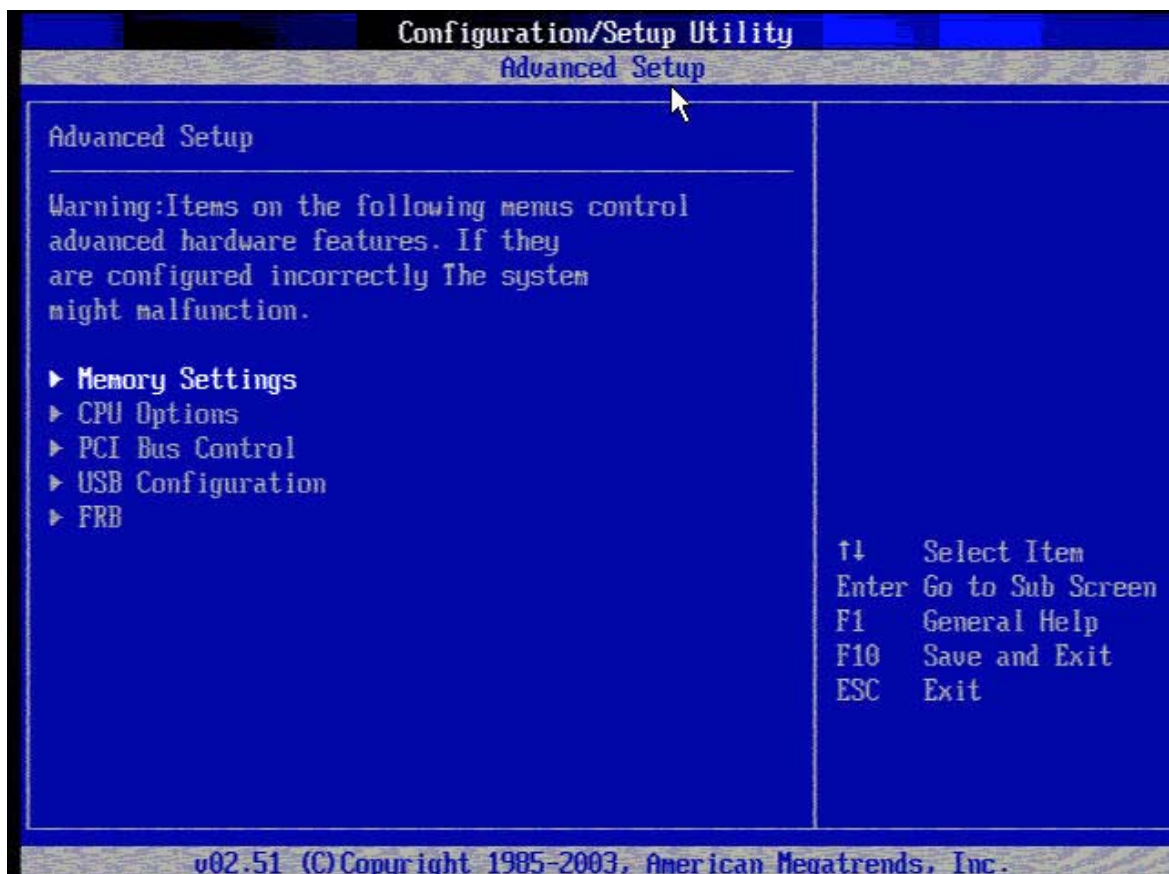


Table 15. Advanced Setup Menu Options

Menu	Option	Description
Memory Settings	Sub-menu	Displays memory row information and allows enabling of disabled row. Also allows control of memory timing parameters.
CPU Options	Sub-menu	Allows control of processor settings, such as hyper-threading and enabling/disabling of cache.
USB Configuration	Sub-menu	Allows control of USB-related settings.

Memory Settings Sub-menu

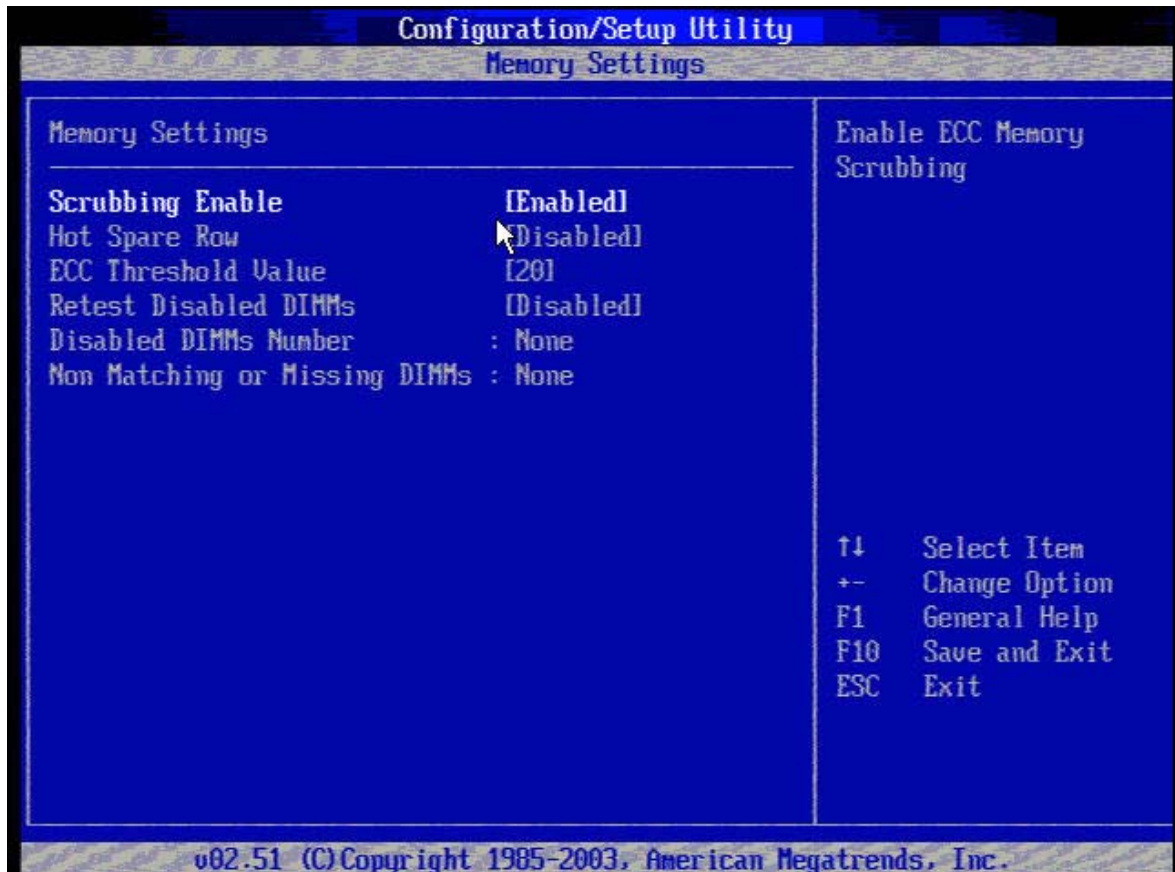


Table 16. Memory Settings Sub-menu Options

Menu	Option	Description
Memory Auto Precharge	Disabled	Use to enable or disable memory auto precharge.
	Enabled	
Write Combining	Disabled	Use to enable or disable memory write combining.
	Enabled	
Memory Write Posting	Enabled	Use to enable memory write posting.
	Disabled	
Scrubbing Enable	Enabled	Use to enable ECC memory scrubbing.
	Disabled	
Memory Timing Control	Auto	Use to select memory timing parameters. The next six options are available only if "Manual" is selected.
	Manual	

Table 16. Memory Settings Sub-menu Options

Menu	Option	Description
Act to Deact	6 Clks	Selects Act to Deact Clocks.
	5 Clks	
Act to Read/Write	00 Clks	Act to Read/Write delay
	2 Clks	
RAS Precharge Time	01 Clks	RAS Precharge time
	2 Clks	
RAS Cycle Time	9 Clks	RAS Cycle time
	8 Clks	
	7 Clks	
	6 Clks	
Min Row Act to Row Act	2 Clks	Use to select RAS to RAS delay.
	1 Clks	
Memory Auto Precharge	Disabled	Use to enable or disable memory auto precharge.
	Enabled	
Write Combining	Disabled	Use to enable or disable memory write combining.
	Enabled	
Memory Write Posting	Enabled	Use to enable or disable memory write posting.
	Disabled	
Scrubbing Enable	Enabled	Use to enable or disable EE memory scrubbing.
	Disabled	
Hot Spare Row	Disabled	Use to enable or disable hot spare memory feature. (All DIMMs in system should be identical for enabling this feature.)
	Enabled	
ECC Threshold Value	10	Use to select threshold value to start hot spare or system PFA.
	20	
	30	
	40	
Faulty DIMMs Map Out	Disabled	Use to enable or disable mapping out of faulty DIMMs due to single multi bit ECC.
	Enabled	

Table 16. Memory Settings Sub-menu Options

Menu	Option	Description
Disabled DIMM Set Number	NA	Displays the following information about which DIMMs are disabled: No DIMMS disabled DIMM1-5 disabled DIMM2-6 disabled DIMM3-7 disabled DIMM4-8 disabled DIMM MapOut disabled

CPU Options Sub-menu

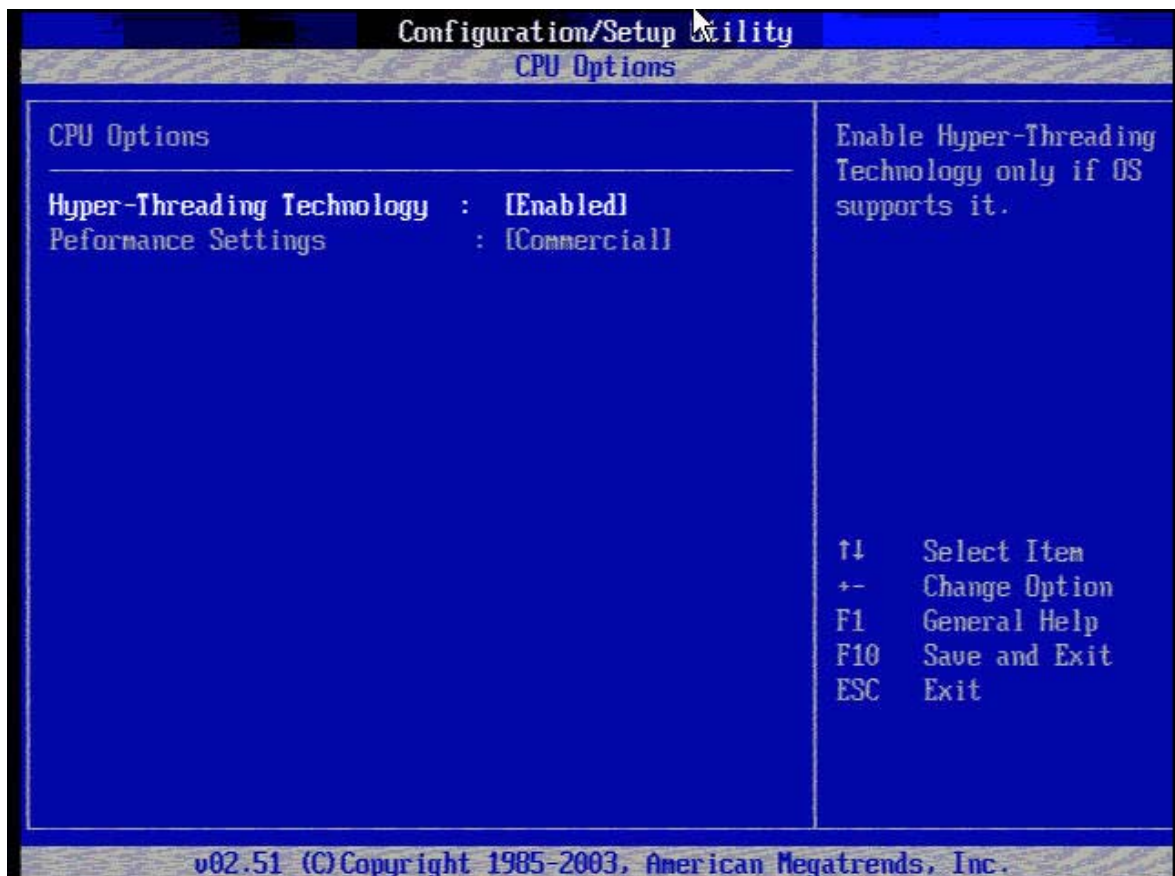


Table 17. CPU Options Sub-menu Options

Menu	Option	Description
Hyper-threading Technology	Enabled	Use to enable or disable hyper-threading technology.
	Disabled	

PCI Bus Control Sub-menu

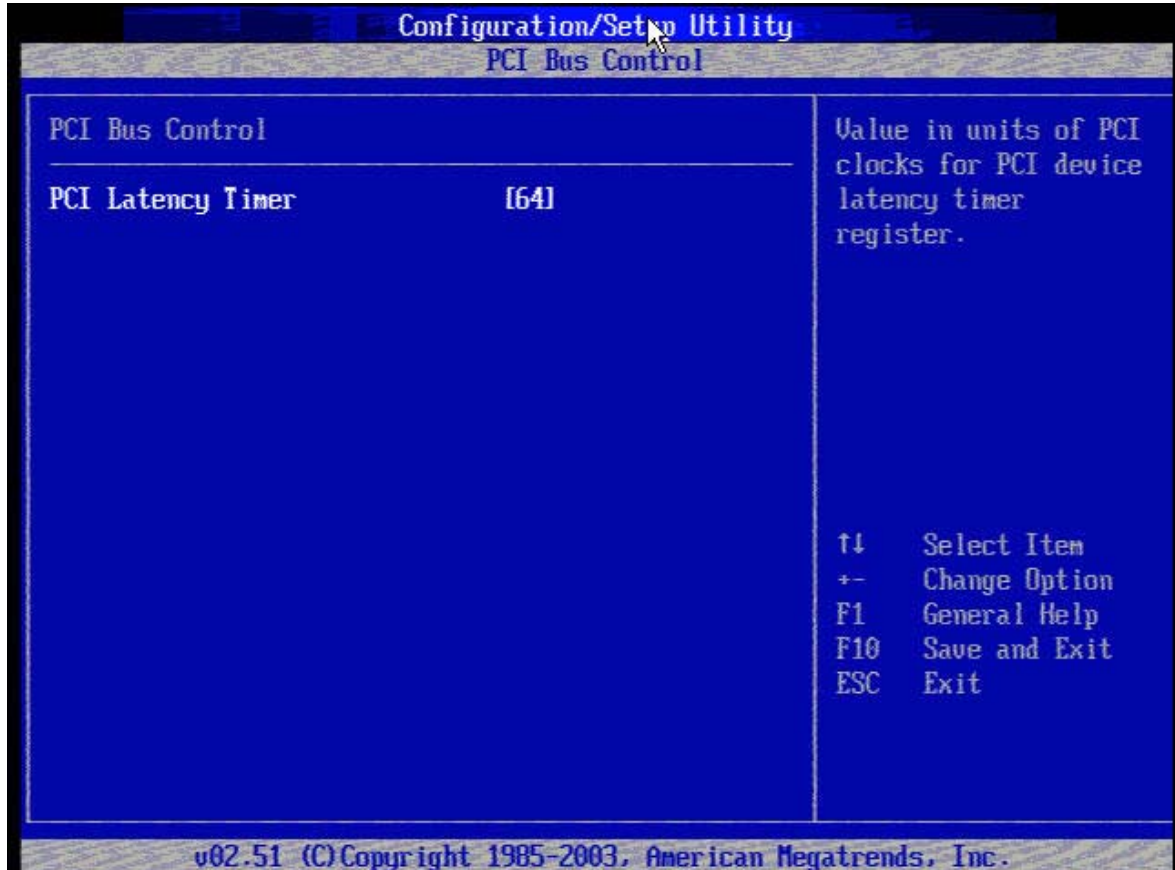


Table 18. PCI Bus Control Sub-menu Options

Menu	Option	Description
PCI Latency Timer	32	Use to select the PCI latency timing.
	64	
	96	
	128	
	160	
	192	
	224	
	248	

USB Configuration Sub-menu



Table 19. USB Configuration Sub-menu Options

Menu	Option	Description
Legacy USB Support	Enabled	Use to enable or disable legacy USB support.
	Disabled	
USB Mass Storage Device Configuration	Sub-menu	Allows configuration of the USB mass storage device.

USB Mass Storage Device Configuration Sub-menu

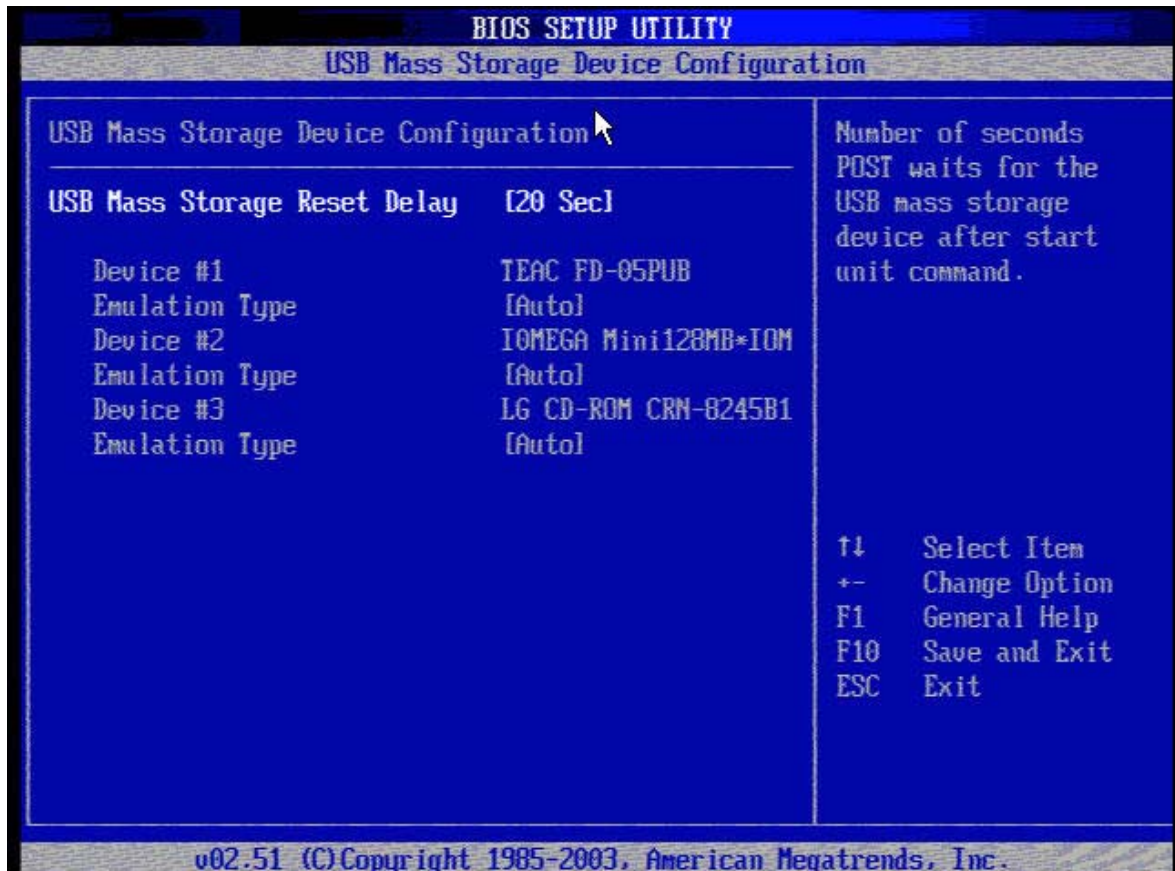


Table 20. USB Mass Storage Device Configuration Sub-menu Options

Menu	Option	Description
USB Mass Storage Reset Delay	10 Sec	Use to select the number of seconds that POST waits after the start unit command is sent to USB mass storage device.
	20 Sec	
	30 Sec	
	40 Sec	
Device #n	NA	Displays the number of the detected mass storage device.
Emulation Type	Auto	Use to select how the mass storage device will be configured. If "Auto" is selected, all devices with less than 530 MB are emulated as Floppy and remaining as Hard Disk.
	Floppy	
	Forced FDD	
	Hard Disk	
	CDROM	

FRB Configuration Sub-menu

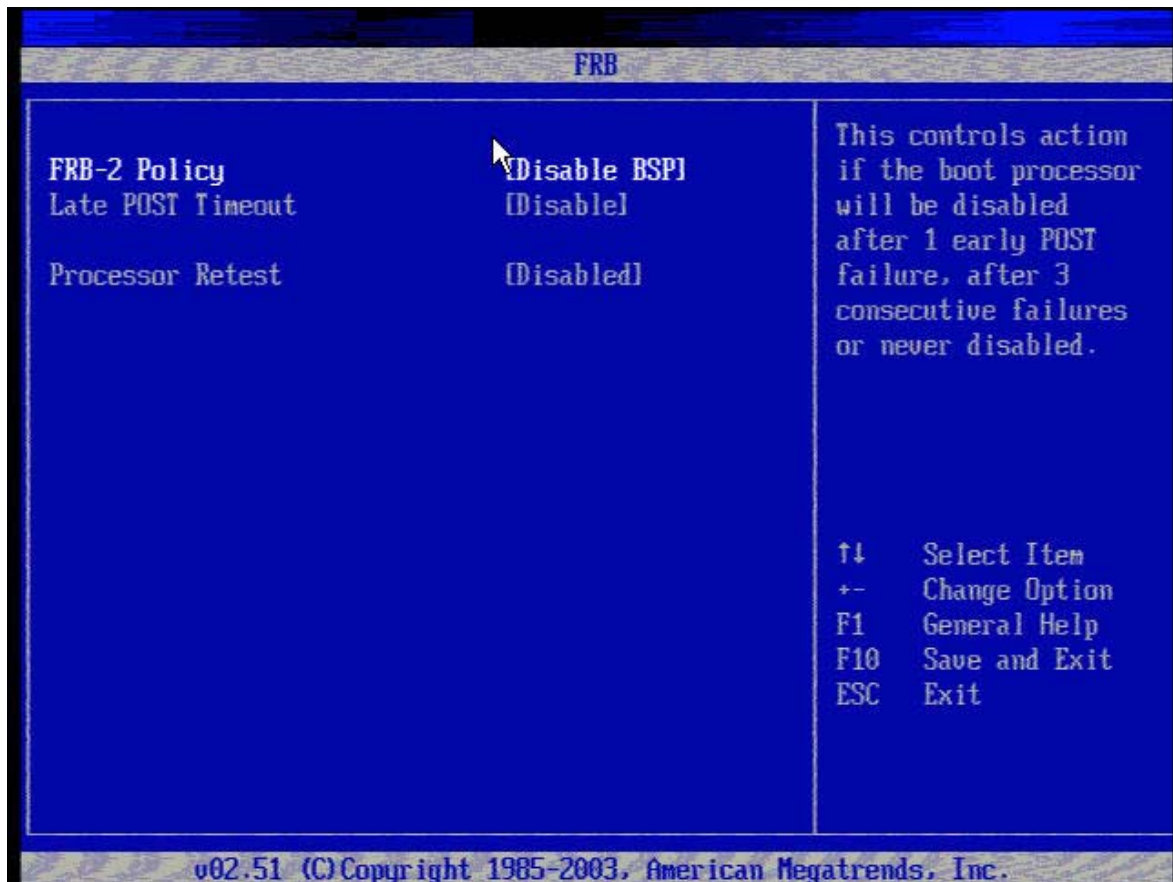


Table 21. FRB Configuration Sub-menu Options

Menu	Option	Description
FRB-2 Policy	Disable BSP Do Not Disable BSP Retry 3 Times Disable FRB-2 Timer	Use to control whether the boot processor will be disabled after 1 early POST failure, after 3 failures or never disabled.
Late POST Timeout	Disable 5 Minutes 10 Minutes 15 Minutes 20 Minutes	Use to control the time limit for add-in card detection.
Processor Retest	Disabled Enabled	If enabled, all processors are activated and retested during every reboot.

Error Logs Menu

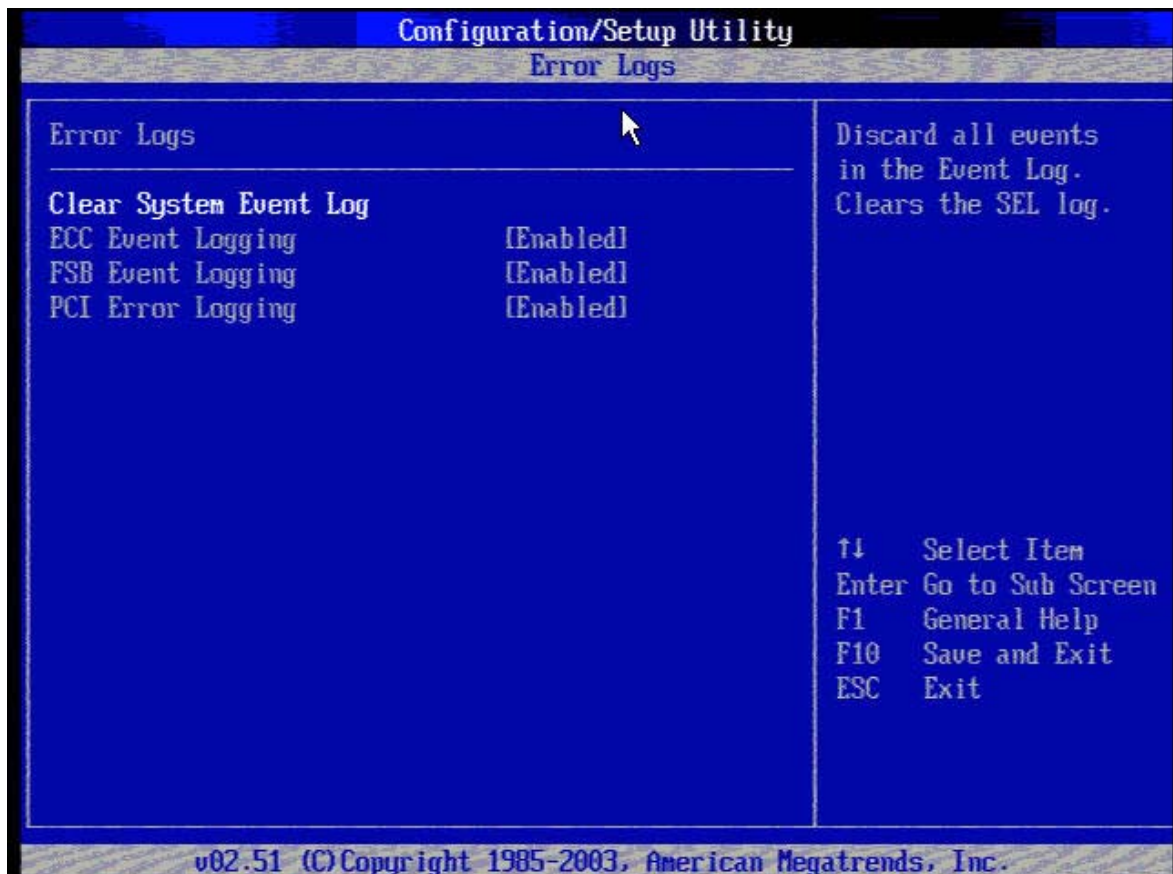


Table 22. Error Logs Menu Options

Menu	Option	Description
Clear Error Logs	Disabled	Use to clear error logs in the System Event Log (SEL).
	Enabled	
ECC Event Logging	Disabled	Use to enable or disable memory ECC error logging to the SEL.
	Enabled	
FSB Event Logging	Disabled	Use to enable or disable Front Side Bus (FSB) error logging to the SEL.
	Enabled	
PCI Event Logging	Disabled	Use to enable or disable PCI error logging to the SEL.
	Enabled	

Using the SCSI Setup Utility program

Starting the SCSI BIOS Configuration Utility

If you have SCSI BIOS Version 5.XX, and it includes the Fusion-MPT* SCSI BIOS Configuration Utility, you can change the default configuration of your SCSI host adapters. You may decide to alter these default values if there is a conflict between device settings or if you need to optimize system performance.

The version number of the SCSI BIOS is displayed in a banner on your computer monitor during boot. If the utility is available, the following message also appears on your monitor:

```
Press Ctrl-C to start Symbios Configuration Utility ...
```

This message remains on your screen for about five seconds, giving you time to start the utility. If you decide to press Ctrl-C, the message changes to:

```
Please wait, invoking Symbios Configuration Utility ...
```

After a brief pause, your monitor will display the Main Menu of the Fusion-MPT PCI SCSI BIOS Configuration Utility.

The following messages may appear during the boot process:

1. Adapter removed from boot order, parameters will be updated accordingly - Appears when an adapter is removed from the system or is relocated behind a PCI bridge.
2. Configuration data invalid, saving default configuration - Appears if none of the information in the NVRAM is valid.
3. Found SCSI Controller not in following Boot Order List, to Add: Press Ctrl-C to start Symbios Configuration Utility ... - Appears when less than four adapters are in the boot order and more adapters exist than are shown.

⇒ Important

- ⇒ The SCSI BIOS Configuration Utility is a powerful tool. If, while using it, you somehow disable all of the controllers, pressing `Ctrl-A` (or `Ctrl-E` on Version 5.00 or later) after memory initialization during reboot allows you to re-enable and reconfigure the controllers.

⇒ NOTE

Not all devices detected by the SCSI BIOS Configuration Utility can be controlled by the BIOS. Devices, such as tape drives and scanners, require that a device driver specific to that peripheral be loaded. The SCSI BIOS Configuration Utility does allow parameters to be modified for these devices.

Using the Configuration Utility

All SCSI BIOS Configuration Utility screens are partitioned into four fixed areas:

- Header Area: This area provides static information text, which is typically the product title and version.
- Main Area: This is the main area for presenting data. This area has a cursor for item selection, horizontal scrolling, and vertical scrolling. The horizontal and vertical scroll bars appear in this region.
- Menu Area: This area displays the current Main Area menus, if any. This area has a cursor for menu item selection.
- Footer Area: This area provides general help information text.

User Input

Throughout the graphical user interface (GUI), selections that are not permissible are grayed out.

Table 23. SCSI BIOS Configuration Utility user input features

Key	Description
F1	Help - Context sensitive help for the cursor resident field.
F2	Menu - Sets cursor context to the menu selection area. Select a menu item and press <Enter>.
Arrow keys	Use the up, down, left, right arrow keys to position the cursor and select an item.
Home/End	Use to position the cursor and select an item.
+/-	Change [Item] - Items with values in [] are modifiable. Use the numeric keypad "+" and numeric keypad "-" to update a modifiable field to its next relative value.
Esc	Abort/Exit - Aborts the current context operation or exits the current screen. User confirmation is solicited as required.
Enter	Execute <Item> - Items with values in < > brackets are executable. Press Enter to execute the field's associated function.

Main Menu

The Main Menu appears when you invoke the Fusion-MPT SCSI BIOS Configuration Utility. This screen displays a scrolling list of up to 256 LSI* Logic PCI to SCSI host adapters in the system and information about each of them.

Use the arrow keys to select an adapter then press <Enter> to view and modify the selected adapter's properties (and to gain access to the attached devices). Only adapters with LSI Logic Control enabled can be accessed. After selecting an adapter and pressing <Enter>, the adapter's SCSI bus is scanned and the Adapter Properties screen appears.

Two selections are available from the Main Menu:

- Boot Adapter List: allows selection and ordering of boot adapters. (See "Boot Adapter List" on page 39 for additional information.)
- Global Properties: allows changes to global scope settings. (See "Global Properties" on page 40 for additional information.)

To execute an item, select it and press <Enter>.

Table 24. SCSI BIOS Configuration Utility Main Menu field descriptions

Field	Description
Adapter	Indicates the specific family of LSI* Logic Host Adapters.
PCI Bus	Indicates the PCI Bus number (range 0x00 - 0xFF, 0 - 255 decimal) assigned by the system BIOS to an adapter.
Dev/Func	Indicates the PCI Device/Function assigned by the system BIOS to an adapter. An 8-bit value is mapped as follows: Bit # 7 6 5 4 3 2 1 0 _____ _____ > Bits 2 - 0: Function (range 0 - 7) > Bits 7 - 3: Device (range 0x00 - 0x1F, 0 - 31 decimal)
Port Number	Indicates the I/O Port Number that communicates with an adapter. The system BIOS assigns this number.
IRQ	Indicates the Interrupt Request Line used by an adapter. The system BIOS assigns this value.
NVM	Indicates whether an adapter has non-volatile memory (NVM) associated with it. An adapter's configuration is stored in its associated NVM.
Boot Order	Indicates the relative boot order (0 to 3) of an adapter. The Fusion*-MPT SCSI BIOS traverses up to four adapters in the specified order in search of bootable media. Access the "Boot Adapter List" menu to modify this item.
LSI Logic Control	Indicates whether an adapter is eligible for LSI* Logic software control or is reserved for control by non-LSI Logic software.
Global Properties	Indicates global properties that are not associated with a specific adapter or device.

Boot Adapter List

The adapter boot order specifies the order in which adapters will boot when more than one OS adapter is in a system.

Up to four of the total adapters in a system may be selected as bootable.

To add an adapter to the boot list, press "Insert" while on the Boot Adapter List. This puts the cursor on the adapter select list. Use the arrow keys to select the desired adapter and press <Enter> to add it to the end of the Boot Adapter List.

To remove an adapter from the Boot Adapter List, press "Delete" while on the desired adapter in the Boot Adapter List.

Table 25. SCSI BIOS Configuration Utility Boot Adapter List field descriptions

Field	Description
Adapter	Indicates the specific family of LSI* Logic Host Bus Adapters.
PCI Bus	Indicates the PCI Bus number (range 0x00 - 0xFF, 0 - 255 decimal) assigned by the system BIOS to an adapter.
Dev/Func	Indicates the PCI Device/Function assigned by the system BIOS to an adapter. An 8-bit value is mapped as follows: Bit # 7 6 5 4 3 2 1 0 _____ _____ > Bits 2 - 0: Function (range 0 - 7) > Bits 7 - 3: Device (range 0x00 - 0x1F, 0 - 31 decimal)
Boot Order	Specifies the relative boot order (0 to 3) of an adapter. - : decreases an adapter's relative boot order + : increases an adapter's relative boot order
Current Status	Indicates whether an adapter in the boot list was enabled during the most recent boot. Disabled adapters and their attached devices are ignored by the Fusion*-MPT SCSI BIOS although they are still visible to the SCSI BIOS Configuration Utility.
Next Boot	Specifies whether to enable an adapter upon the next boot. The Fusion-MPT SCSI BIOS ignores disabled adapters and their attached devices although they are still visible to the SCSI BIOS Configuration Utility.

Global Properties

The Global Properties option on the Main Menu allows you to set Display and Video modes as well as pause if an alert message has been displayed.

Table 26. SCSI BIOS Configuration Utility Global Properties field descriptions

Field	Description
Pause When Boot Alert Displayed	Specifies whether to pause for user acknowledgement after displaying an alert message during boot. The Boot Alert setting can be set to either "No" or "Yes". To continue after displaying a message, specify "No". To wait for any key after displaying a message, specify "Yes".
Boot Information Display Mode	Specifies the information display mode of the BIOS during boot. It controls how much information about adapters and devices is displayed during boot. The Display Mode setting can be set to either "Terse" or "Verbose". To display minimal information, specify "Terse" mode. To display detailed information, specify "Verbose" mode.
Negotiate with Devices	Sets the default value for synchronous and wide negotiations with specified devices. Options are: All, None, or Supported.
Video Mode	Specifies the default video mode for the SCSI BIOS Configuration Utility. The Video Mode setting can be set to either "Color" or "Monochrome". The monochrome setting enhances readability on a monochrome monitor.
Support Interrupt	Allows the ability to prevent a hook on INT40, if required.
<Restore Defaults>	Press <Enter> to obtain default settings.

Adapter Properties

The Adapter Properties Menu allows you to view and modify adapter settings. It also provides access to an adapter's device settings.

Table 27. SCSI BIOS Configuration Utility Adapter Properties field descriptions

Field	Description
<Device Properties>	Press <Enter> to view and modify device properties.
SCSI Parity	Indicates whether SCSI parity is enabled for an adapter. When disabled, it is also necessary to disable disconnects for all devices, as parity checking for the reselection phase is NOT disabled. If a non-parity generating device disconnects, its operation will never complete because the reselection fails due to parity error.
Host SCSI ID	Indicates the SCSI identifier of an adapter [0 - 7] or [0 - 15]. It is recommended that this field be set to the highest priority SCSI identifier, which is 7. – NOTE Eight-bit SCSI devices cannot see identifiers greater than 7.

Table 27. SCSI BIOS Configuration Utility Adapter Properties field descriptions


Field	Description
SCSI Bus Scan Order	<p>Indicates the order in which to scan SCSI identifiers on an adapter. Changing this item will affect drive letter assignment(s) if more than one device is attached to an adapter.</p> <p>– NOTE Changing this item may conflict with an OS that automatically assigns drive order.</p>
Removable Media Support	<p>Specifies the removable media support option for an adapter. Three settings are allowed:</p> <ul style="list-style-type: none"> • None - Indicates no removable media support if the drive is selected as first (BBS) or is first in the scan order (non-BBS). • Boot Drive Only - Provides removable media support for a removable hard drive if it is first in the scan order. • With Media Installed - Provides removable media regardless of the drive ordering.
CHS Mapping	<p>Defines how the Cylinder Head Sector values are mapped onto a disk without pre-existing partition information. CHS Mapping allows two settings:</p> <ul style="list-style-type: none"> • SCSI Plug and Play Mapping (default value) - Automatically determines the most efficient and compatible mapping. • Alternate CHS Mapping - Utilizes an alternate, possibly less efficient mapping that may be required if a device is moved between adapters from different vendors. <p>– NOTE Neither of these options has any effect after a disk has been partitioned using the FDISK command. To change the CHS Mapping on a partitioned disk, use the FDISK command to delete all partitions. Then reboot the system to clear memory or the old partitioning data will be reused, thus nullifying the previous operation.</p> <p> CAUTION: Use care to ensure that the correct disk is the target of an FDISK command.</p>
Spinup Delay (Secs)	<p>Indicates the number of seconds to wait between spinups of devices attached to an adapter. Staggered spinups will balance the total electrical current load on the system during boot. The default value is two seconds with choices between 1 and 10 seconds.</p>
Secondary Cluster Server	<p>Indicates whether an adapter has one or more devices attached that are shared with one or more other adapters and, therefore, the Fusion*-MPT PCI SCSI BIOS should avoid SCSI Bus resets as much as possible.</p> <p>This option allows you to enable an adapter to join a cluster of adapters without doing any SCSI bus resets. This is a requirement for the Microsoft* Cluster Server. The default value is "No" with an alternate option of "Yes".</p>

Table 27. SCSI BIOS Configuration Utility Adapter Properties field descriptions

Field	Description
Termination Control	<p>Indicates whether an adapter has automatic termination control, and if so, indicates its current status. Two settings are possible:</p> <ul style="list-style-type: none"> • Auto - The adapter automatically determines whether it should enable or disable its termination. • Off - Termination at the adapter is off; the devices at the ends of the SCSI bus must terminate the bus. <p>– NOTE If Auto is grayed out then termination is automatic and not programmable.</p>
<Restore Defaults>	Press <Enter> to obtain default settings.

Device Properties

The Device Properties screen provides viewing and updating of individual device settings for an adapter.

Changing a setting for the host device (for example, SCSI ID 7) changes the setting for all the devices.

Table 28. SCSI BIOS Configuration Utility Device Properties field descriptions

Field	Descriptions
SCSI ID	Indicates the device's SCSI Identifier.
Device Identifier	Indicates the ASCII device identifier string extracted from the device's Inquiry Data.
Sync Rate	Indicates the maximum synchronous data transfer rate in Mega Transfers per second.
Data Width	Indicates the maximum data width in bits.
Scan ID	<p>Indicates whether to scan for this SCSI identifier at boot time. This item can be used to ignore a device and to decrease boot time by disabling the inquiry of unused SCSI identifiers.</p> <p>Set this option to "No" if there is a device that you do not want to be available to the system. Also, on a bus with only a few devices attached, the user can speed up boot time by changing this setting to "No" for all unused SCSI IDs.</p>
Scan LUNs > 0	<p>Indicates whether to scan for LUNs greater than zero for a device. LUN zero is always queried. This option should be used if a multi-LUN device responds to unoccupied LUNs or if it is desired to reduce the visibility of a multi-LUN device to LUN zero only.</p> <p>Set to option to "No" if you have problems with a device that responds to all LUNs whether they are occupied or not. Also, if a SCSI device with multiple LUNs exists on your system, but you do not want all of those LUNs to be available to the system, then set this option to "No." This will limit the scan to LUN 0 only.</p>
Disconnect	Indicates whether to allow a device to disconnect during SCSI operations. Some (mostly newer) devices run faster with disconnect enabled, while some (mostly older) devices run faster with disconnect disabled.

Table 28. SCSI BIOS Configuration Utility Device Properties field descriptions

Field	Descriptions
SCSI Timeout	<p>Indicates the maximum amount of time [0 to 9999] in seconds to wait for a SCSI operation to complete.</p> <p>Since time-outs provide a safeguard that allows the system to recover should an operation fail, it is recommended that a value greater than zero be used. A value of zero allows unlimited time for an operation to complete and could result in the system hanging (waiting forever) should an operation fail.</p> <p>Press <Enter>, type in a value, and then press <Enter> again to specify a new time-out value.</p>
Queue Tags	<p>Indicates whether to allow the use of queue tags for a device. Currently, the BIOS does not use queue tags. This item specifies queue tag control to higher level device drivers.</p>
Boot Choice	<p>Indicates whether this device may possibly be selected as the boot device. This option is only applicable to devices attached to adapter number zero (in the boot list) on non-BBS systems. It provides primitive BBS flexibility to non-BBS systems.</p>
Format	<p>Press <Enter> to low-level format the device.</p> <p>If enabled, this option allows low-level formatting on a disk drive.</p> <p>Low-level formatting will completely and irreversibly erase all data on the drive.</p> <p>– NOTE Formatting will default the drive to a 512-byte sector size even if the drive had previously been formatted to another sector size.</p>
Verify	<p>Press <Enter> to verify all sectors on the device and to reassign defective Logical Block Addresses (LBAs).</p>
<Restore Defaults>	<p>Press <Enter> to obtain default settings.</p>

Quitting the SCSI BIOS Configuration Utility

Because some changes only take effect after your system reboots, it is important that you exit the SCSI BIOS Configuration Utility properly. To exit, press ESC (Escape key) and respond to the verification prompts that follow.

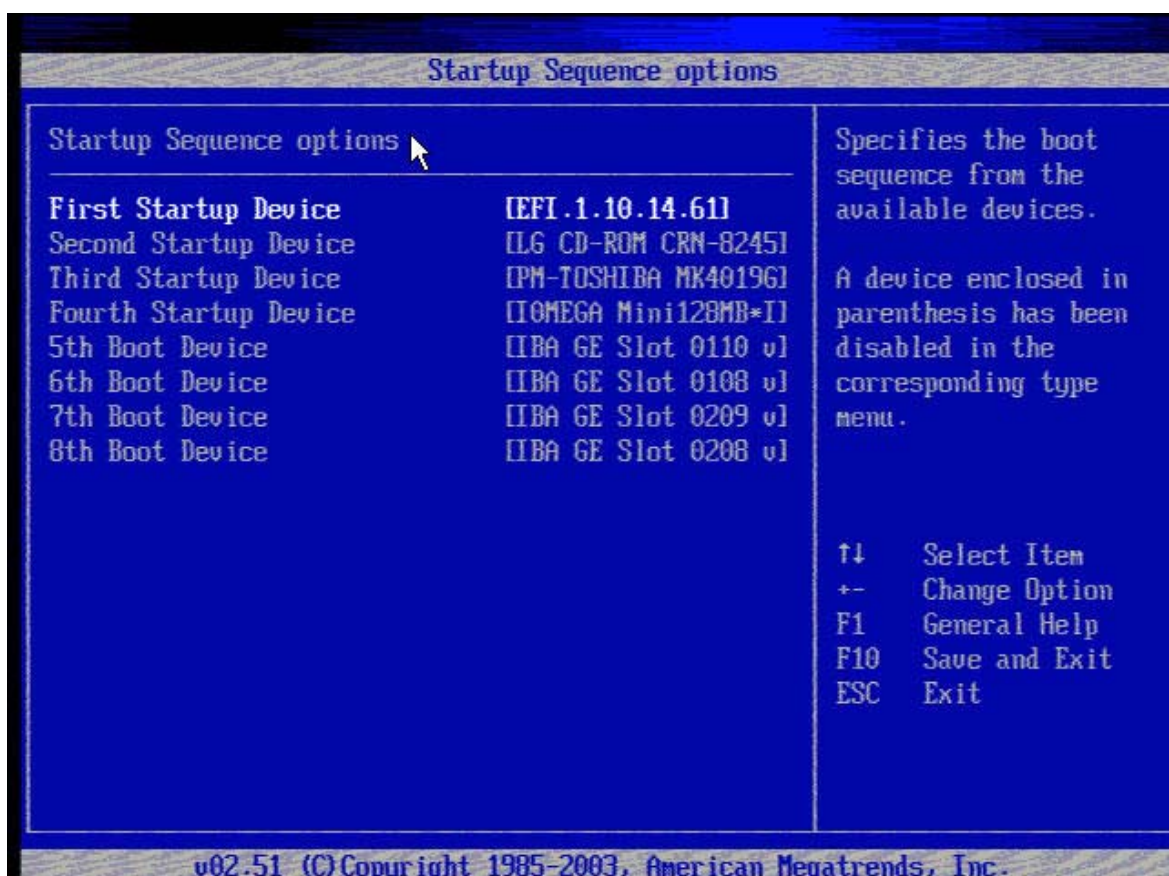
⇒ Important

- ⇒ If you reboot the system without properly exiting from this utility, some changes may not take effect.

Using the Extensible Firmware Interface (EFI)

The Extensible Firmware Interface (EFI) is a shell application that allows other EFI applications to be launched and EFI device drivers to be loaded. The EFI shell provides a set of basic commands that can be used to manage files and EFI NVRAM shell and boot variables. See Table 29 on page 45 for a list of these basic commands. Descriptions of the EFI shell commands are also available from the EFI shell command line by typing `help` and then pressing the <Enter> key. In addition, detailed descriptions of the commands can be viewed and downloaded from the EFI website at <http://developer.intel.com/technology/efi>. To download the files from this website, click on "Tools" and then "EFI Sample Implementation 1.10.14.60". The descriptions can be found in the Microsoft* Word* file named `EFI1.1ShellCommands.doc`.

The EFI Startup option is intended for factory use only. The following figure illustrates the Startup Sequence menu with the first Startup Device set to `EFI.x.xx.xx.xx` (x's represent the version number which can vary).



Selecting the EFI Startup option for any of the eight possible Startup or Boot Device fields is only recommended for factory use. Normal use of the system would not involve booting to the EFI. The following figure shows an additional example of EFI selected in the Boot Device field.



Booting to the EFI

If the EFI boot function is invoked within the startup sequence, you should ensure that the boot process is allowed to complete. Once the boot process completes, the following prompt will appear:

```
Shell >
```

At the Shell prompt, perform a soft reboot of the blade server by typing `Ctrl-Alt-Delete`.

To remove EFI as a startup or boot device, press `F1` during reboot to enter the BIOS Setup Menu. Go to the Startup Options screen, then to the Startup Sequence screen and remove all EFI selection(s) from Startup and Boot Devices.

Table 29. EFI shell commands

EFI Shell Command	Description
alias	Displays, creates, or deletes aliases in the EFI shell
attrib	Displays or changes the attributes of files or directories
bcgf	Displays or modifies the driver or boot configuration
break	Executes a break point
cd	Displays or changes the current directory
cls	Clears the standard output with an optional background color.

Table 29. EFI shell commands

EFI Shell Command	Description
comp	Compares the contents of two files
connect	Binds an EFI driver to a device and starts the driver
cp	Copies one or more files/directories to another location
date	Displays the current date or sets the date in the system
dblk	Displays the contents of blocks from a block device
devices	Displays the list of devices being managed by EFI drivers
devtree	Displays the tree of devices that follow the EFI Driver Model
dh	Displays the handles in the EFI environment
disconnect	Disconnects one or more drivers from a device
dmem	Displays the contents of memory
dmpstore	Displays all NVRAM variables
drivers	Displays the list of drivers that follow the EFI Driver Model
drvcfg	Invokes the Driver Configuration Protocol
drvdiag	Invokes the Driver Diagnostics Protocol
echo	Displays messages or turns command echoing on or off
edit	Edits an ASCII or UNICODE file in full screen
EfiCompress	Compresses a file
EfiDecompress	Decompresses a file
err	Displays or changes the error level
exit	Exits the EFI shell
for	Executes commands for each item in a set of items
getmtc	Displays the current monotonic counter value
goto	Makes batch file execution jump to another location
guid	Displays all the GUIDs in the EFI environment
help	Displays the commands list or verbose help of a command
hexedit	Edits with hex mode in full screen
if	Executes commands in specified conditions
load	Loads optionally connected EFI drivers
loadbmp	Displays a bitmap file onto the screen
LoadPciRom	Loads a PCI Option ROM
is	Displays a list of files and subdirectories in a directory
map	Displays or defines mappings
memmap	Displays the memory map
mkdir	Creates one or more directories
mm	Displays or modifies MEM/IO/PCI

Table 29. EFI shell commands

EFI Shell Command	Description
mode	Displays or changes the mode of the console output device
mount	Mounts a file system on a block device
mv	Moves one or more files/directories to destination
openinfo	Displays the protocols on a handle and the agents
pause	Prints a message and suspends for keyboard input
pci	Displays PCI devices or PCI function configuration space
reconnect	Reconnects one or more drivers from a device
reset	Resets the system
rm	Deletes one or more files or directories
set	Displays, creates, changes or deletes EFI environment variables
setsize	Sets the size of the file
stall	Stalls the processor for some microseconds
time	Displays the current time or sets the time of the system
touch	Updates time with current time
type	Displays the contents of a file
unload	Unloads a protocol image
ver	Displays the version information
vol	Displays volume information of the file system

Configuring the RAID boot order within BIOS

When configuring the IDE drives into a RAID array, the boot order must be re-configured as well. Once the IDE RAID array has been configured, the BIOS boot order is dynamically changed. This places the IDE RAID array at the bottom of the boot order in the eighth device slot position behind the EFI boot device. In order to boot the RAID drives, the boot order must be changed to move the RAID drives to the appropriate boot order position.

3 Diagnostics

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

General checkout

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

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

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

Notes:

1. If multiple error codes are displayed, diagnose the first error code that is displayed.
2. If the server stops with a POST error, go to “Error messages and error codes” on page 78.
3. If the blade server stops and no error is displayed, go to “Undetermined problems” on page 101.
4. For safety information, see “Safety and regulatory information” on page ix.
5. For intermittent problems, check the error log.
6. If blade front panel shows no LEDs, verify blade status and errors in system chassis Web interface; also see “Undetermined problems” on page 101.
7. If device errors occur, see “Error symptoms” on page 68.

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 “Error messages and error codes” on page 78
7. Check the control panel for a lit Blade Error LED; if it is on, see “Identifying problems using the Light Path Diagnostics* feature” on page 54.
8. Check the System Error log. If an error was recorded by the system, see Chapter 5, “BIOS, diagnostics and firmware update procedures,” on page 105.
9. Start the diagnostic programs.
10. Check for the following responses:
 - One beep
 - Readable instructions or the main menu

DID YOU RECEIVE BOTH OF THE CORRECT RESPONSES?

NO. Find the failure symptom in Chapter 5 “BIOS, diagnostics and firmware update procedures” on page 105.

YES. Run the diagnostic programs. If necessary, see “Diagnostic programs and error messages” on page 52.

If you receive an error, see Chapter 5 “BIOS, diagnostics and firmware update procedures” on page 105.

If the diagnostic programs were completed successfully and you still suspect a problem, see “Undetermined problems” on page 101.

Diagnostic tools overview

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

- **POST beep codes**

The power-on self-test beep codes indicate the detection of a problem. See “POST error beep codes” on page 61

- 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.

- **Error symptom charts**

This chart lists problem symptoms and steps to correct the problems. See “Error symptoms” on page 68 for more information.

- **Diagnostic programs and error messages**

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

- **Light Path Diagnostics* feature**

Use the Light Path Diagnostics* feature to identify system errors quickly.

POST error logs

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

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

If POST detects a problem, more than one beep sounds, and an error message appears on your screen. See “POST error beep codes” on page 61 and “Error messages and error codes” on page 78 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 system chassis.

Viewing error logs from the BIOS Setup Utility program

Start the BIOS Setup Utility program; then, select **Error Logs** from the main menu. See “Using the BIOS Setup Utility program” on page 9 for more information.

Diagnostic programs and error messages

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

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

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

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

The error code format is as follows:

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

where:

- fff** is the three-digit function code that indicates the function being tested when the error occurred. For example, function code 089 is for the microprocessor.
- ttt** is the three-digit failure code that indicates the exact test failure that was encountered. (These codes are for trained service personnel; see “Diagnostic error codes” on page 63)
- iii** is the three-digit device ID. (These codes are for trained service personnel; see “Diagnostic error codes” on page 63)
- date** is the date that the diagnostic test was run and the error recorded.
- cc** is the check value that is used to verify the validity of the information.
- text message** is the diagnostic message that indicates the reason for the problem.

Text messages

The diagnostic text message format is as follows:

`Function Name: Result (test specific string)`

where:

Function Name

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

Result

can be one of the following:

- Passed** This result occurs when the diagnostic test is completed without any errors.
- Failed** This result occurs when the diagnostic test discovers an error.

User Aborted

This result occurs when you stop the diagnostic test before it is complete.

Not Applicable

This result occurs when you specify a diagnostic test for a device that is not present.

Aborted

This result occurs when the test could not proceed, for example, because of the system configuration.

Warning

This result occurs when a possible problem is reported during the diagnostic test, such as when a device driver is not found.

test specific string

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

Starting the diagnostic programs

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

Complete the following steps to start the diagnostic programs:

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

— NOTE

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

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

Notes:

- a. If the blade server stops during testing and you cannot continue, restart the blade server and try running the diagnostic programs again. If the problem remains, replace the component that was being tested when the blade server stopped.
- b. The keyboard and mouse (pointing device) tests assume that a keyboard and mouse are attached to the system chassis and that the blade server controls them.
- c. If you run the diagnostic programs with either no mouse or a mouse attached to the system chassis 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 63

Notes:

1. Depending on your server configuration, some of these error messages might not appear when you run the diagnostic programs.
2. If diagnostic error messages appear that are not listed in the error message tables, make sure that your server has the latest levels of BIOS, service processor, and diagnostics microcode installed.

Light Path Diagnostics* feature overview

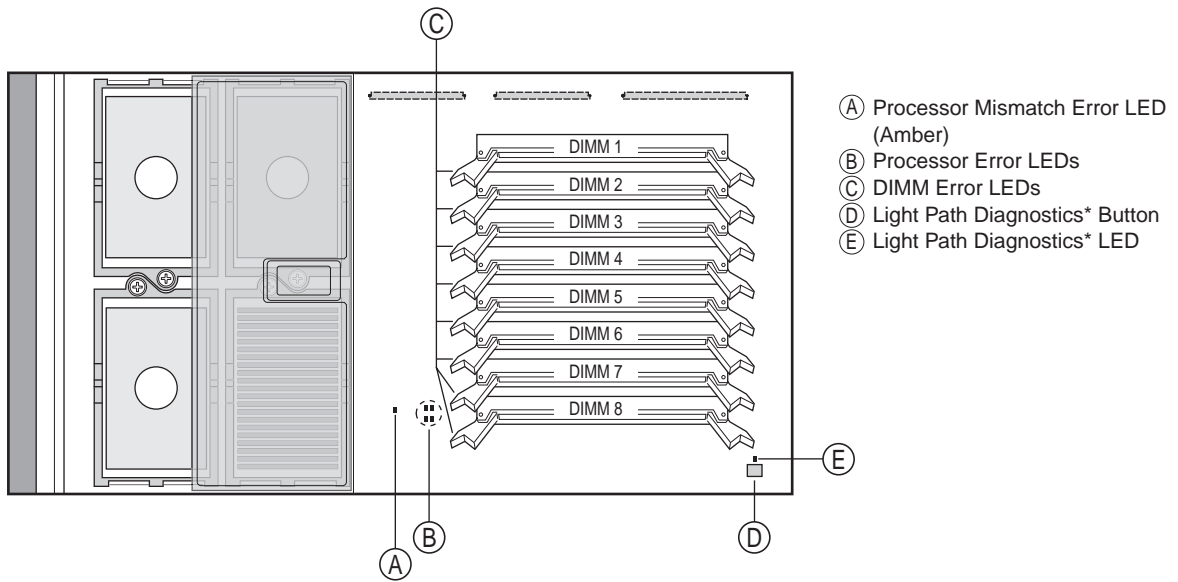
If the system-error LED on the system LED panel on the front or rear of the system chassis is lit, one or more error LEDs on the system chassis components also might be on. These LEDs help identify the cause of the problem.

Identifying problems using the Light Path Diagnostics* feature

Using Light Path Diagnostics*, this section provides information to identify problems that might arise.

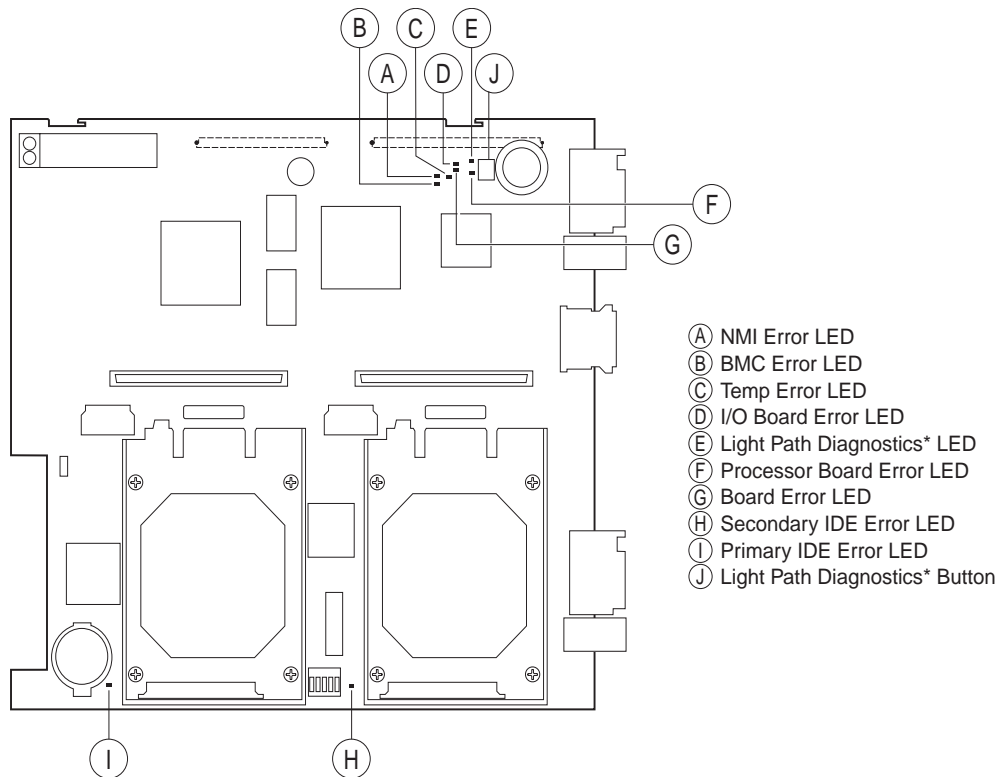
To locate the actual component that caused the error, you must locate the illuminated error LED on that component.

See the following figure for location of the LEDs on the CPU board.



TP00447

The following figure shows the location of the LEDs on the I/O board.



TP00382

For example:

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

1. Remove the blade server from the system chassis (see "Removing the blade server from the system chassis" in the *Intel Server Compute Blade SBX44: Installation and User's Guide*).
2. Place the blade server on a flat, non-conductive surface.
3. Remove the cover from the blade server (see "Opening the blade server cover" in the *Intel Server Compute Blade SBX44: Installation and User's Guide*).
4. Press and hold the Light Path Diagnostics* button to relight the LEDs that were lit before you removed the blade server from the system chassis. The LEDs will remain illuminated for as long as you press the button, to a maximum of 25 seconds.

Use the table at "Light Path Diagnostic* LEDs" on page 67 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" in the *Intel Server Compute Blade SBX44: Installation and User's Guide*.

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 68).

If you cannot find the problem in the error symptom charts, go to "Starting the diagnostic programs" on page 53 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 92

— NOTE

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

Recovering the BIOS code

(Latest recovery steps may change with new BIOS.)

If your BIOS code has become damaged, such as from a power failure during a flash update, the blade server may appear to be nonfunctional (no video, no beeps). You can recover your BIOS code using the BIOS code page jumper (J1E2) and a BIOS flash diskette.

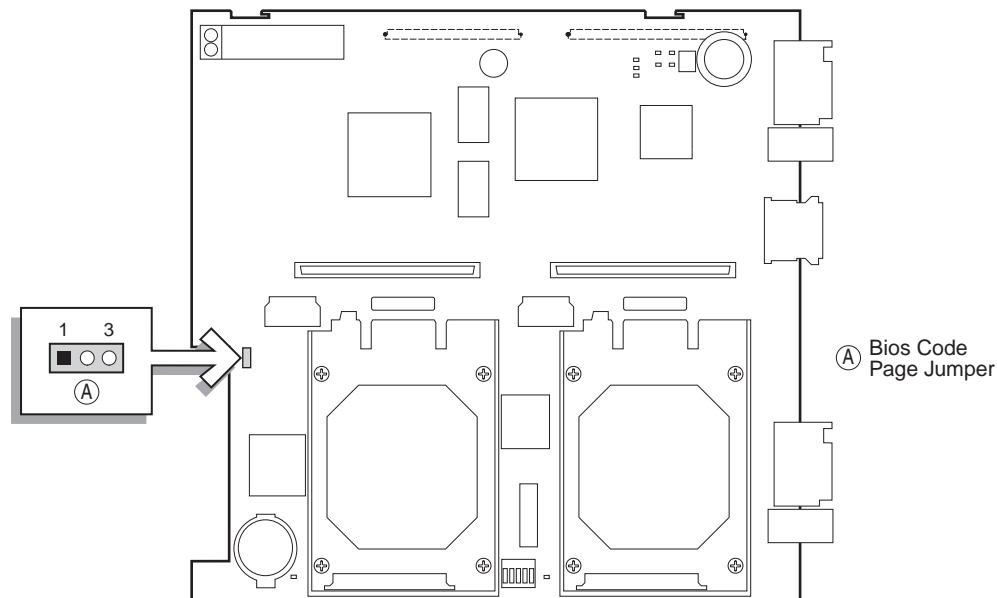
— NOTE

To obtain a BIOS flash diskette, contact your Intel support representative.

The flash memory of your server consists of a primary page and a backup page. The J1E2 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 system chassis (see "Removing the blade server from the system chassis" in the *Intel® Server Compute Blade SBX44: Installation and User's Guide*).
3. Remove the cover (see "Opening the blade server cover" in the *Intel® Server Compute Blade SBX44: Installation and User's Guide*).
4. Locate jumper J1E2 (BIOS code page jumper) on the I/O board.



TP00383

5. Move the J1E2 jumper to pins 2 and 3 to enable BIOS recovery mode.
6. Replace the cover and reinstall the blade server in the system chassis, making sure the blade server controls all relevant components.
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. Select your language (0 through 5) and press Enter to accept your choice.
Attention: Do *not* restart the blade server at this time.
Remove the flash diskette from the diskette drive.
12. Turn off the blade server, remove it from the system chassis, and remove the cover of the blade server.
13. Move the J1E2 jumper to pins 1 and 2 to return to normal startup mode.
14. Replace the cover and reinstall the blade server in the system chassis; then restart the blade server. The system starts up.



 **CAUTION:**

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

Clearing the CMOS

You can clear the CMOS on your system by completing the following steps:

1. Power down the blade server.
2. Remove the blade server from the system chassis (see "Removing the blade server from the system chassis" in the *Intel® Server Compute Blade SBX44: Installation and User's Guide*).
3. Remove the cover (see "Opening the blade server cover" in the *Intel® Server Compute Blade SBX44: Installation and User's Guide*).
4. Locate the Config DIP Switch block (at location S6H1) on the I/O board. Set the CMOS clear switch (the middle switch #3) to the ON position.
5. Replace the cover and reinstall the blade server in the system chassis.
6. Power the blade server back up.
7. During POST, the following message will appear on the monitor, requesting that the Clear CMOS Switch be set to OFF and the system rebooted.



8. Power down the blade server.
9. Remove the blade server from the system chassis. Remove the cover.
10. Reset the CMOS clear switch (the middle switch #3 of the Config DIP Switch block) to the OFF position.
11. Replace the cover and reinstall the blade server in the system chassis.
12. Power the blade server back up.

4 System error reference

Use this system error reference to aid in localizing failing or failed system components.

Notes:

1. Check the configuration before you replace a FRU. Configuration problems can cause false errors and symptoms.
2. Always start with “General checkout” on page 49.

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

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

— NOTE

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

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

— NOTE

Try reseating a suspected component or reconnecting a cable before replacing the component.

Beep codes

Beep codes are short tones or a series of short tones, sometimes separated by pauses that indicate system error conditions. It is important to note that both the system BIOS and Baseboard Management Controller (BMC) emit beep codes (see the following two sections).

POST error beep codes

The following table lists the POST error beep codes. Prior to system video initialization, the BIOS uses these beep codes to inform users of error conditions.

Table 30. BIOS generated beep codes

Number of Beeps	Description	FRU/Action
1	Memory refresh timer error	1. DIMM 2. CPU board
6	Keyboard controller BAT test error	1. I/O board 2. CPU board

Table 30. BIOS generated beep codes

Number of Beeps	Description	FRU/Action
7	General exception error	1. I/O board 2. CPU board
5 short 1 long	No memory found in system	1. Install or reseal memory, then perform a blade server reset 2. DIMMs 3. CPU board
6 short 1 long	Memory is not DDR type	1. Replace with supported DIMMs 2. DIMMs 3. CPU board
7 short 1 long	SMBUS error. Memory enumeration can not proceed.	1. CPU board 2. I/O board

BMC-generated beep codes

The following table lists the beep codes that are generated by the BMC in response to certain failed conditions. Each digit in the code is represented by a sequence of beeps whose count is equal to the digit.

Table 31. BMC-generated beep codes

Number of Beeps	Description	FRU/Action
1-5-1-1	FRB3 failure (processor failure)	1. Processor 2. CPU board
1-5-2-3	CPU: Configuration Error (VID mismatch, population rules violation, processor mismatch)	1. Ensure all processors are supported by the BIOS and of the same family, model, stepping, speed, and cache size 2. Processor
1-5-4-2	Power fault: DC power unexpectedly lost (power control failures)	1. Reseat blade server and power cycle the blade server 2. Reseat DC power cable 3. CPU board 4. I/O board

Table 31. BMC-generated beep codes

Number of Beeps	Description	FRU/Action
1-5-4-4	Power control fault	<ol style="list-style-type: none"> 1. Reseat blade server and power cycle the blade server 2. CPU board 3. I/O board

No-beep symptoms

– NOTE	
See “System” on page 130 to determine which components should be replaced by a field service technician.	
No-beep symptom	FRU/Action
No beep and no video (System error LED is OFF)	1. See “Undetermined problems” on page 101.
No beep and no video (System Attention LED is ON)	1. See “Identifying problems using the Light Path Diagnostics* feature” on page 54

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.

– NOTE	
See “System” on page 130 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/Action
001-XXX-000 (Failed core tests)	1. CPU board
001-XXX-001 (Failed core tests)	1. CPU board

– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/Action
001-250-000 (Failed CPU board ECC)	1. CPU board
001-250-001 (Failed CPU board ECC)	1. CPU board
005-XXX-000 (Failed video test)	1. CPU board
030-XXX-000 (Failed internal SCSI interface test)	1. SCSI storage expansion unit 2. CPU board
035-XXX-099	1. No adapters were found. 2. If adapter is installed re-check connection.
075-XXX-000 (Failed power supply test)	1. Power supply
089-XXX-001 (Failed microprocessor test)	1. Microprocessor 1 2. CPU board
089-XXX-002 (Failed optional microprocessor test)	1. Optional microprocessor 2 2. CPU board
165-060-000 (Service Processor: ASM may be busy)	1. Rerun the diagnostic test. 2. Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel. 3. Power down blade server and reseal it in chassis. 4. CPU board.
165-198-000 (Service Processor: Aborted)	1. Rerun the diagnostic test 2. Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel. 3. Power down blade server and reseal it in chassis. 4. CPU board.
165-201-000 (Service Processor: Failed)	1. Power down blade server and reseal it in chassis. 2. CPU board.
165-330-000 (Service Processor: Failed)	1. Update to the latest ROM diagnostic level and retry.
165-342-000 (Service Processor: Failed)	1. Ensure latest firmware levels for ASM and BIOS are installed. 2. Power down blade server and reseal it in chassis. 3. CPU board.
166-198-000 System Management: Aborted (Unable to communicate with ASM. It may be busy. Run the test again.)	1. Run the diagnostic test again. 2. Correct other error conditions and retry. These include other failed system management tests and items logged in the System Error Log of the management module. 3. Power down blade server and reseal it in chassis. 4. CPU board.

– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.	
Error code/symptom	FRU/Action
166-201-001 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> DIMMs CPU board
166-201-002 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> Reseat I2C cable between the operator information card and the CPU board. Operator information card. CPU board.
166-201-003 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> I/O adapter CPU board
166-201-004 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> SCSI storage expansion unit CPU board
166-201-005 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	<ol style="list-style-type: none"> DIMMs Microprocessors CPU board
166-342-000 System Management: Failed (ASM adapter BIST indicate failed tests.)	<ol style="list-style-type: none"> Ensure the latest firmware levels for Remote Supervisor Adapter and BIOS are installed. Power down blade server and reseat it in chassis. Remote Supervisor Adapter.
166-400-000 System Management: Failed (ISMP self test result failed tests: x where x = Flash, RAM, or ROM.)	<ol style="list-style-type: none"> Reflash or update firmware for ISMP. CPU board
167-300-XXX ISMP: Failed (ISMP indicates failure in self test.)	<ol style="list-style-type: none"> Reflash or update firmware for ISMP. I/O board
167-400-001 ISMP: Failed (ISMP failed to communicate with I/O board.)	<ol style="list-style-type: none"> I/O board
167-400-002 ISMP: Failed (ISMP failed to communicate with CPU board.)	<ol style="list-style-type: none"> CPU board I/O board
167-400-003 ISMP: Failed (ISMP failed to communicate with processor(s).)	<ol style="list-style-type: none"> CPU board I/O board Processor(s)
167-400-004 ISMP: Failed (ISMP failed to communicate with DIMMs.)	<ol style="list-style-type: none"> CPU board I/O board DIMM(s)
180-XXX-000 (Diagnostics LED failure)	<ol style="list-style-type: none"> Run diagnostics panel LED test for the failing LED.
180-XXX-001 (Failed front LED panel test)	<ol style="list-style-type: none"> Front panel I/O board

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
Error code/symptom	FRU/Action
<p>180-XXX-002 (Failed diagnostics LED panel test)</p>	<p>1. CPU board</p>
<p>180-XXX-003 (Failed CPU board LED test)</p>	<p>1. CPU board</p>
<p>180-XXX-005 (Failed SCSI backplane LED test)</p>	<p>1. SCSI storage expansion unit 2. CPU board</p>
<p>201-XXX-0nn (Failed memory test.)</p>	<p>1. DIMM Location slots 1-4 where <i>nn</i> = DIMM location. – NOTE <i>nn</i> 1=DIMM 1; 2=DIMM 2; 3=DIMM 3; 4=DIMM 4. 2. CPU board.</p>
<p>201-XXX-999 (Multiple DIMM failure, see error text)</p>	<p>1. See error text for failing DIMMs. 2. CPU board.</p>
<p>202-XXX-001 (Failed system cache test)</p>	<p>1. Microprocessor 1 2. CPU board</p>
<p>202-XXX-002 (Failed system cache test)</p>	<p>1. Microprocessor 2 2. CPU board</p>
<p>217-198-XXX (Could not establish drive parameters)</p>	<p>1. SCSI storage expansion unit</p>
<p>217-XXX-000 (Failed hard disk drive test)</p> <p>– NOTE If RAID is configured, the hard disk drive number refers to the RAID logical array.</p>	<p>1. Hard disk drive 1</p>
<p>217-XXX-001 (Failed hard disk test)</p> <p>– NOTE If RAID is configured, the hard disk number refers to the RAID logical array.</p>	<p>1. Hard disk drive 2</p>
<p>405-XXX-000 (Failed Ethernet test on controller on the CPU board)</p>	<p>1. Verify that Ethernet is not disabled in BIOS. 2. CPU board.</p>

Light Path Diagnostic* LEDs

Lit LED	Cause	Action
None	An error has occurred and cannot be isolated, or the service processor has failed.	An error has occurred that is not represented by a Light Path Diagnostics* LED. Check the system error log for more information about the error.
DIMM Error LEDs (1 per DIMM)	DIMM failure (detected by BIOS) or no usable DIMMs present.	Reseat the DIMM indicated by the lit DIMM failure LED. If the problem remains, replace the DIMM. – NOTE Multiple DIMM LEDs do not necessarily indicate multiple DIMM failures. If more than one DIMM LED is on, reseat/replace one DIMM at a time until error goes away. Refer to the chassis management module system error log for further isolation.
CPU board Fault LED	The integrated VRM on the blade server CPU board has failed.	<ol style="list-style-type: none"> To verify error, replace the blade server cover, reinsert the blade server in the system chassis, then restart the blade server. Replace the blade CPU board.
I/O Board Fault LED	The integrated VRM on the blade server I/O board has failed.	<ol style="list-style-type: none"> To verify error, replace the blade server cover, reinsert the blade server in the chassis, then restart the blade server. Replace the blade I/O board.
Board Temperature Error LED	The system temperature has exceeded a high threshold level or a processor ThermTrip has occurred.	<ol style="list-style-type: none"> Check to see if a blower on the system chassis has failed. If it has, replace the blower. Make sure the room temperature is not too high. (See “Features and specifications” on page 3 for specific room temperature requirements.) Check Management Module for ThermTrip errors and replace processors as needed.
Processor Error LEDs (1 per processor)	The microprocessor corresponding to the LED has failed.	Verify that the microprocessor indicated by the lit LED is installed correctly. If the problem remains, replace the microprocessor.
Processor Mismatch LED	The processors do not match.	Verify that the microprocessors are the same cache size and type, and operate at the same clock speed (internal and external clock frequencies must be identical).

Lit LED	Cause	Action
BMC Fault LED	The BMC self test has detected a failure.	<ol style="list-style-type: none"> 1. Reseat and re-initialize the blade server I/O board. 2. If the problem persists, replace the blade server I/O board.
NMI error	A non-maskable interrupt has occurred.	<ol style="list-style-type: none"> 1. Replace the blade server cover, reinsert the blade server in the system chassis and then restart the blade server. 2. Check the system error log for information about the error. <p>If the problem remains, replace the blade server CPU board and/or I/O board.</p>
Board Fault LED	An I/O board connector failure has occurred.	Check all interconnecting cables between the blade server I/O board and the blade server CPU board for proper seating.

Error symptoms

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

If you cannot find the problem in the error symptom charts, go to “Starting the diagnostic programs” on page 53 to test the server.

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

- Remove the software or device that you just added.
- Run the diagnostic tests to determine if your server is running correctly.
- Reinstall the new software or new device.

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

– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.	
CD-ROM drive problems	
Symptom	FRU/Action
CD-ROM drive is not recognized.	<ol style="list-style-type: none"> 1. Verify that: <ul style="list-style-type: none"> • All cables and jumpers are installed correctly. • The correct device driver is installed for the CD-ROM drive. 2. Run CD-ROM drive diagnostics. 3. CD-ROM drive.

<p>– NOTE 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 is not working properly.	<ol style="list-style-type: none"> 1. Clean the CD. 2. Run CD-ROM drive diagnostics. 3. CD-ROM drive.
CD-ROM drive tray is not working. (The computer must be turned on.)	<ol style="list-style-type: none"> 1. Insert the end of a straightened paper clip into the manual tray-release opening. 2. Run CD-ROM drive diagnostics. 3. CD-ROM drive.

<p>– NOTE 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
Diskette drive activity LED stays on, or the system bypasses the diskette drive.	<ol style="list-style-type: none"> 1. If there is a diskette in the drive, verify that: <ul style="list-style-type: none"> • The diskette is inserted correctly in the drive. • The diskette is good and not damaged. (Try another diskette if you have one.) <ul style="list-style-type: none"> — The drive light comes on (one-second flash) when the diskette is inserted. • The diskette contains the necessary files to start the computer. • The diskette drive is enabled in the BIOS Setup Utility program. • The software program is working properly. • The cable is installed correctly (in the proper orientation). 2. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.). 3. Cable. 4. Run diskette drive diagnostics. 5. Diskette drive. 6. Media tray card.

<p>– NOTE 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"> 1. Verify that the enclosure is installed correctly. 2. For more information, see your SCSI storage expansion unit documentation.

<p>– NOTE 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"> 1. Remove the first drive not recognized and try the hard disk drive diagnostic test again. 2. If the remaining drives are recognized, replace the drive you removed with a new one.
System stops responding during hard disk drive diagnostic test.	<ol style="list-style-type: none"> 1. Remove the hard disk drive being tested when the computer stopped responding and try the diagnostic test again. 2. If the hard disk drive diagnostic test runs successfully, replace the drive you removed with a new one.

<p>– NOTE 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	<ol style="list-style-type: none"> 1. Broken CRU/FRU

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Intermittent problems</p>	
Symptom	FRU/Action
A problem occurs only occasionally and is difficult to detect.	<ol style="list-style-type: none"> Verify that: <ul style="list-style-type: none"> When the computer is turned on, air is flowing from the rear of the computer at the blower grill. If there is no airflow, the blower is not working. This causes the computer to overheat and shut down. Ensure that the SCSI bus and devices are configured correctly.

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Keyboard, mouse, or pointing-device problems</p>	
Symptom	FRU/Action
All or some keys on the keyboard do not work.	<ol style="list-style-type: none"> Verify that: <ul style="list-style-type: none"> The keyboard cable is securely connected to the chassis management module, and the keyboard and mouse cables are not reversed. Both the computer and the monitor are turned on. Keyboard. Management module on the system chassis; see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i> on the system chassis <i>Resource CD</i>.
The mouse or pointing device does not work.	<ol style="list-style-type: none"> Verify that: <ul style="list-style-type: none"> The mouse or pointing-device cable is securely connected to the chassis management module, and that the keyboard and mouse cables are not reversed. The mouse works correctly with other blade servers. The mouse device drivers are installed correctly. Both the computer and the monitor are turned on. The mouse is recognized as a USB device, not PS2, by your blade server. Although the mouse is a PS2-style device, communication with the mouse is through an internal USB bus in the system chassis. Some operating systems permit you to select the type of mouse during installation of the operating system. Select USB. Mouse or pointing device. Management module on the system chassis; see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i> on the system chassis <i>Resource CD</i>.

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Keyboard, mouse, or pointing-device problems</p>	
Symptom	FRU/Action
<p>Mouse function lost during Red Hat installation.</p>	<p>If, while installing Red Hat* Linux 9.0 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.</p> <p>Do not switch KVM owners until the installation process begins to install the packages (after the 'About to Install' window).</p>

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Memory problems</p>	
Symptom	FRU/Action
<p>The amount of system memory displayed is less than the amount of physical memory installed.</p>	<ol style="list-style-type: none"> 1. Verify that: <ul style="list-style-type: none"> • The memory modules are seated properly. • You have installed the correct type of memory. • If you changed the memory, you updated the memory configuration with the Configuration/Setup Utility program. • All banks of memory on the DIMMs are enabled. The computer might have automatically disabled a DIMM bank when it detected a problem or a DIMM bank could have been manually disabled. 2. Check POST error log for error message 289: <ul style="list-style-type: none"> • If the DIMM was disabled by a system-management interrupt (SMI), replace the DIMM. • If the DIMM was disabled by the user or by POST: <ol style="list-style-type: none"> a. Start the BIOS Setup Utility program. b. Enable the DIMM. c. Save the configuration and restart the computer. 3. DIMM. 4. CPU board.

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Microprocessor problems</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"> 1. Verify that the startup microprocessor is seated properly. 2. Startup microprocessor.

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Monitor problems</p>	
Symptom	FRU/Action
Testing the monitor.	<ol style="list-style-type: none"> 1. See the information that comes with the monitor for adjusting and testing instructions.
Only the cursor appears.	<ol style="list-style-type: none"> 1. Verify that the keyboard, video and mouse on the system chassis have not been switched to another blade server. If the problem remains, see “Undetermined problems” on page 101.
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.	<p>Verify that the monitor cable is connected to the video port on the chassis management module. Some monitors have their own self-tests. If you suspect a problem with your monitor, see the information that comes with the monitor for adjusting and testing instructions.</p> <p>If you still cannot find the problem, try using the monitor with another blade server. If the problem persists, see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i> on the system chassis <i>Resource CD</i>.</p>
The screen is wavy, unreadable, rolling, distorted, or has screen jitter.	<ol style="list-style-type: none"> 1. If the monitor self-tests show the monitor is working properly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. (Moving a color monitor while it is turned on might cause screen discoloration.) Then move the device and the monitor at least 305 mm (12 in.) apart. Turn on the monitor. Notes: <ol style="list-style-type: none"> a. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.). 2. Monitor. 3. CPU board.
Wrong characters appear on the screen.	<ol style="list-style-type: none"> 1. If the wrong language is displayed, update the firmware or operating system with the correct language in the blade server that has ownership of the monitor. 2. Monitor. 3. CPU board.

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Monitor problems</p>	
Symptom	FRU/Action
No video.	<ol style="list-style-type: none"> 1. Make sure the correct machine is selected, if applicable. 2. Make sure all cables are locked down.

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Option problems</p>	
Symptom	FRU/Action
An Intel option that was just installed does not work.	<ol style="list-style-type: none"> 1. Verify that: <ul style="list-style-type: none"> • The option is designed for the computer. • You followed the installation instructions that came with the option. • The option is installed correctly. • You have not loosened any other installed options or cables and that all option hardware and cable connections are secure. • If the failing option is a SCSI storage expansion unit: <ul style="list-style-type: none"> — The cables for the SCSI expansion unit are connected correctly. — If the SCSI storage expansion unit has been removed, verify that the socket is terminated correctly. — The external SCSI expansion unit is turned on. You must turn on the external SCSI expansion unit before turning on the computer. • You updated the configuration information in the BIOS Setup Utility program. Whenever memory or an option is changed, you must update the configuration. 2. If the option comes with its own test instructions, use those instructions to test the option. 3. Replace the option you just installed.

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Power problems</p>	
Symptom	FRU/Action
Power switch does not work and reset button, if supported, does work.	<ol style="list-style-type: none"> 1. Reseat connector. 2. Front bezel with customer card. 3. CPU board.

– 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"> 1. Verify that: <ol style="list-style-type: none"> a. The power LED on the front of the system chassis is on. b. The LEDs on all the system chassis power modules are on. c. If the blade server or attached storage expansion unit is in blade bay 7-14, power modules are in power bays 1, 2, 3 and 4. d. The power-on LED on the blade server control panel is blinking slowly. <ul style="list-style-type: none"> • 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 3 • If the power LED is off, the blade bay is not receiving power, the blade server is defective, or the LED information panel is loose or defective. e. Local power control for the blade server is enabled (use the chassis management module Web interface to verify), or the blade server was instructed through the management module (Web interface) to turn on. 2. If you just installed an option in the blade server, remove it, and restart the blade server. If the blade server now turns on, you might have installed more options than the power to that blade bay supports. 3. Try another blade server in the blade bay; if it works, replace the faulty blade server. 4. See “Undetermined problems” on page 101.
<p>The blade server does not turn on and the following conditions are present:</p> <ol style="list-style-type: none"> 1. The amber system error LED on the Blade Center unit's system LED panel is lit; 2. The amber blade error LED on the blade server's LED panel is lit; and 3. The system error log contains the message "CPUs mismatched". 	<p>The microprocessor with the lowest feature set and stepping level must be used as the Bootstrap Processor (microprocessor 1 in location U66; see "CPU board illustration" in the <i>Intel Server Compute Blade SBX44: Installation and User's Guide</i>). Move the microprocessor in location U66 to location U70, and move the microprocessor in location U70 to location U66.</p>
<p>The blade server turns off for no apparent reason</p>	<ol style="list-style-type: none"> 1. Verify that all blade bays have a blade server, expansion unit, or filler blade properly installed. If these components are missing or improperly installed, an over-temperature condition may result in shutdown. 2. If microprocessor LED is illuminated, replace the microprocessor.

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Power problems</p>	
Symptom	FRU/Action
The computer does not turn off.	<ol style="list-style-type: none"> 1. Verify whether you are using an ACPI or non-ACPI operating system. If you are using a non-ACPI operating system: <ol style="list-style-type: none"> a. Press Ctrl+Alt+Delete. b. Turn off the system by holding the power-control button for 4 seconds. c. If computer fails during BIOS POST and power-control button does not work, remove the blade server from the bay and reseal it. 2. If the problem remains or if you are using an ACPI-aware operating system, suspect the CPU board.

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

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Universal Serial Bus (USB) port problems</p>	
Symptom	FRU/Action
A USB device does not work.	<p>1. Verify that:</p> <ul style="list-style-type: none"> • The correct USB device driver is installed. • The operating system supports USB devices.

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
<p>Network connection problems</p>	
Symptom	FRU/Action
One or more blade servers are unable to communicate with the network.	<p>Verify that:</p> <ul style="list-style-type: none"> • The switch modules for the network interface being used are installed in the correct system chassis bays and are configured and operating correctly. See the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i> on the system chassis <i>Resource CD</i> for details. • The settings in the switch module are appropriate for the blade server (settings in the switch module are blade-specific). <p>If you installed an I/O expansion option, verify that:</p> <ul style="list-style-type: none"> • The option is designed for the blade server. • You followed the installation instructions that came with the option. • The option is installed correctly. • You have not loosened any other installed options or cables. • You updated the configuration information in the BIOS Setup Utility program. Whenever memory or an option is changed, you must update the configuration. <p>If the problem remains, see “Undetermined problems” on page 101.</p>

– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.	
Service processor problems	
Symptom	FRU/Action
Service processor in the management module reports a general monitor failure.	Disconnect the system chassis from all electrical sources, wait for 30 seconds, reconnect the system chassis to the electrical sources, and restart the server. If the problem remains, see “Undetermined problems” on page 101 and the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i> on the system chassis <i>Resource CD</i>

Error messages and error codes

The system BIOS displays error messages on the video screen during POST if errors are detected. POST error codes are logged in the event log.

– NOTE

The Server Compute Blade SBX44 has local SEL logging capability. The local SEL is stored in and updated by the BMC. This should not be confused with the SEL logging ability of the management module which provides system wide SEL logging. The local SEL may only be accessed by using the System Setup Utility (SSU) SEL Viewer utility. Refer to “Viewing the System Event Log (SEL)” on page 118 for information on using the SSU SEL Viewer. SEL entries logged by the BMC versus SEL entries logged by the management module may be different for the same event type.

POST error codes and messages

The BIOS will output the current boot progress codes on the video screen. The progress codes may be reported by system BIOS or option ROMs.

The "Response" section in the following table is divided into three different types:

- **Warning** - The message is displayed on the screen and the error is logged to the System Event Log (SEL). The system will continue booting with a degraded state. You may want to replace the erroneous unit.
- **Pause** - The message is displayed on screen and the error is logged to the SEL; user input is required to continue. You can take immediate corrective action or choose to continue booting.
- **Halt** - The message is displayed on the screen and the error is logged to the SEL; the system will not boot unless the error is resolved. You need to replace the faulty part and restart the system.

A DOS-based SEL Viewer utility can be used to view the events logged in the SEL. The SEL is implemented as a non-volatile storage to ensure that critical events can be retrieved for "post-mortem" analysis should a system failure occur.

Table 32. POST Error Codes and Messages

Error Code	Error Message	Response	FRU/Action
0000	Timer error	Warning	1. Run diagnostics 2. Battery 3. I/O board
0005	CMOS Checksum Bad Loading defaults	Warning	1. Message is informational. No user action required.
0012	CMOS Date/Time not set	Warning	1. Enter BIOS setup utility and set the date and time
0040	Refresh timer test failed	Halt	1. I/O board 2. CPU board
0044	DMA Controller Error	Halt	1. I/O board
0045	DMA-1 Error	Halt	1. I/O board
0046	DMA-2 Error	Halt	1. I/O board
	Password Check Failed	Halt	1. User needs to enter correct password
004C	Keyboard/Interface Error	Warning	1. I/O board
004D	Primary Master Hard Disk Error	Warning	1. Reseat primary hard disk 2. Run diagnostics 3. Primary hard disk 4. I/O board
004F	Secondary Master Hard Disk Error	Warning	1. Reseat secondary hard disk 2. Run diagnostics 3. Secondary hard disk 4. I/O board
0055	Primary Master Drive - ATAPI Incompatible	Warning	1. Primary master drive
0057	Secondary Master Drive - ATAPI Incompatible	Warning	1. Secondary master drive
005D	ATA SMART failure error (Dynamic string)	Warning	1. ATA drive
289	DIMM D? and D? - Non Matching or Missing DIMMs - User has not populated DIMMs correctly	Warning	1. Verify the affected DIMM and replace with correct memory
289	DIMM D? and D? disabled - DIMMs failed POST Reliability test	Warning	1. Verify the affected DIMM and replace with correct memory

Table 32. POST Error Codes and Messages

Error Code	Error Message	Response	FRU/Action
8160	Processor missing microcode	Halt	<ol style="list-style-type: none"> 1. Update BIOS 2. Check latest BIOS release notes for supported processors 3. Replace processor with supported processor 4. Upgrade BIOS to enhance the supported processor list if needed
8180	BIOS does not support current Px stepping	Halt	<ol style="list-style-type: none"> 1. Replace processor 2. Ensure all processors are same stepping, speed, family and cache size 3. Ensure all processors are supported by checking the BIOS release notes 4. Upgrade BIOS to enhance the supported processor list if needed
8192	Cache size mismatch	Halt	<ol style="list-style-type: none"> 1. Replace processor 2. Ensure all processors are same stepping, speed, family and cache size
8193	CPUID, processor stepping is different	Warning	<ol style="list-style-type: none"> 1. Ensure all processors are of the same stepping, family, model and speed (e.g., C0, C1) 2. Replace processor
8194	CPUID, processor family is different	Halt	<ol style="list-style-type: none"> 1. Ensure all processors are of the same family and model 2. Replace processor
8196	CPUID, processor model is different	Halt	<ol style="list-style-type: none"> 1. Ensure all processors are of the same family and model 2. Replace processor
8197	Processor speeds mismatched	Halt	<ol style="list-style-type: none"> 1. Ensure all processors are of the same stepping, family, model and speed (e.g., C0, C1) 2. Replace processor
8110	Processor 1 Internal error (IERR)	Warning	<ol style="list-style-type: none"> 1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P1.

Table 32. POST Error Codes and Messages

Error Code	Error Message	Response	FRU/Action
8111	Processor 2 Internal error (IERR)	Warning	1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P2.
8112	Processor 3 Internal error (IERR)	Warning	1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P3.
8113	Processor 4 Internal error (IERR)	Warning	1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P4.
8120	Processor 1 Thermal Trip error	Warning	1. Check cooling 2. Replace blowers if needed 3. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P1.
8121	Processor 2 Thermal Trip error	Warning	1. Check cooling 2. Replace blowers if needed 3. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P2.
8122	Processor 3 Thermal Trip error	Warning	1. Check cooling 2. Replace blowers if needed 3. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P3.
8123	Processor 4 Thermal Trip error	Warning	1. Check cooling 2. Replace blowers if needed 3. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P4.
8130	Processor 1 disabled	Warning	1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P1.
8131	Processor 2 disabled	Warning	1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P2.
8133	Processor 3 disabled	Warning	1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P3.

Table 32. POST Error Codes and Messages

Error Code	Error Message	Response	FRU/Action
8134	Processor 4 disabled	Warning	1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P4.
8140	Processor 1 failed FRB-3 timer	Warning	1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P1.
8141	Processor 2 failed FRB-3 timer	Warning	1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P2.
8142	Processor 3 failed FRB-3 timer	Warning	1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P3.
8143	Processor 4 failed FRB-3 timer	Warning	1. Enter BIOS Setup Utility and enable processor retest. If errors persist, replace processor P4.
8300	Baseboard Management Controller failed to function	Pause	1. Reflash the BMC and SDRs with the most current versions that are compatible with your system configuration 2. I/O board
84F2	Server Management Interface Failed	Pause	1. Reflash the BMC and SDRs with the most current versions that are compatible with your system configuration 2. I/O board
84F3	BMC in Update Mode	Pause	1. The BMC recovery jumper is in the active position and the BMC can be reflashed 2. After reflashing, move the jumper to the inactive position
84F4	Sensor Data Record Empty	Pause	1. Reflash the BMC and SDRs with the most current versions that are compatible with your system configuration 2. I/O board 3. CPU board
84FF	System Event Log Full	Warning	1. Clear the SEL log in the BIOS Setup Utility

System Event Log (SEL) messages

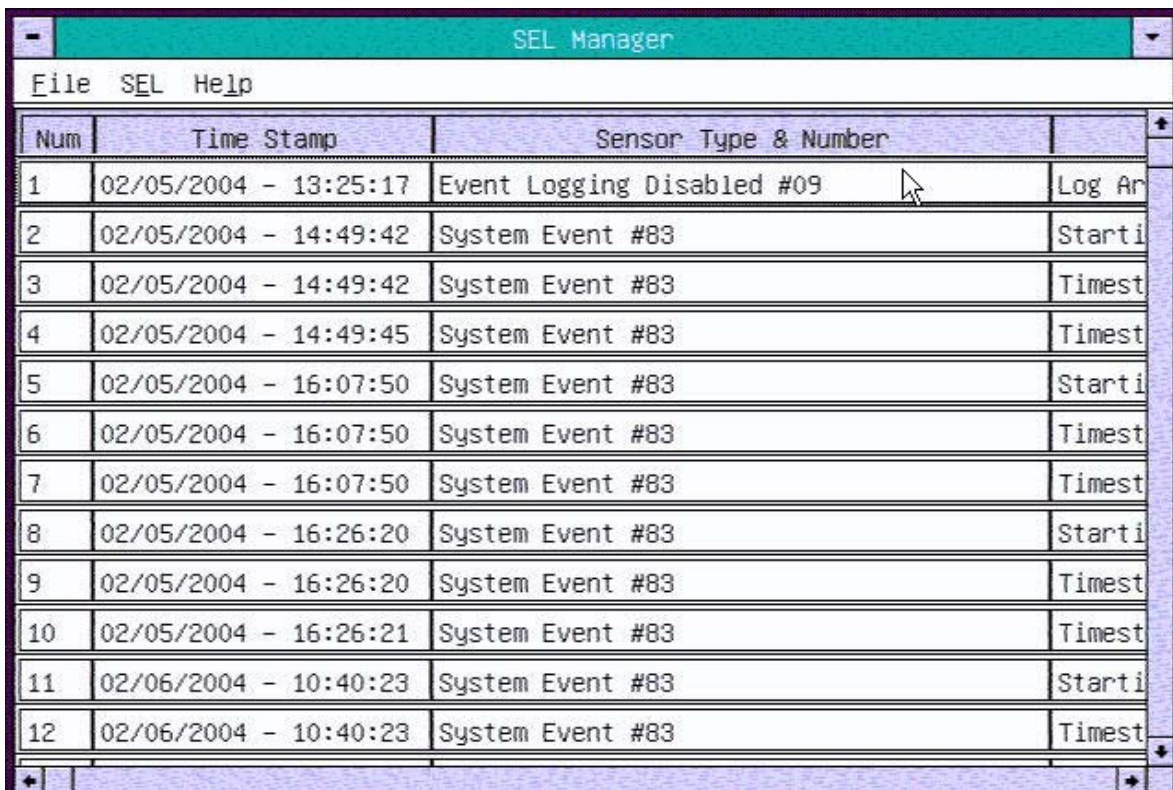
The SEL Viewer is used to view the SEL records for Intel® Xeon™-based servers.

The SEL viewer provides support for performing the following functions:

- 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.

Five columns of SEL data can be viewed from the SEL Viewer Utility:

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



The screenshot shows the SEL Manager utility window. The title bar reads "SEL Manager". The menu bar includes "File", "SEL", and "Help". The main area contains a table with the following columns: "Num", "Time Stamp", "Sensor Type & Number", and "Log Ar". The table lists 12 entries, with the first entry being "Event Logging Disabled #09" and the others being "System Event #83".

Num	Time Stamp	Sensor Type & Number	Log Ar
1	02/05/2004 - 13:25:17	Event Logging Disabled #09	Log Ar
2	02/05/2004 - 14:49:42	System Event #83	Starti
3	02/05/2004 - 14:49:42	System Event #83	Timest
4	02/05/2004 - 14:49:45	System Event #83	Timest
5	02/05/2004 - 16:07:50	System Event #83	Starti
6	02/05/2004 - 16:07:50	System Event #83	Timest
7	02/05/2004 - 16:07:50	System Event #83	Timest
8	02/05/2004 - 16:26:20	System Event #83	Starti
9	02/05/2004 - 16:26:20	System Event #83	Timest
10	02/05/2004 - 16:26:21	System Event #83	Timest
11	02/06/2004 - 10:40:23	System Event #83	Starti
12	02/06/2004 - 10:40:23	System Event #83	Timest

SEL data

The following table presents information on the data provided by the SEL Viewer Utility.

Table 33. SEL information

Sensor Type	Sensor Number	Sensor Name	User Action
01		Temperature	
	31h	BSE Temperature	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace the Blade Storage Expansion option.
	98h	Processor 1 Temperature	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace Processor 1.
	99h	Processor 2 Temperature	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace Processor 2.
	9Ah	Processor 3 Temperature	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace Processor 3.
	9Bh	Processor 4 Temperature	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace Processor 4.
	C0h	Processor 1 Hot	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace Processor 1.

Table 33. SEL information

Sensor Type	Sensor Number	Sensor Name	User Action
	C1h	Processor 2 Hot	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace Processor 2.
	C2h	Processor 3 Hot	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace Processor 3.
	C3h	Processor 4 Hot	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace Processor 4.
02		Voltage	
	10h	I/O Board +1.5 V Standby	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.
	11h	I/O Board +1.8 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.
	12h	I/O Board +2.5 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.
	13h	I/O Board +2.5 V Standby	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.

Table 33. SEL information

Sensor Type	Sensor Number	Sensor Name	User Action
	14h	I/O Board +3.3 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.
	15h	I/O Board +3.3 V Standby	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.
	16h	I/O Board +5 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.
	17h	I/O Board -5 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.
	18h	I/O Board +12 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.
	19h	I/O Board +12 V Standby	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.
	1Ah	Processor Board +1.25 V VTT	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace CPU board.
	1Bh	Processor Board +1.5 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace CPU board.

Table 33. SEL information

Sensor Type	Sensor Number	Sensor Name	User Action
	1Ch	Processor Board +2.5 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace CPU board.
	1Dh	Processor Core	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace CPU board.
	1Eh	Processor Board +12 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace CPU board.
	20h	Processor Board VR Fault	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace CPU board.
	21h	I/O Board VR Fault	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.
	22h	Processor VR Over Voltage Fault	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace CPU board.
	23h	RTC Battery	<ol style="list-style-type: none"> 1. Replace battery.
	24h	BSE +1.8 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
	25h	BSE +2.5 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.

Table 33. SEL information

Sensor Type	Sensor Number	Sensor Name	User Action
	26h	BSE +3.3 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
	27h	BSE +5 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
	28h	BSE +12 V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
	29h	BSE +18V	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
	2Ah	BSE VRM Fault	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
03		Current	
	2Dh	Processor Board 12 V Over Current Fault	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace CPU board.
	2Eh	I/O Board 12 V Over Current Fault	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace I/O board.
	2Fh	BSE Over Current Fault	<ol style="list-style-type: none"> 1. Check server chassis power (see the server chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.

Table 33. SEL information

Sensor Type	Sensor Number	Sensor Name	User Action
07		Processor	
	8Bh	Processor Mismatch	Verify that the processors are all of the same cache size and type, and they all operate at the same clock speed (internal and external clock frequencies must be identical).
	90h	Processor 1 Status	Verify that the processor indicated by the lit LED is installed correctly. If the problem continues, replace Processor 1.
	91h	Processor 2 Status	Verify that the processor indicated by the lit LED is installed correctly. If the problem continues, replace Processor 2.
	92h	Processor 3 Status	Verify that the processor indicated by the lit LED is installed correctly. If the problem continues, replace Processor 3.
	93h	Processor 4 Status	Verify that the processor indicated by the lit LED is installed correctly. If the problem continues, replace Processor 4.
09		Power Unit	
	01h	Power Unit Status	<ol style="list-style-type: none"> 1. A/C lost. 2. Soft power control failure. 3. Power unit failure detected.
0D		Drive Slot	
	87h	BSE Drive 1 Present	<ol style="list-style-type: none"> 1. Remove the first drive not recognized and try the hard disk drive diagnostic test again. 2. If the remaining drives are recognized, replace the drive you removed with a new one.
	88h	BSE Drive 2 Present	<ol style="list-style-type: none"> 1. Remove the first drive not recognized and try the hard disk drive diagnostic test again. 2. If the remaining drives are recognized, replace the drive you removed with a new one.
	89h	BSE Drive 1 Fault	<ol style="list-style-type: none"> 1. Remove and reseal drive 1 and try the hard disk drive diagnostic test again. 2. If drive continues to fail, replace the drive.

Table 33. SEL information

Sensor Type	Sensor Number	Sensor Name	User Action
	9Ah	BSE Drive 2 Fault	<ol style="list-style-type: none"> 1. Remove and reseal drive 2 and try the hard disk drive diagnostic test again. 2. If drive continues to fail, replace the drive.
0F		System Firmware Progress	
	06h	POST error	<ol style="list-style-type: none"> 1. Review error log for POST code. 2. Check POST code against BIOS/BMC POST code error list.
10		Event Logging	
	09h	Disabled Event Logging	Reset/Clear log area.
12		System Event	
	0Ah	System Event	System reconfiguration has occurred.
13		Critical Interrupt	
	07h	NMI Interrupt	A fatal system hardware error condition has occurred. Review the SEL entries for additional information.
15		Module/Board	
	83h	I/O Expansion Card 1 Present	<ol style="list-style-type: none"> 1. Check/Verify that the I/O expansion card 1 is physically present. 2. Replace I/O expansion card.
	84h	I/O Expansion Card 2 Present	<ol style="list-style-type: none"> 1. Check/Verify that the I/O expansion card 2 is physically present. 2. Replace I/O expansion card.
	85h	BSE Present	
1B		Cable/Interconnect	
	86h	Mezzanine Board Cable	<ol style="list-style-type: none"> 1. Inspect interconnecting cables for physical damage. 2. Replace cables.

Table 33. SEL information

Sensor Type	Sensor Number	Sensor Name	User Action
21		Memory Slot Connector	
	E0h	DIMM 1	Replace DIMM 1.
	E1h	DIMM 2	Replace DIMM 2.
	E2h	DIMM 3	Replace DIMM 3.
	E3h	DIMM 4	Replace DIMM 4.
	E4h	DIMM 5	Replace DIMM 5.
	E5h	DIMM 6	Replace DIMM 6.
	E6h	DIMM 7	Replace DIMM 7.
	E7h	DIMM 8	Replace DIMM 8.
23		Watchdog	
	03h	BMC Watchdog 2 Timer	<ol style="list-style-type: none"> 1. Timer expired, status only. 2. Hard Reset Power Down Power Cycle Timer Interrupt
F3h		SMI Timeout	
	82h	SMI Timeout	<ol style="list-style-type: none"> 1. Check BIOS for corruption or re-flash BIOS. 2. Replace I/O board. 3. Replace CPU board.
NA		Management Subsystem Health	
	0Ch	BMC Self Test	<ol style="list-style-type: none"> 1. Try to re-flash the BMC firmware. 2. Replace I/O board.

Management Module error codes

These codes are viewed in the system chassis management module log.

SCSI error codes

Error code	FRU/Action
<p>All SCSI Errors One or more of the following might be causing the problem:</p> <ul style="list-style-type: none"> • A failing SCSI device (adapter, drive) • An improper SCSI configuration • Duplicate SCSI IDs in the same SCSI chain 	<ol style="list-style-type: none"> 1. Verify that the SCSI devices are configured correctly.

Temperature error messages

– NOTE	
See “System” on page 130 to determine which components should be replaced by a field service technician.	
Message	Action
System over temperature for CPU x.	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing Options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace microprocessor x.
Blade Storage Expansion option over recommended temperature.	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing Options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace the SCSI hard disk drives. 3. Replace the Blade Storage Expansion option.
CPU x over temperature.	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing Options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace microprocessor x.

Power error messages

– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.	
Message	Action
BSE +12V over recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +12V under recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +5V over recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +5V under recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +18V over recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +18V under recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +3.3V over recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +3.3V under recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +2.5V over recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.

– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.	
Message	Action
BSE +2.5V under recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +1.8V over recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
BSE +1.8V under recommended voltage	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade storage expansion option. 3. Replace blade storage expansion option.
System Power Good fault	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
VRM Power Good fault	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
System over recommended voltage for +12v.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
System over recommended voltage for +1.25v.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
System over recommended voltage for +1.5v.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
System over recommended voltage for +2.5v.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
System over recommended voltage for +3.3v.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.

– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.	
Message	Action
System over recommended 5V fault.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
VRM voltage over recommended tolerance.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
System under recommended voltage for +12v.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
System under recommended voltage for +1.25v.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
System under recommended voltage for +1.5v.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
System under recommended voltage for +2.5v.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
System under recommended voltage for +3.3v.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.
System under recommended 5V fault.	<ol style="list-style-type: none"> 1. Check system chassis power (see the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>). 2. Reseat blade server. 3. Replace blade server.

System shutdown

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

System errors

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
Message	Action
Internal Error CPU x fault	<ol style="list-style-type: none"> 1. Reseat I/O Expansion Option. 2. Reseat Blade Storage Expansion option. 3. Reseat IDE hard drive; then, restart the blade server and watch for the following results: <ol style="list-style-type: none"> a. If a PCI device on the blade server has failed, replace PCI device. b. If all PCI devices are functional, continue with step 4 4. Replace microprocessor x. 5. Replace I/O Expansion Option. 6. Replace Blade Storage Expansion option. 7. Replace IDE hard drive. 8. Replace CPU board.

Temperature related system shutdown

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
Message	Action
System shutoff due to CPU x over temperature	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing Options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace microprocessor x.
System shutoff due to Blade Storage Expansion option temperature	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing Options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace Blade Storage Expansion option.
CPU x shut off due to over temperature	<ol style="list-style-type: none"> 1. Ensure that the system is being properly cooled; see "System reliability considerations" under "Installing Options" in the <i>Intel® Server Compute Blade SBX44: Installation and User's Guide</i>. 2. Replace microprocessor x.
Critical Blower Failure, blade server powering down	<ol style="list-style-type: none"> 1. See the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i>.

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
Message	Action
Power Modules are over temperature, blade server powering down	1. See the system chassis <i>Hardware Maintenance Manual and Troubleshooting Guide</i> .

DASD checkout

<p>– NOTE See “System” on page 130 to determine which components should be replaced by a field service technician.</p>	
Message	Action
Hard drive x removal detected (level-critical; hard drive x has been removed)	1. Information only, take action as appropriate.

Fault Resilient Booting (FRB)

FRB3 - BSP Reset failures

The Server Compute Blade SBX44 provides a feature that guarantees that the system boots, even if one or more processors fail during POST. The BMC contains timers that can be configured to reset the system upon timeout. The first timer (FRB-3) starts counting down whenever the system comes out of hard reset. If the bootstrap processor (BSP) successfully resets and begins executing, the BIOS disables the FRB-3 timer in the BMC and the system continues executing POST. If the timer expires because of the BSP’s failure to fetch or execute BIOS code, the BMC resets the system and disables the failed processor. The BMC continues to change the BSP until the BIOS successfully disables the FRB-3 timer. The BMC sounds beep codes on the system speaker if it fails to find a good processor. It will continue to cycle until it finds a good processor. The process of cycling through all the processors is repeated upon system reset or power cycle.

FRB2 - BSP POST failures

The second timer (FRB-2) is set to several minutes by BIOS and is designed to guarantee that the system completes POST. The FRB-2 timer is enabled just before the FRB-3 timer is disabled to prevent any "unprotected" window of time. Near the end of POST, the BIOS disables the FRB-2 timer. If the system contains more than 1 GB of memory and the user chooses to test every DWORD of memory, the watchdog timer is extended before the extended memory test starts, because the memory test can exceed the timer duration. The BIOS will also disable the watchdog timer before prompting the user for a boot password. If the system hangs during POST, before the BIOS disables the FRB-2 timer, the BMC generates an asynchronous system reset (ASR). The BMC retains status bits that can be read by the BIOS later in the POST process for the purpose of disabling the

previously failing processor, logging the appropriate event into the SEL, and displaying an appropriate error message to the user.

Options are provided by the BIOS to control the policy applied to FRB-2 failures. By default, an FRB-2 failure results in the failing processor being disabled during the next reboot. This policy can be overridden to prevent the BSP from ever being disabled due to the FRB-2 failure or a policy can be selected to disable the BSP after three consecutive FRB-2 failures. These options may be useful in systems that experience fatal errors during POST that are not indicative of a bad processor. Selection of this policy should be considered an advanced feature and should only be modified by a qualified system administrator. If supported by the specific platform, these options can be found in BIOS Setup.

FRB1 - BSP Self-test failures

In addition to the FRB3 and FRB2 timers, the BIOS provides an FRB1 timer. Early in POST, the BIOS checks the Built-in Self Test (BIST) results of the BSP. If the BSP fails BIST, the BIOS requests the BMC to disable the BSP. The BMC disables the BSP, selects a new BSP and generates a system reset. If there is no alternate processor available, the BMC beeps the system speaker and halts the system.

The BIST failure is indicated to the user by displaying an error message during POST and logging an error (8010) message to the SEL.

OS Boot Timer - OS load failures

The BIOS provides another watchdog timer to provide Fault Resilient Booting to the operating system. The BIOS will enable the watchdog timer in the BMC with the number of minutes that are set in BIOS Setup. This option is disabled by default. It is the responsibility of the operating system or an application to disable this timer once it has successfully loaded.

— NOTE

Enabling this option without having an operating system or server management application installed that supports this feature will cause the system to reboot when the timer expires. Consult your application or operating system vendor to see if this feature is supported.

Application Processor (AP) failures

The BIOS and BMC implement additional safeguards to detect and disable the application processors (APs) in a multi-processor system. If an AP fails to complete initialization within a certain time, it is assumed to be non-functional. If the BIOS detects that an AP has failed BIST or is non-functional, it requests the BMC to disable that processor. Processors disabled by the BMC are not available for use by the BIOS or the operating system.

Treatment of failed processors

All the failures (FRB3, FRB2, FRB1 and AP failures) including the failing processor are recorded in the SEL. The FRB3 failure is recorded automatically by the BMC while the FRB2, FRB1, and AP failures are logged to the SEL by the BIOS. In the case of an FRB2 failure, some systems will log additional information into the OEM data byte fields of the SEL entry. This additional data indicates the last POST task that was executed before the FRB2 timer expired. This information may be useful for failure analysis.

The BMC maintains failure history for each processor in non-volatile storage. This history is used to store a processor's track record. Once a processor is marked "failed", it remains "failed" until the user forces the system to retest the processor by entering BIOS Setup and selecting the "rescan processors" option. The BIOS reminds the user about a previous processor failure during each boot cycle until all processors have been retested and successfully pass the FRB tests or AP initialization. If all the processors are bad, the system does not alter the BSP and attempts to boot from the original BSP. Error messages are displayed on the console, and errors are logged in the event log of a processor failure.

If the user replaces a processor that has been marked bad by the system, the system must be informed about this change by running BIOS Setup and selecting that processor to be retested. If a bad processor is removed from the system and is replaced with a terminator module, the BMC automatically detects this condition and clears the status flag for that processor during the next boot.

There are three possible states for each processor slot:

1. Processor installed - Status only, indicates processor has passed BIOS POST.
2. Processor failed - The processor may have failed FRB2, FRB3, or BIST and has been disabled.
3. Processor not installed - Status only, indicates the processor slot has no processor in it.

BIOS Memory POST testing and disabling of DIMMs

The Intel® Server Compute Blade SBX44 BIOS performs various POST tests during startup. One such test is the Memory POST test that checks all DIMMs populated in the system for:

- Mismatched memory and invalid memory configurations
- Reliability of the DIMMs

Additionally, the BIOS provides the capability to enable Hot Spare memory and ECC memory initialization.

Mismatched or invalid memory configuration

The Intel® Server Compute Blade SBX44 has eight DIMM slots. It is required that these DIMM slots are populated in pairs with the same technology DIMMs (same manufacturer, CAS latency, timing parameters, and same number of rows, columns and devices, etc.). During memory enumeration, the BIOS reads the SPD information of the DIMMs to check for the following:

- DIMMs pairs are of the same technology.
- DIMM configuration is correctly populated in pairs.
- At least one DIMM pair is installed in the system.

If any of the above conditions are not satisfied, the following occurs:

- POST generates an error message of "289 - DIMM D? and D? - Non Matching or Missing DIMMS". The "?" specifies the DIMM number in error.
- The error is logged to the management module error log.
- The Light Path Diagnostics* LEDs for the corresponding DIMMs and front panel fault LED are turned on.

- The DIMM error message is logged to the SEL.

Reliability of the DIMMs

The BIOS checks the reliability of the DIMMs populated in the system by performing a data pattern test. During this test, predefined data patterns are written to various locations in the DIMMs and then the data is read back. This simple memory read-write test is performed one DIMM pair at a time. Thus, the BIOS enables memory enumeration only one DIMM pair at a time and tests all four DIMM pairs one at a time. If the test fails BIOS during testing, the failing DIMM pair is flagged as disabled.

Errors resulting from reliability testing are indicated as follows:

- The BIOS reports an error message of "289 - DIMM D? and D? disabled" to the management module and the BMC.
- The BMC turns on the Light Path Diagnostics LEDs for the corresponding DIMMs and front panel fault LED. The ? indicates the DIMM number.
- The BMC logs the error message to the SEL.
- If the system has at least one other good pair of DIMMs, the boot process will continue.
- The BIOS Setup will show the DIMM numbers of "Disabled" DIMMs within BIOS Setup.

The reliability test is performed on all banks for each system boot.

Runtime memory error handling

The Intel® Server Compute Blade SBX44 BIOS provides a mechanism to disable memory DIMMs if errors are detected during runtime. DIMMs are only disabled if double-bit or multi-bit errors occur.

When double-bit or multi-bit errors occur during runtime, the following happens:

1. An NMI is generated to reset for the error.
2. The management module logs the disabled DIMMs as "289 - DIMM D? and D? disabled."
3. A disabled error message is sent to the SEL.
4. The failing DIMMs are marked as "Disabled," but the DIMMs are actually disabled only during the next reboot.
5. During the next reboot, the BIOS displays the message "DIMM D? and D? disabled" during POST and memory is resized based on reading the recorded state of the DIMMs and skipping the sizing of disabled DIMMs that occurred during runtime.
6. The BIOS Setup screen shows the DIMMs as disabled.

A setup option is provided in the BIOS that allows you to retest the DIMMs that were disabled during runtime. This setup option, "Retest Disabled DIMMs," is dynamically turned to "Disabled" after the POST and initial memory reliability testing. If no failure occurs during re-test, the DIMMs are re-enabled and the system is booted using these DIMMs.

The value of this switch does not indicate whether the actual DIMMs are enabled or disabled. This is indicated in setup as the "Disabled DIMM Number" string. You need to "Enable" this option in BIOS Setup:

- Prior to retesting the DIMMs one more time

- When the "Disabled" DIMMs are replaced.

Hot Spare memory feature

The Intel® Server Compute Blade SBX44 supports the Hot Spare memory feature. The Hot Spare memory feature allows you to reserve one DIMM pair in the system memory as a spare row. When single-bit ECC errors in a non-spare DIMM pair exceed a pre-defined threshold value, the system BIOS swaps the row (i.e., copies the data from rows where errors occurred to a spare row). After the copy is complete, the row with the error is no longer used and is marked as "Disabled". During the next reboot the memory DIMM pair with the error is not used during memory detection and is disabled. A BIOS POST message is displayed: "DIMM D? and D? disabled". The management module reports when Hot Spare memory copying starts and when it finishes. A setup option is present in the BIOS to enable/disable the Hot Spare memory feature. This Hot Spare memory feature is disabled by default. If the system does not have identical extra DIMM pairs or has already utilized the Hot Spare feature once, the Hot Spare feature is dynamically disabled by the BIOS. A BIOS POST message is displayed during every boot to indicate whether the Hot Spare memory option is Enabled or Disabled.

ECC memory initialization

The BIOS initializes ECC memory and enables scrubbing. It also provides setup options to enable Memory ECC Error Logging. When enabled, the BIOS will log the single-bit ECC errors that exceed a predetermined threshold and multi-bit ECC errors to the SEL and management module error logs.

Undetermined problems

— NOTE

When troubleshooting a problem with the Server Compute Blade SBX44, it must be determined whether the problem is a blade server problem or a problem with the system chassis.

- If the system chassis 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 system chassis problem; for more information, see the system chassis *Hardware Maintenance Manual and Troubleshooting Guide*.

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 57).

Check the LEDs on all the power supplies of the system chassis 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 CPU 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 chassis Web interface (see the system chassis 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 512 MB DIMMs)

= NOTE

Minimum operating requirements are:

- a. CPU board
 - b. One microprocessor
 - c. Memory (with a minimum of two 512 MB DIMMs)
 - d. A functioning system chassis
6. Install and turn on the blade server. If the problem remains, suspect the following FRUs in the order listed:
 - DIMM
 - CPU board
 - Microprocessor

Notes:

1. If the problem goes away when you remove an I/O adapter from the system and replacing that I/O adapter does not correct the problem, suspect the CPU board.
2. If you suspect a networking problem and all the system tests pass, suspect a network cabling problem external to the system.

Problem determination tips

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

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

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

5 BIOS, diagnostics and firmware update procedures

This section describes the usage of system update procedures for BIOS, diagnostics and firmware upgrades. You will also find instructions on the use of additional standalone utilities.

— NOTE

Check the release notes and readme files that may come with the applicable utility before using the instructions in this manual. Check the Intel Business Link (IBL) or contact your Intel field representative for the latest updates.

Upgrading the BIOS

The BIOS is implemented as firmware that resides in flash ROMs. Use the DOS-based AFUIDOS utility to upgrade the BIOS of the Intel® Server Compute Blade SBX44.

AFUIDOS Utility command-line options

The AFUIDOS utility is initiated at a command prompt as follows:

```
AFUIDOS /M:<Machine Type/Model> /B:<Box Serial Number> /A:<Asset Tag> /E:<Unique ID> /D:<Drive:\Path\Filename> /S:<Drive:\Path\Filename> /I:<Drive:\Path\Filename> /2 /N /R
```

Running the AFUIDOS utility without any switches will launch the graphical user interface (GUI) menu. If any update fails or cannot continue (e.g., wrong system, etc.), a return code of "1" is returned which the running batch file can detect and use to take appropriate action. The command-line switches are case insensitive. See the following table for specific information on each of the switches.

Table 34. AFUIDOS utility command-line switches

Switch	Description
/M:<Machine Type/Model>	View/Update the Machine Type/Model Field (also referred to as the Intel Product Code) - If the /M: switch is used without any characters immediately following the switch, the utility will call the appropriate interrupt to read this field and the Machine Type/Model will be displayed with the message "Machine Type/Model is xxxxx." If the /M: switch is used with characters immediately following the switch, the utility will make the appropriate interrupt to set this field. The characters must immediately follow the switch and no spaces are permitted. If the setting of this field is successful, the utility will display the message "Message Type/Model has been set to xxxxx." If the setting of this field is unsuccessful for any reason (e.g., field is simply unable to be modified), the utility will return the message "Setting of the Machine Type/Model has failed."

Table 34. AFUIDOS utility command-line switches

Switch	Description
/B:<Box Serial Number>	View/Update the Box Serial Number Field - If the /B: switch is used without any characters immediately following the switch, the utility will call the appropriate interrupt to read this field and the Box Serial Number will be displayed with the message "Box Serial Number is xxxxx." If the /B: switch is used with characters immediately following the switch, the utility will make the appropriate interrupt to set this field. The characters must immediately follow the switch and no spaces are permitted. If the setting of this field is successful, the utility will display the message "Box Serial Number has been set to xxxxx." If the setting of this field is unsuccessful for any reason (e.g., number of characters are greater than maximum allowed or field is simply unable to be modified), the utility will return the message "Setting of the Box Serial Number has failed."
/A:<Asset Tag>	View/Update the Asset Tag Field - If the /A: switch is used without any characters immediately following the switch, the utility will call the appropriate interrupt to read this field and the Asset Tag will be displayed with the message "Asset Tag is xxxxx." If the /A: switch is used with characters immediately following the switch, the utility will make the appropriate interrupt to set this field. The characters must immediately follow the switch and no spaces are permitted. If the setting of this field is successful, the utility will display the message "Asset Tag has been set to xxxxx." If the setting of this field is unsuccessful for any reason (e.g., number of characters are greater than maximum allowed or field is simply unable to be modified), the utility will return the message "Setting of the Asset Tag has failed."
/E:<Unique ID>	View/Update the Unique ID Field - If the /E: switch is used without any characters immediately following the switch, the utility will call the appropriate interrupt to read this field and the Unique ID will be displayed with the message "Unique ID is xxxxx." If the /E: switch is used with characters immediately following the switch, the utility will make the appropriate interrupt to set this field. The characters must immediately follow the switch and no spaces are permitted. If the setting of this field is successful, the utility will display the message "Unique ID has been set to xxxxx." If the setting of this field is unsuccessful for any reason (e.g., number of characters are greater than maximum allowed or field is simply unable to be modified), the utility will return the message "Setting of the Unique ID has failed."
/D:<Drive:\Path\Filename>	Update Diagnostics - This switch will take the 2-MB image specified following the switch and update the Diagnostic Image in the alternate flash part. The /D switch can only be combined with the /R switch. The file information must immediately follow the switch and no spaces are permitted. If the file information is not entered correctly, the utility will return with the message "Filename information is incorrect." The utility also accepts split images with **.001 as the first filename; it will prompt for **.002 and so on until the whole 2-MB image has been read. If /D is used without a filename, the utility will use the default diags filename of "\$diag.001". The utility will make the appropriate interrupt call to switch to the alternate flash part so it appears in the addressable memory space for the update. If the update of the Diagnostic Image is successful, the utility will display the message "Update of the Diagnostic Image has succeeded." If the programming of the Diagnostic Image fails for any reason, the utility will display the message "Update of the Diagnostic Image has failed."

Table 34. AFUIDOS utility command-line switches

Switch	Description
/S:<Drive:\Path\Filename	Save Current BIOS Image - This switch will read the Current BIOS Image that the system booted from and save it to the file information specified. The /S: switch can only be combined with the /R switch. The file information must immediately follow the switch and no spaces are permitted. If the file information is not entered correctly, the utility will return with the message "Filename information is incorrect." The utility will make the appropriate interrupt call to determine which BIOS image, primary or secondary, has booted so the utility can determine which part of the flash part needs to be read. If the saving of the Current BIOS Image is successful, the utility will display the message "Save of the Current BIOS Image has succeeded." If the saving of the Current BIOS Image fails for any reason, the utility will display the message "Save of the Current BIOS Image has failed."
/I:<Drive:\Path\Filename>	File Primary BIOS Image - This switch will flash the Primary BIOS image from the file information. The /I: switch can only be combined with the /R switch. The utility also accepts split images with *.001 as the first filename; it will prompt for *.002 and so on until the whole 2-MB image has been read. The utility will determine through an interrupt whether the primary or secondary BIOS image has booted the system. If the Primary BIOS has booted, the top part will be flashed; if the Secondary BIOS has booted, then the bottom part will be flashed. The file information must immediately follow the switch and no spaces are permitted. If the file information is not entered correctly, the utility will return the message "Filename information is incorrect." If the writing of the BIOS Image is successful, the utility will display the message "Flash update succeeded." If the writing of the BIOS Image fails for any reason, the utility will display the message "Flash update failed."
/2	Backup Primary BIOS - This switch will copy the 2-MB Primary BIOS image in the flash part to the 2-MB Secondary BIOS image in the other section of the flash part. The /2 switch can only be used with the /R switch. The utility will determine via an interrupt whether the primary or secondary BIOS image has booted the system. If the Primary BIOS has booted then the top part of the flash will be copied into the bottom half. If the Secondary BIOS has booted then the error message "Secondary BIOS booted, backup of Primary BIOS halted" is returned. If the update of the Primary BIOS image is successful, the utility will return the message "Backup of the Primary BIOS has succeeded." If the backup of the Primary BIOS image is unsuccessful, the utility will return the message "Backup of the Primary BIOS has failed."
/N	Update VPD field only - This switch only updates the VPD fields instead of the entire BIOS image. It will process all /M: /B:, /A: and /E: switches and ignore all other switches that would flash the BIOS in some way, such as the /I:, /D: and /2: switches.
/R	Reboot System - This switch resets the system after the utility is executed. The /R switch can be used with all available switches.

To update the BIOS

To upgrade the BIOS of your blade server:

1. Download the appropriate BIOS package for your Intel® Server Compute Blade SBX44. (Contact your Intel customer representative for more information.)
2. Boot the system to ROM DOS.
3. Run the AFUIDOS utility from a USB key device, hard disk or CD with required command-line options to flash the BIOS as follows:

```
AFUIDOS /I:filename
```

where:

filename is the name of the SBXxxxxx.rom file (2-MB image) or SBXxxxxx.001 (1-MB image)

The system will automatically request for the second 1-MB file (i.e., SBXxxxxx.002).

4. Reboot the system.

To update the Diagnostics

1. Download the appropriate BIOS package for your Intel® Server Compute Blade SBX44. (Contact your Intel customer representative for more information.)
2. Boot the system to ROM DOS.
3. Run the AFUIDOS utility from a USB key device, hard disk or CD with required command-line options as follows:

```
AFUIDOS /d:<Drive:\path\filename.001>
```

where:

filename.001 is the filename of the first split image and .002 is the second part of the image. If no filename is specified, then the default file of \$DIAG.001 is used. These are two 1-MB images that fit on a floppy diskette.

4. Reboot the system.

To update both the Primary and Secondary BIOS images

1. Download the appropriate BIOS package for your Intel® Server Compute Blade SBX44. (Contact your Intel customer representative for more information.)
2. Boot the system to ROM DOS.
3. Run the AFUIDOS utility from a USB key device, hard disk or CD with required command-line options as follows:

```
AFUIDOS /I:filename
```

where:

filename is the name of the SBXxxxxx.rom file (2-MB image) or SBXxxxxx.001 (1-MB image)

The system will automatically request for the second 1-MB file (i.e., SBXxxxxx.002).

4. Reboot the system to ROM DOS.
5. Run the following command to make the primary and secondary BIOS images identical:

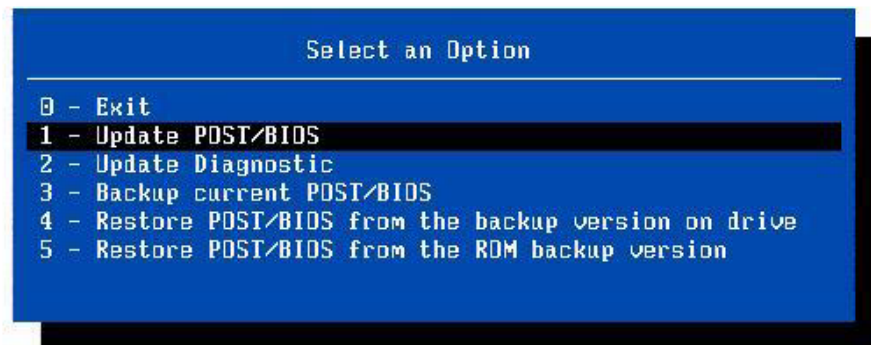
```
AFUIDOS /2
```

To run AFUIDOS in interactive mode

1. Download the appropriate BIOS package for your Intel® Server Compute Blade SBX44. (Contact your Intel customer representative for more information.)
2. Boot the system to ROM DOS.
3. Run the Menu.exe utility at a command prompt from a USB key device, hard disk or CD:

```
c:\...\Menu
```

The "Select an Option" window will display on the monitor (see the following figure).



[To select <ENTER>] [Move <UP/DOWN ARROW>] [Help <F1>]

— NOTE

Menu.exe must be in the same directory as the xxxxxx.rom file in order for the update to work properly. If the file is not in the same directory, the execution will fail with a Cannot update System error message.

4. Select the "Update POST/BIOS" option.
5. Type in the name of the xxxxxx.rom file when prompted to "Enter file name." The xxxxxx.rom file is the BIOS ROM file that will be used in the update (for example, sbx44001.rom).

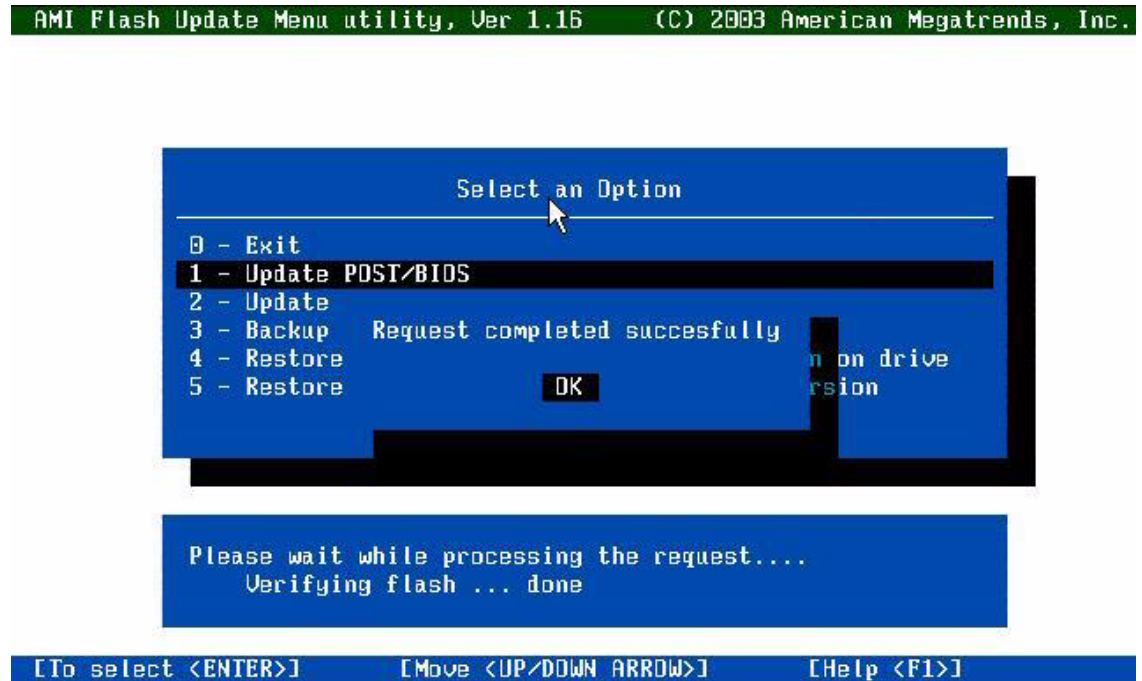
The screenshot shows a blue terminal window with the text "Enter file name:sbx44001.rom".

6. The next several screens will display options for entering information to your system. Filling out these fields is optional.
 - Would you like to backup Primary BIOS within the flash ROM?
 - Enter the Serial Number:
 - Enter the Machine Type/Model:
 - The current Asset Tag in your machine is: []
 - Would you like to update the Asset Tag?
7. You will be prompted with the option of saving the Flash code to a specified file:
Save the Flash Code?

8. Enter "Yes" to update the BIOS when prompted by the following message:

Update POST/BIOS?

Once you select "Yes" for updating the BIOS, the process will display a message to wait while the utility erases the flash, writes the flash, and verifies the flash.



9. Upon completion of the update, the following message screen will appear. Select "Yes" to reboot.



Upgrading the firmware

The FWPIAUPD utility is used to upgrade the firmware of the Baseboard Management Controller (BMC) for the Intel® Server Compute Blade SBX44. This utility is a DOS-based application that updates the boot block, operational code and Product Information Area (PIA) of the BMC.

Download the appropriate firmware package for your Intel® Server Compute Blade SBX44 system. (Contact your Intel customer representative for more information.)

FWPIAUPD command-line arguments

The basic command line format is as follows:

```
FWPIAUPD [-?|-h] [-ni] [-u|-v] [-b] [-o] [-pia] [-p|-s] [-nodownrev] [-i[-address=XX]] [-errlog=file] [hexfile]
```

— NOTE

A "/" may be used in place of the "-".

— Important

- It is important to remember to reboot the system after updating the micro-controller operational code or the boot block. If the system is not rebooted, behavior is undeterminable. Use of incorrect firmware code or combinations of code may cause the system to behave erratically or lock up.

Table 35. FWPIAUPD command-line arguments

Parameter	Description
FWPIAUPD	The name of the utility.
<hexfile>	The name of the hex file for the operation. The path can be specified with the filename, e.g., c:\mydir\updatfil.hex. There is no default filename or extension.
/? or /help	Displays the command-line help.
/ni	Forces non-interactive mode. If the specified operation requires user input or if the operation is not specified completely, the utility will exit with an error.
/nodownrev	Prevents the utility from uploading a lower revision of firmware than what is already present on the system.
/upload	Uploads and verifies the firmware.
/verify	Verifies the firmware.
/boot	Applies the specified operation to the boot area. The operational area and PIA (if present in the file) are also updated/verified.
/op	Applies the specified operation to the operational area. The PIA area (if present in the file) is also updated/verified.
/pia	Applies the specified operation to the PIA area only. This will only effect the BMC at address 20.
/primary	Selects the primary controller to update/verify with the specified file.
/secondary	Selects the secondary controller to update/verify with the specified file.

Table 35. FWPIAUPD command-line arguments

Parameter	Description
/inventory	Shows the firmware versions from the specified hex file. If no hex file is specified in the -address option then the default address of 20 is used. Shows the BMC, firmware, and PIA versions from a file. Shows the BMC and firmware versions from the controller.
/address=XX	Specifies the optional address to use for the inventory command. The address is specified in hexadecimal. The default address is 20.
/errlog=file	Sets the file for which the error stack should be written to in the event that an error occurs. If no errors occur, "successful termination" is written to the file. The command will overwrite an existing file. This file is useful for troubleshooting any problems that may occur.

Interactive mode (default)

Interactive mode is invoked by default on the FWPIAUPD utility. If the `-ni` command is specified, the utility runs in non-interactive mode. In interactive mode, the utility will prompt for any information that is necessary to complete the operation. If a file is not specified, the utility will prompt for the file to use. If the action is not specified, the utility will prompt for the action to perform: upload or verify. If the area is not specified, the utility will prompt for which specific area(s) to act on: boot, op or pia. Finally, the utility will prompt for primary or secondary controller if both are present in the file and the system.

This prompted information is dependent on the platform and input file, and may include:

- Input filename
- Upload or verify operation
- Boot, op and/or pia area(s)
- Primary or secondary controller

A sequence of prompts could look similar to the following:

```
Enter a filename to use: sample hex
Do you want to upload or verify? [U, V, ESC]
Do you want to upload the Boot Block? [Y, N, ESC]
Do you want to upload the Op Code? [Y, N, ESC]
```

Non-interactive mode (-ni)

Non-interactive mode is invoked when the `-ni` switch is specified on the command line for the FWPIAUPD utility. In non-interactive mode, the utility requires that the action is specified, the area(s) to update is (are) specified, the primary or secondary controller is specified and the file is specified. If any of this information is missing from the command-line, the utility will exit with an error. The utility makes no assumptions about the desired operation and areas to update. All information must be specified following the command-line interface parameters listed in Table 35 on page 112.

An example invocation of non-interactive mode is as follows:

```
FWPIAUPD -ni -u -b -p sample.hex
```

The previous example would update the boot, op and pia areas, if present in the file, onto the primary controller from the sample.hex file.

To update the firmware of the BMC

Download the appropriate firmware package for your Intel® Server Compute Blade SBX44 system. (Contact your Intel customer representative for more information.)

The following command updates the operational and PIA code:

```
FWPIAUPD -ni -u -o -p filename.hex
```

The following command updates the boot block, operational and PIA code:

```
FWPIAUPD -ni -u -b -p filename.hex
```

Updating and displaying the SDRs and FRU

The FRU/SDR utility is used to perform the following functions:

- Update the Sensor Data Records (SDRs) associated with the BMC.
- Display the asset inventory information (part number, serial number) of the major field replaceable units.
- Display system and board information from the SMBIOS record.

FRUSDR utility command-line options

The command-line format to invoke the FRUSDR utility is as follows:

```
FRUSDR [/?] [/h] [/p] [/d {smb, fru, sdr}] [/Cfg filename.cfg]
```

where:

<code>/? or /h</code>	Displays usage information.
<code>/d {smb, fru, sdr}</code>	Only displays requested area.
<code>/Cfg filename.cfg</code>	Uses custom CFG file
<code>/p</code>	Pauses between blocks of data.

= NOTE

An "-" may be used in place of the "/".

To update the SDRs

At the command line, type in the following:

```
FRUSDR /Cfg filename.cfg
```

The configuration file includes the command to update the SDR file. An example output display is as follows:

```
FRU & SDR Load Utility Version 5.5
```

```
Loading Configuration File: MASTER.CFG
```

```
Copyright© 2003 Intel Corporation
```

```
.....
```

```
Preparing to Load SDR
```

```
Clearing SDR Repository...
```

```
Writing SDR Record #96
```

```
Reading SDR Repository.....
```

```
SDR file was successfully written!
```

```
Programming complete, reboot server for normal operation
```

To display the FRU

At the command line, type in the following:

```
FRUSDR /d fru [NVS type] [device id] [dev ctrl] [lun] [bus] [addr]
```

There are two basic ways of addressing most FRU devices: Direct Addressing and Indirect Addressing. When using Direct Addressing, the Controller, LUN, bus and slave addresses must be supplied after the NVS type. When using Indirect Addressing, only the Device ID is necessary after the NVS type.

The following example uses Direct Addressing, along with the Device Controller and LUN addresses, to display the BMC FRU:

```
FRUSDR /d fru IMBDEVICE C20 L00 FF 20
```

This next example uses Indirect Addressing with the Device ID to display the BMC FRU:

```
FRUSDR /d fru IMBDEVICE 00
```

The `/d fru` command may be followed with optional addresses that may be used to view different FRU areas instead of the default display of the BMC FRU. The arguments following the `/d fru` are in the same order and value range as in the FRU file header, namely: NVS_TYPE, DEVICE_ID, DEV_CNTR, NVS_LUN, DEV_BUS, and DEV_ADDRESS. The NVS LUN address and Device Controller addresses are optional. If the LUN address is used, it must start with an "L". Only LUN addresses of 0, 1, 2, and 3 are allowed. If the Device Controller address is used, it must start with a "C".

The following is an example output display of FRU information:

FRU & SDR Load Utility Version 5.5

FRU IMBDEVICE on bus FFh, Device ID 00h, IPMB address 20h, LUN 00

Reading FRU bytes 0 - 7
Reading FRU bytes 0 - 7
Reading FRU bytes 8 - F
Reading FRU bytes 10 - 17
Reading FRU bytes 18 - 1F
Reading FRU bytes 20 - 27
Reading FRU bytes 28 - 2F

Display Header Area

Common Header Area (Version 1, Length 8)

Internal Area Offset = 00h
Chassis Area Offset = 00h
Board Area Offset = 01h
Product Area Offset = 00h
MultiRecord Offset = 00h
Pad = 00h
Checksum = FEh

Display Internal Use Area

Internal Use Information Area not present in this FRU device

Display Chassis Area

Chassis Information Area not present in this FRU device

Display Board Area

Board Information Area (Version 1, Length 40)

Unicode Country Base = 00h
Manufacturing Time (mins) = 2103840
Manufacturer Name (ASCII) = Intel
Product Name (ASCII) =
Serial Number (ASCII) =
Part Number (ASCII) = 90P0976
Mfr FRU File ID (ASCII) =
Additional Field (ASCII) =

END OF FIELDS CODE

Display Product Area

Product Information Area not present in this FRU device

Display MultiRecord Area

To display system and board SMBIOS information

At the command line, type in the following:

```
FRUSDR /d smb
```

The following is an example output display of system and board SMBIOS information:

```
FRU & SDR Load Utility Version 5.5
```

```
Displayaing SM BIOS Area...
```

```
System Information (Type 1, 25 bytes)
```

```
Manufacturer      = Intel
Product Name      =
Version Number    =
Serial Number     =
```

```
Board Information (Type 2, 15 bytes)
```

```
Manufacturer      = Intel
Product Name      =
Version Number    =
Serial Number     =
```

```
Chassis Information (Type 3, 0 bytes)
```

```
Manufacturer      =
Type              =
Version Number    =
Serial Number     =
Asset Tag         =
```

To display SDRs

At the command line, type in the following:

```
FRUSDR /d sdr
```

The following is an example output display of SDR information:

```
FRU & SDR Load Utility Version 5.5
```

```
Reading SDR Repository.....
```

```
Displaying SDR area
```

```
Reading SDR Record #1
```

```
01 00 51 01 3A 20 00 10 2C 01 7F 68 02 01 04 22  ..Q.:....h..."
04 22 12 12 00 04 00 00 62 03 00 2C 10 C0 07 9A  .".....b.,....
A1 92 FF 00 00 A7 00 00 8D 00 02 02 00 00 00 CF  .....
49 2F 4F 20 42 64 20 2B 31 2E 35 56 20 53 42    I/O.Bd.+1.5V.SB
```

```

Reading SDR Record #2
02 00 51 01 37 20 00 11 2C 01 7F 68 02 01 04 22  ..Q.7.....h..."
04 22 12 12 00 04 00 00 62 03 00 2C 10 C0 07 B8  .".....b.....
C2 AF FF 00 00 C8 00 00 A9 00 02 02 00 00 00 CC  .....
49 2F 4F 20 42 64 20 2B 31 2E 38 56                I/O.Bd.+1.8V

```

```

Reading SDR Record #3
03 00 51 37 20 00 12 2C 01 7F 68 02 01 04 22  ..Q.7.....h..."
04 22 12 12 00 04 00 00 94 03 00 2C 10 C0 07 A9  .".....
B5 9E FF 00 00 BB 00 00 98 00 02 02 00 00 00 CC  .....
49 2F 4F 20 42 64 20 2B 32 2E 35 56                I/O.Bd.+2.5V

```

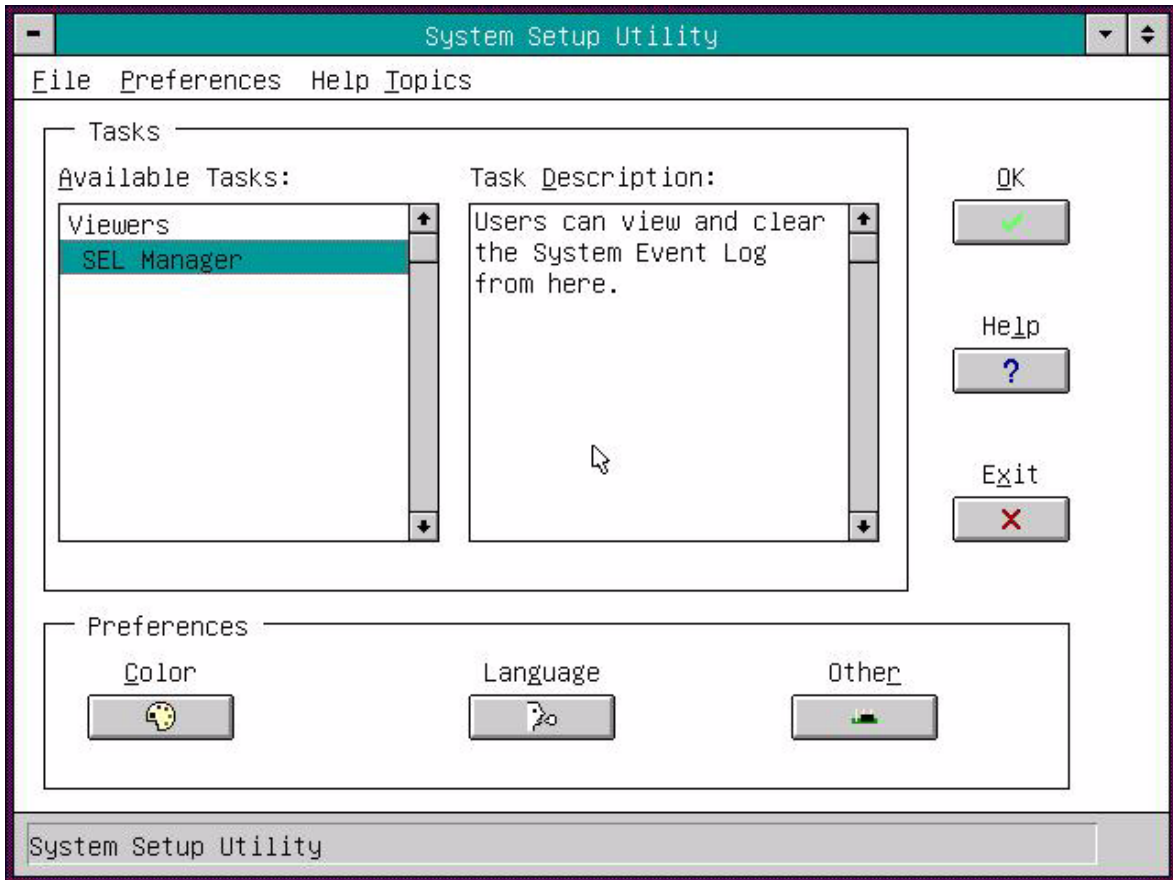
Viewing the System Event Log (SEL)

The System Setup Utility (SSU) is used to view the System Event Log (SEL) records. Running the `ssu.bat` file provided on the SSU media invokes the SSU environment by running the Application Framework (AF). If the system boots directly from the SSU media, this batch file will automatically be called. If the system boots from a different media, the SSU can be invoked manually. When started in local execution mode (the default mode), the SSU accepts user input from the keyboard and/or mouse and presents a VGA-based Graphical User Interface (GUI) on the primary monitor.

The SSU can run on writable or non-writable, removable or non-removable media. However, if the SSU media is non-writable, any user preference changes will be lost when the utility is exited. This includes any changes made to color, operating mode, language, and any other options that may be available from the various modules included with the SSU.

The SSU supports the ROM-DOS V6.22 operating system.

The SSU automatically launches the SEL Manager after initializing the main window of the AF.

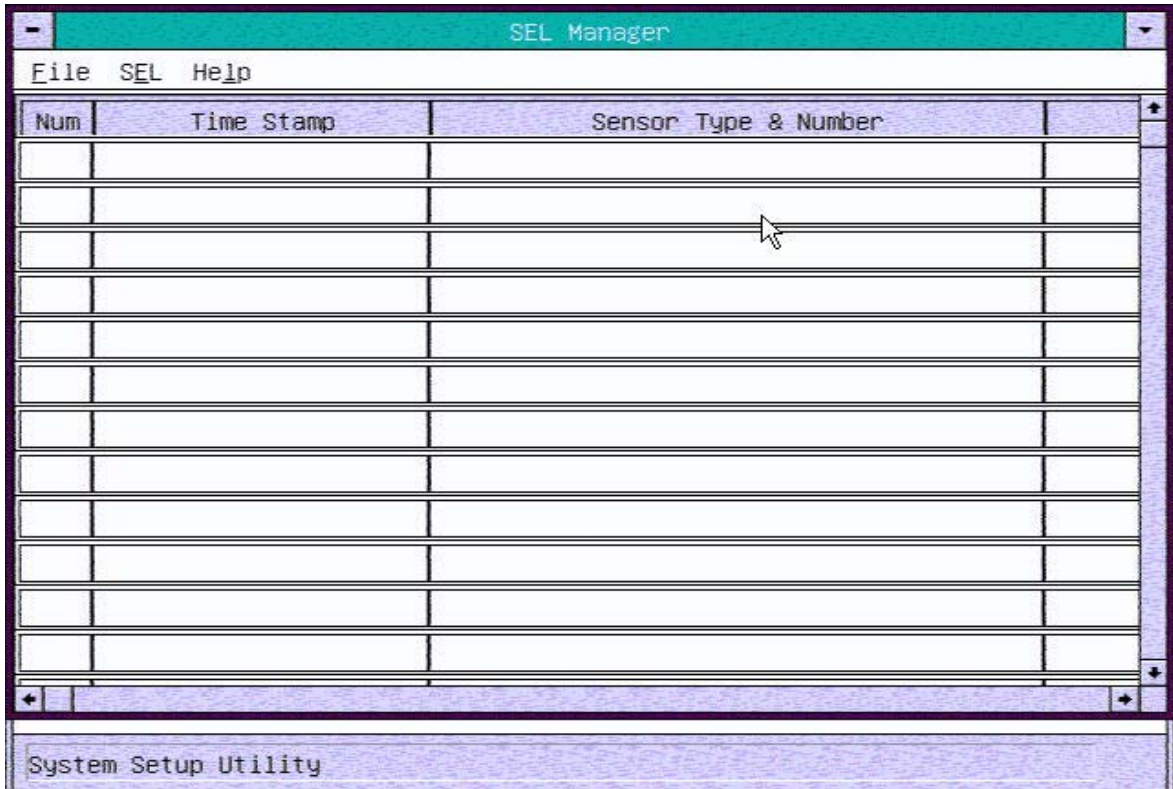


The SEL Manager Add-In provides services to view the SEL stored on the server management storage device of a server. The SEL Manager provides support to perform the following functions:

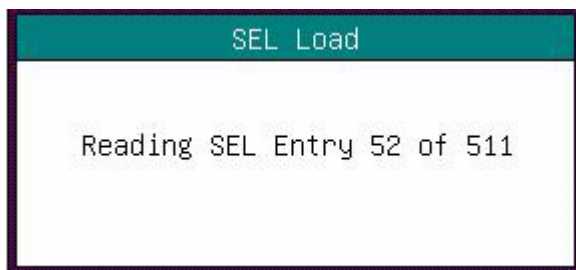
- Examine all SEL entries stored in the non-volatile storage area of the server.
- Examine SEL entries from a previously stored file.
- Save the SEL entries to a file.
- Clear the SEL entries from the non-volatile storage area.

SEL Manager main window

The main window of the SEL Manager provides access to all the features of the add-in through a series of menus. Each menu item supports an accelerator key, which is indicated by an underlined letter in VGA mode or a highlighted letter in text mode.



The SEL Manager main window is based on a multi-column format. All SEL entries are displayed in this window, one system event per row. Each column can be sorted by clicking on the column heading. The event number is tied to the particular event even if another column sorts the list. The F4 key shifts the event columns left, while the F5 key shifts the event columns right.

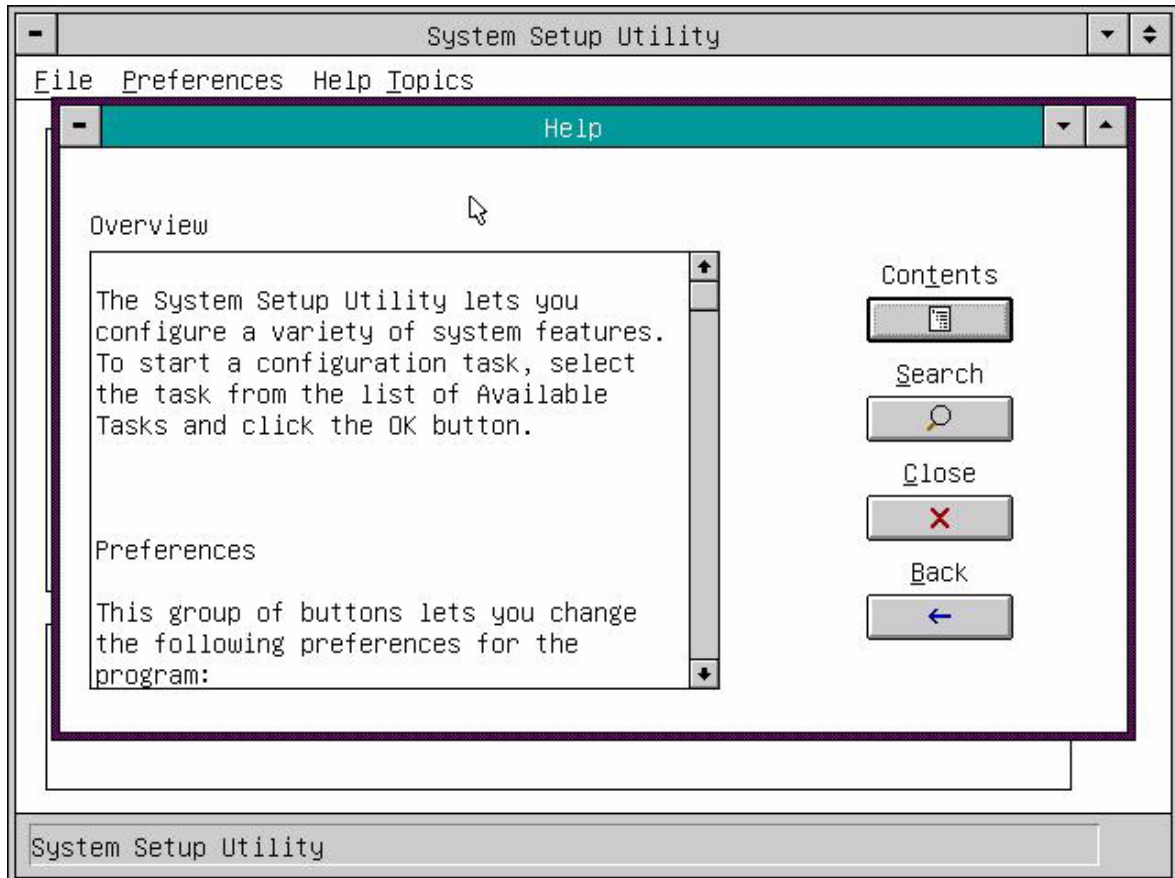


Application Framework Help subsystem

In addition to the main window, the AF also provides a help subsystem that is used by both the AF and each add-in included with the SSU. The help subsystem includes three windows: the "Help Display Window", the "Help Contents Window" and the "Help Search Window".

Help Display Window

The Help Display Window is accessible via the Help button on the AF main window or via the F1 accelerator key (to provide context-sensitive help). The Help Display Window displays information about a help topic.



Running the SEL Viewer

The SSU SEL Viewer can be run from the Resource CD that ships with your blade server. Alternately, the latest SSU utility image can be downloaded (contact your Intel customer representative for more information). If you download the latest image of the SSU utility:

- Create floppy disks of the image
- Boot your blade server with the first floppy disk.
- Insert the second floppy disk when prompted to do so by the system.
- The SSU will launch once the setup is complete.

SEL Viewer Utility hot keys

Mouse functionality is not necessary to navigate through the SEL Viewer Utility. Hot keys may be used by pressing the **Alt** key in combination with the underlined letter in the command. For example, press **Alt + F** for expanding the File menu options.

Main Screen			
File			Expands the File menu options
	Exit		Exits the SEL Viewer Utility
		Ok	Accepts your input
		Cancel	Cancels and closes the window
Preferences			Allows you to change the visual colors
	Color		Expands color options
		Foreground Color	Changes foreground color
		Background Color	Changes background color
		Ok	Accepts your input
		Cancel	Cancels and closes the window
	Other		Expands other options
		Status Bar Enable	Enables the status bar
		Status Bar Disable	Disables the status bar
		Ok	Accepts your input
Cancel		Cancels and closes the window	
Help Topics			Expands the Help Topic Options
	Help Contents		Displays help options
		Select keyword to display content	Allows you to select which content to view
		Select help subject	Allows you to select which help subject to view
		Display	Displays the selected help contents
		Cancel	Cancels and closes the window
		Help Search	
	Type in the keyword to find		Allows you to input the keyword
	Select keyword to display content		Allows you to select a topic
	Display		Displays the selected help content

		Cancel	Cancels and closes the window	
	About SSU		Displays the version of the SEL Viewer and copyright information	
		Ok	Closes the window	
SEL Manager				
File			Expands the File menu options	
	Open		Opens the window to open or locate a saved file	
		File Name	Allows you to assign a file name	
		Directories	Allows you to navigate to the directory where the file is located	
		Drives	Allows you to navigate to the drive where the file is located	
		Ok	Accepts your input	
		Cancel	Cancels and closes the window	
	Save As			Gives you the option to save the file
		File Name	Allows you to assign a file name	
		Directories	Allows you to select which directory to save the file in	
		Drives	Allows you to select which drive to save the file on	
		Ok	Accepts user input	
		Cancel	Cancels and closes the window	
	Exit		Exits out of the SEL Manager	
	SEL			Expands the SEL options
		Properties		Displays the SEL properties
Clear SEL			Clears the SEL log	
Reload			Reloads the SEL	
Sort by			Allows you to select the sort method	

Online (OS present) upgrading of firmware

The One-Boot Flash Update Utility is a program used for updating the BMC firmware and SDRs while the Intel® Server Compute Blade SBX44 is running the operating system. This utility is supported when the blade server is running either Red Hat* Linux 9.0 or Microsoft* Windows* Server 2003.

Upgrading firmware from Red Hat* Linux 9.0

1. Download the appropriate Online (OS present) firmware update package for your Intel® Server Compute Blade SBX44 system. (Contact your Intel customer representative for more information.)

2. Copy the following files to a folder on your hard drive (e.g., /ofu):
 - `Flashupdt-1.5.6-n.i386.rpm`
 - The RPM files for the IPMI driver, `ipmidrvr-6.1-1-1.i386.rpm` (provided with the utility)
 - `installme`
3. Run the `./installme` script from the Linux directory by entering the following commands at the command-line prompt:

```
cd /ofu
./installme
```

4. Follow the instructions on your screen.
 - The script tries to verify that the `w3c` libraries are installed. If the `w3c-libwww` package is not installed, then the script will exit and display a message indicating that the `w3c-ww` package must be installed prior to installing the One-Boot Flash Update utility.
 - If the `w3c-libwww` package is already installed, then the `installme` script will install the One-Boot Flash Update utility.
 - Next, the `installme` script dynamically builds and installs the IPMI drive. Note that the kernel source is required in order for the driver to be built and installed to the server.
5. Upon successful completion of the `installme` script, the utility and the flash update driver files will be located in the `/usr/local/flashupdt` directory. The `ipmidrvr` RPM file copies the IPMI driver, named `imb`, into the `/usr/local/ism/driver` directory, and its startup script, `ipmi`, is copied to the `/etc/rc.d/init.d` directory.

— NOTE

In order to run the utility, the working directory must first be set to the directory in which the utility is installed. This is required because the utility depends on certain files (located in the `enus` sub-folder), which are expected to be located in the working directory.

Running the One-Boot Flash Update Utility

The command line format is:

```
flashupdt [options]
```

Table 36. One-Boot Flash Update Utility command-line switches for Red Hat Linux 9.0*

Parameter	Description
<code>flashupdt</code>	The name of the utility. Note that Linux is case sensitive.

Table 36. One-Boot Flash Update Utility command-line switches for Red Hat* Linux 9.0

Parameter	Description
-i	<p>This option displays the following information read from the system:</p> <ul style="list-style-type: none"> • BIOS ID - The fields of the ID displayed are: board ID and revision, OEM ID, build ID, and build type. These fields are separated by periods, for example, SBX44.86B.0001.B02 • BMC version - Major and minor revision of the Op Code, PIA and Boot Code • SDR version • SDR package version <p>The syntax is: <code>./flashupdt -i</code></p> <p>This option can also be used in conjunction with the <code>-u</code> option to display version information contained in the update package files.</p> <p>The syntax is: <code>./flashupdt -i -u{URL or path}</code></p>
-u{URL or path}	<p>This option is used to update the system as specified in the CFG file. An URL or path, if any, must immediately follow this option, separated by a space. The CFG file can also be specified with the URL or path; otherwise, the default CFG file <code>flashupdt.cfg</code> is used.</p> <p>– NOTE If the <code>-u</code> option is used in conjunction with <code>-i</code>, the utility does not perform an update. Instead, it displays the version information of the update package files, as described above.</p>
-c	<p>This option is used to cancel all pending update operations that were performed using the utility. The utility resets the internal flags in the BMC and SDR to cancel the update operation, whether there is one or not.</p>
-h or -?	<p>This option displays command-line help information.</p>

Upgrading firmware from Microsoft* Windows* Server 2003

1. Download the appropriate Online (OS present) firmware update package for your Intel® Server Compute Blade SBX44 system. (Contact your Intel customer representative for more information.)
2. The update package will contain the `ofu-win32.zip` file and the associated firmware files. Unzip the `ofu-win32.zip` file into a folder on your hard drive (for example, `c:\ofu`). This basically installs the files needed to run the utility.
3. This utility also requires an IPMI driver. To install the IPMI driver, open a command-line prompt and change to that directory.
4. Execute the script `install.cmd <full path>` specifying the full path of the folder in which you unzipped the file (e.g., `install c:\ofu`). This step installs the IPMI driver.

– NOTE

In order to run the utility, the working directory must first be set to the directory in which the utility is installed. This is required because the utility depends on certain files (located in the `enus` sub-folder), which are expected to be located in the working directory.

Running the utility

The command-line format is

```
./flashupdt [options]
```

Table 37. One-Boot Flash Update Utility command-line switches for Microsoft Windows* Server 2003*

Parameter	Description
<code>flashupdt</code>	The name of the utility. Note that Linux is case sensitive.
<code>-i</code>	<p>This option displays the following information read from the system:</p> <ul style="list-style-type: none">• BIOS ID - The fields of the ID displayed are: board ID and revision, OEM ID, build ID, and build type. These fields are separated by periods, for example, SBX44.86B.0001.B02• BMC version - Major and minor revision of the Op Code, PIA and Boot Code• SDR version• SDR package version <p>The syntax is: <code>flashupdt -i</code></p> <p>This option can also be used in conjunction with the <code>-u</code> option to display version information contained in the update package files.</p> <p>The syntax is: <code>flashupdt -i -u{URL or path}</code></p>
<code>-u{URL or path}</code>	<p>This option is used to update the system as specified in the CFG file. An URL or path, if any, must immediately follow this option, separated by a space. The CFG file can also be specified with the URL or path; otherwise, the default CFG file <code>flashupdt.cfg</code> is used.</p> <p>– NOTE</p> <p>If the <code>-u</code> option is used in conjunction with <code>-i</code>, the utility does not perform an update. Instead, it displays the version information of the update package files, as described above.</p>
<code>-c</code>	This option is used to cancel all pending update operations that were performed using the utility. The utility resets the internal flags in the BMC and SDR to cancel the update operation, whether there is one or not.
<code>-h</code> or <code>-?</code>	This option displays command-line help information.

Online (OS present) upgrading of BIOS

The AFUI*** utility is a program used for updating the BIOS while the Intel® Server Compute Blade SBX44 is running an operating system. This utility is supported when the blade server is running either Red Hat* Linux 9.0 or Microsoft* Windows* Server 2003.

Upgrading the BIOS from Red Hat* Linux 9.0

The BIOS is implemented as firmware that resides in flash ROMs. Use the command shell and run the AFUILNX utility from the Linux operating system to upgrade the BIOS.

To upgrade the BIOS, do the following:

1. Boot the system into Red Hat Linux 9.0.
2. Download the appropriate package of the BIOS for the Intel® Server Compute Blade SBX44. (Contact your Intel customer representative for more information.)
3. The update package contains the AFUILNX utility and the associated BIOS files. Copy the files to your local hard drive.
4. Open a command shell and run the AFUILNX utility from a USB key device, hard disk or CD with the required command line options as follows:

```
./afuilnx /i:filename
```

where,

filename is the name of the xxxxxxxx.rom file

The command-line options for the AFUILNX utility are as follows:

```
afuilnx /M:<Machine Type/Model> /B:<Box Serial Number> /A:<Asset Tag> /E:<Unique ID> /D:<Drive:\Path\Filename> /S:<Drive:\Path\Filename> /I:<Drive:\Path\Filename> /2 /N /R
```

See Table 34 on page 105 for an explanation of each of the command-line switches.

Upgrading the BIOS from Microsoft* Windows* Server 2003

The BIOS is implemented as firmware that resides in flash ROMs. Use the command window and run AFUIWIN from the Windows operating system to upgrade the BIOS.

To upgrade the BIOS, do the following:

1. Boot the system into Microsoft* Windows* Server 2003.
2. Download the appropriate package of BIOS for the Intel® Server Compute Blade SBX44. (Contact your Intel customer representative for more information.)
3. The update package contains the AFUIWIN utility and the associated BIOS files. Copy the files to your local hard drive.
4. Copy the .vxd and .sys files to the same directory as the AFUIWIN utility.

— NOTE

If this is not done, the update will fail.

5. Open a command shell and run the AFUIWIN utility from a USB key device, hard disk or CD with the required command line options as follows:

```
AFUIWIN /i:filename
```

where,

filename is the name of the xxxxxxxx.rom file

6. Reboot the system.

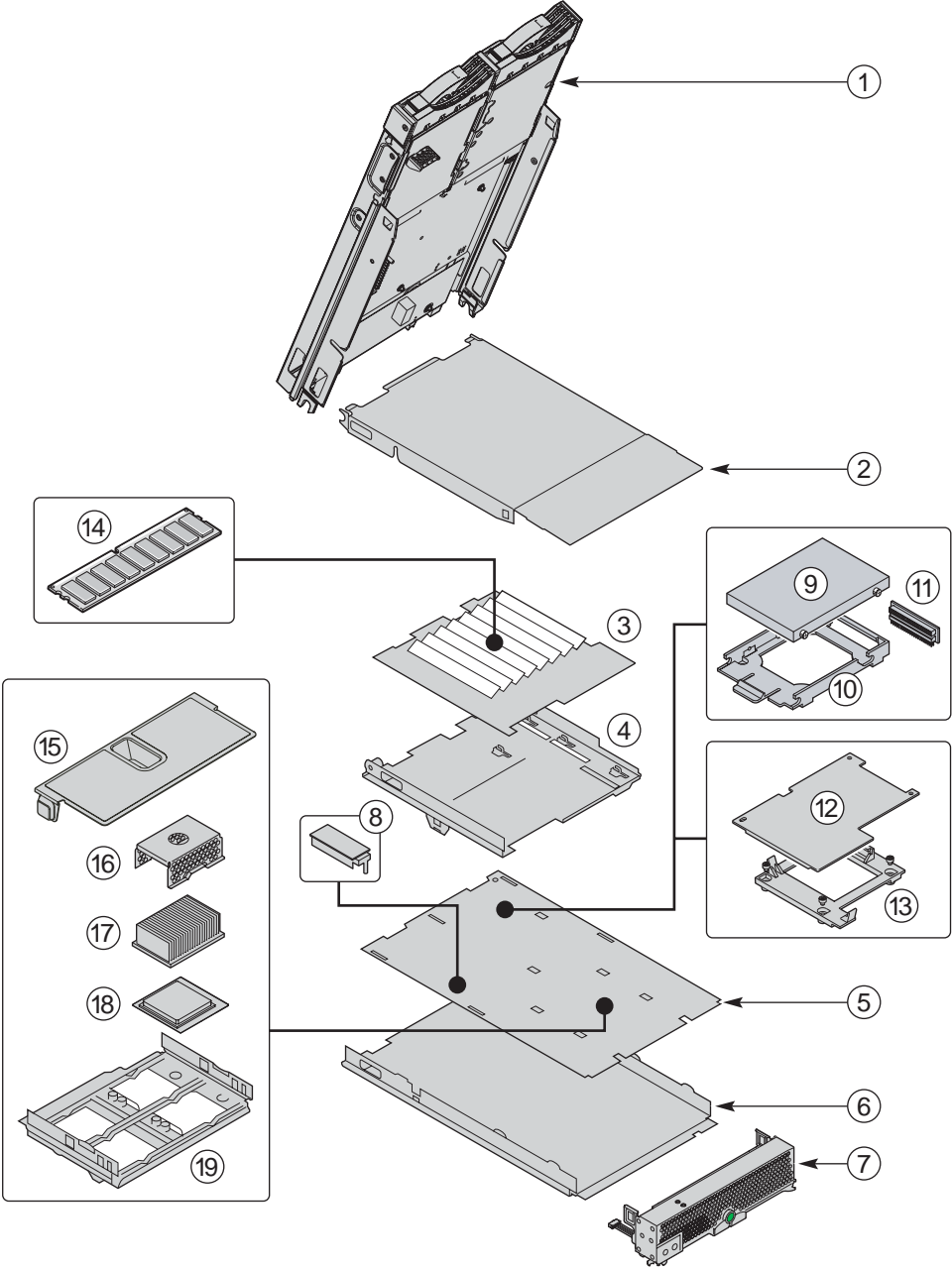
The command-line options for the AFUIWIN utility are as follows:

```
AFUIWIN /M:<Machine Type/Model> /B:<Box Serial Number> /A:<Asset Tag> /E:<Unique  
ID> /D:<Drive:\Path\Filename> /S:<Drive:\Path\Filename> /I:<Drive:\Path\Filename>  
/2 /N /R
```

See Table 34 on page 105 for an explanation of each of the command-line switches.

6 Parts listing, Server Compute Blade SBX44

This parts listing supports the Intel® Server Compute Blade SBX44.



TP00442

System

— NOTE

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

Index	System	CRU/FRU
1	SCSI storage expansion unit (optional)	CRU
2	Top cover assembly	CRU
3	I/O board	FRU
4	I/O board base mount	FRU
5	CPU board	FRU
6	Chassis assembly (base blade)	FRU
7	Front bezel	FRU
8	Terminator card	CRU
9	IDE hard drive	CRU
10	IDE hard drive tray	FRU
11	IDE connector	FRU
12	I/O expansion option	FRU
13	I/O expansion option tray	FRU
14	Memory module	CRU
15	Air baffle	FRU
16	Heatsink filler	FRU
17	Heatsink	FRU
18	Microprocessor	FRU
19	CPU retention mechanism	FRU

A Related service information

– NOTE

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

Safety information

The following section contains the safety information that you need to be familiar with before servicing the system.

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 your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that 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 attached power cords, telecommunication systems, networks, and modems before you open the server covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

⇒ Important

⇒ Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- 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 the 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 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 mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
 - Power supply units
 - Pumps
 - Blowers and fans
 - Motor generatorsand similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
 - Use caution; do not become a victim yourself.
 - Switch off power.
 - Send another person to get medical aid.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (ICs) 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.

Notes:

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

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.

- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those in the following list, to provide protection that meets the specific service requirement.

— **NOTE**

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

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
- Use the round ground-prong of the AC plug on AC-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

— **Important**

- All caution and danger statements in this documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in this section.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in this section under statement 1.

Be sure to read all caution and danger statements before performing any of the instructions.



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



 **CAUTION:**

When replacing the lithium battery, use only the same or an equivalent type battery that is 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.



 **CAUTION:**

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

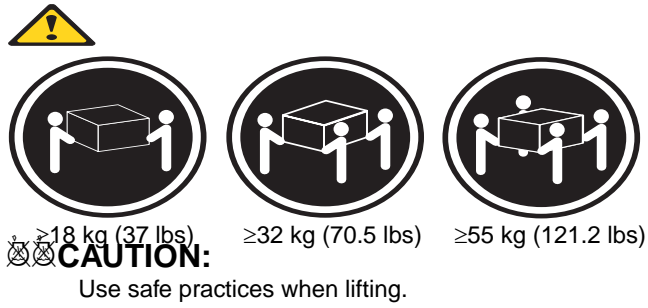
- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous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



⇒ DANGER

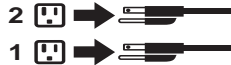
- **Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:**

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



CAUTION:

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:

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.