

# Intel<sup>®</sup> Server Board SE7501HG2 Product Guide

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**A Guide for Technically Qualified Assemblers of Intel<sup>®</sup> Identified  
Subassemblies/Products**

Order Number: C18223-004

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# 1 Description

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## Server Board Features

The Intel® server board SE7501HG2 offers a “flat” design, with the processors and memory subsystems residing on the board. The server board supports dual-processor operation with Intel® Xeon™ processors in the Flipchip-micro Pin Grid Array2 (FC-mPGA2) package and the Intel® E7501 chipset. The board contains embedded devices for video, network, IDE, and provides basic monitoring hardware and interrupt control for dual-processors and PC/AT compatible operation.

**Table 1. Server Board Features**

Feature	Description
Processor	Dual 400 or 533 FSB Intel Xeon processors with 512KB L2 Cache
Chipset	Intel E7501 chipset: <ul style="list-style-type: none"><li>• Supports 533 MHz Front Side Bus (FSB)</li><li>• MCH memory controller (North Bridge)</li><li>• ICH3-S I/O controller (South Bridge)</li><li>• P64H2 64-bit I/O hub</li></ul>
Memory	<ul style="list-style-type: none"><li>• DDR266 compliant ECC DIMMs providing up to 12 GB of memory<sup>1</sup></li><li>• DIMM Sockets: Six 72-bit, 184-pin, gold contact</li><li>• Supported DIMM sizes: 128 MB, 256 MB, 512 MB, 1 GB, and 2 GB</li></ul>
Video	<ul style="list-style-type: none"><li>• Integrated onboard ATI Rage* XL 64-bit SVGA video controller</li><li>• 8 MB SDRAM video memory</li><li>• SVGA video port</li></ul>
PCI bus	Six PCI expansion slots for add-in full- or half-length boards: <ul style="list-style-type: none"><li>• One 64-bit, PCI-X 133 MHz expansion slot</li><li>• Two 64-bit, PCI-X 100 MHz expansion slots</li><li>• Three 32-bit, 33 MHz, PCI expansion slots</li></ul>
Network	Intel® Dual Port Gigabit Ethernet Controller (Intel® 82546EB), providing two RJ-45 connections
Integrated SCSI	Adaptec* AIC-7902 dual-channel U320 SCSI controller

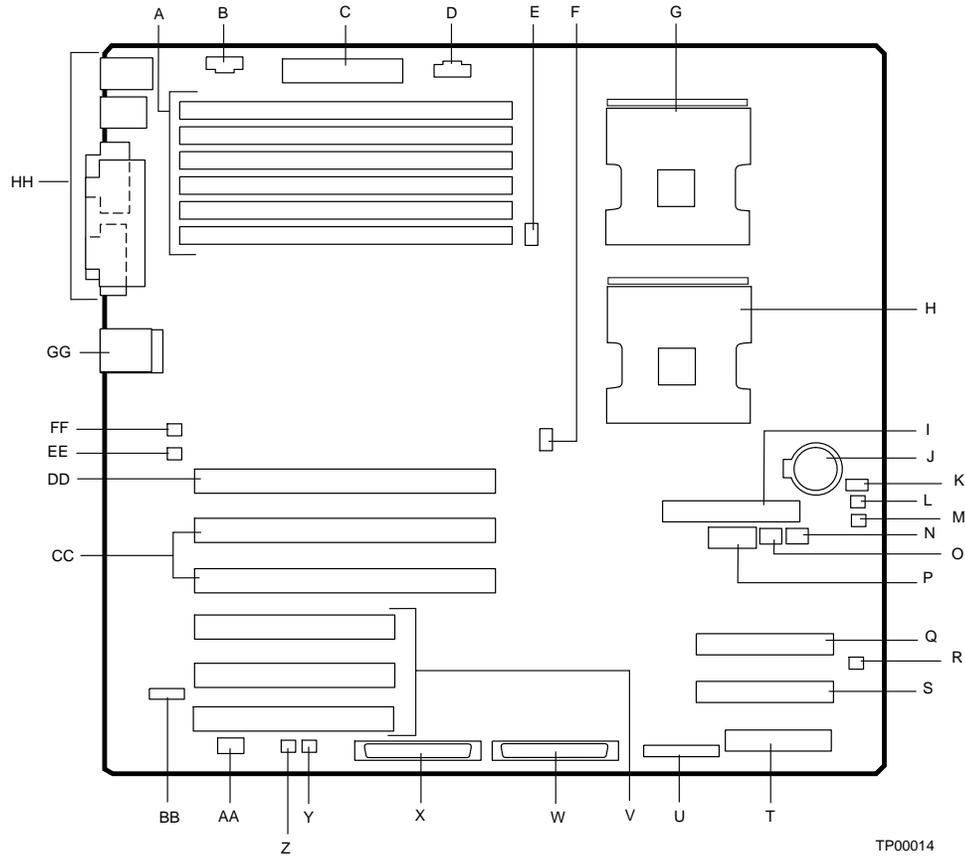
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<sup>1</sup> DDR200 compliant ECC DIMMs can be used only if 400 MHz processors are installed.

Feature	Description
System I/O	<p>National Semiconductor* PC87417 Super I/O Controller (LPC bus) that provides the following:</p> <ul style="list-style-type: none"> <li>• Floppy Disk Controller</li> <li>• PS/2-compatible keyboard and mouse ports, 6-pin DIN connectors</li> <li>• Advanced parallel port, supporting Enhanced Parallel Port (EPP) level 1.7 and 1.9, ECP, compatible 25-pin connector</li> <li>• Two serial ports: One a-synch 9-pin RS-232C, one via 10-pin internal connector</li> </ul> <p>One Ethernet controller (Intel 82546EB) providing two 1-gigabit RJ45 connections  Five USB ports: three stacked USB connectors in I/O rear panel, two via 10-pin internal header</p>
Power	<ul style="list-style-type: none"> <li>• SSI-EEB 3.0 compliant</li> <li>• Power/Sleep Switch with LED Indicator</li> <li>• Wake on LAN* (WOL)</li> <li>• Wake on Ring (WOR)</li> </ul>
Security	<ul style="list-style-type: none"> <li>• BIOS password</li> <li>• Keyboard password protection</li> <li>• Floppy write-protect</li> </ul>
Form Factor	<ul style="list-style-type: none"> <li>• SSI-EEB 3.0 compliant form factor</li> </ul>

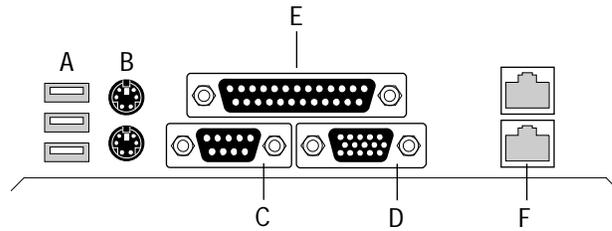
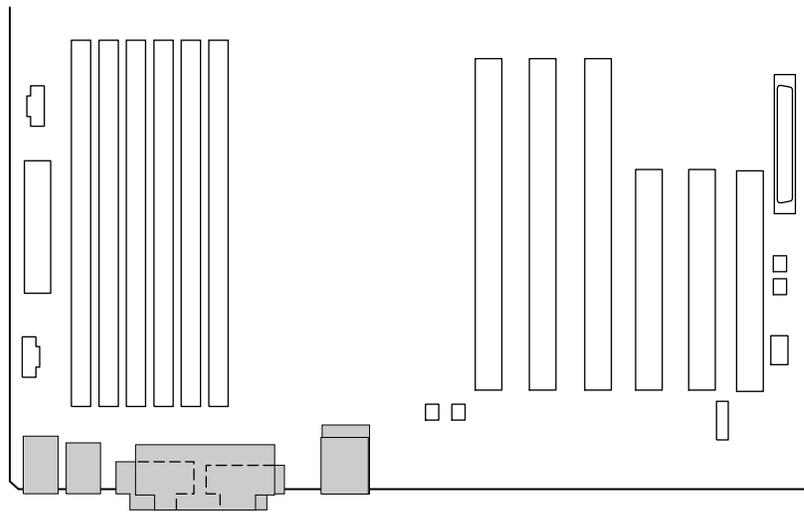
# Server Board Connector and Component Locations



- |   |                                   |    |                            |
|---|-----------------------------------|----|----------------------------|
| A | DIMMs                             | S  | Secondary IDE              |
| B | Aux Power                         | T  | Front Panel Connector      |
| C | Main Power                        | U  | Configuration Jumper Block |
| D | + 12 V CPU Power                  | V  | PCI 32-bit/33 MHz          |
| E | CPU 1 Fan                         | W  | SCSI Channel B             |
| F | CPU 2 Fan                         | X  | SCSI Channel A             |
| G | Primary Processor Socket (CPU1)   | Y  | HDD LED Connector          |
| H | Secondary Processor Socket (CPU2) | Z  | Chassis Intrusion          |
| I | Floppy Disk Drive Connector       | AA | Serial B Connector         |
| J | Battery                           | BB | ICMB                       |
| K | IPMB                              | CC | PCI-X 64-bit/100 MHz       |
| L | System Fan 4                      | DD | PCI-X 64-bit/133 MHz       |
| M | System Fan 4                      | EE | System Fan 2               |
| N | HSBP B                            | FF | System Fan 1               |
| O | HSBP A                            | GG | Dual 1000 GB NIC           |
| P | USB Header                        | HH | System I/O Connectors      |
| Q | Primary ATA                       |    |                            |
| R | System Fan 3                      |    |                            |

**Figure 1. Server Board Connector and Component Locations**

# Back Panel Connectors



TP00027

- |   |                 |   |  |
|---|-----------------|---|--|
| A | USB 1, 2, 3     | D | Video  |
| B | Mouse, Keyboard | E | Parallel   |
| C | Serial A        | F | Gigabit NIC ports<br>(NIC 2 on top, NIC 1 on bottom) |

**Figure 2. Back Panel Connectors**

## Intel® E7501 Chipset

The SE7501HG2 server includes the Intel E7501 chipset (MCH, ICH3-S, P64H2), which provides an integrated I/O bridge and memory controller, and a flexible I/O subsystem core (PCI).

### MCH

The E7501 MCH North Bridge (MCH) integrates three main functions:

- An integrated high performance main memory subsystem
- An HI 2.0 bus interface that provides a high-performance data flow path to the P64H2 (I/O Bridge)
- An HI 1.5 bus that provides an interface to the ICH3-S (South Bridge)

Other features provided by the MCH include the following:

- Full support of ECC on the memory bus
- Full support of Intel® x4 Single Device Data Correction on the memory interface with x4 DIMMs
- Twelve deep in-order queue
- Full support of registered DDR266 ECC DIMMs<sup>2</sup>
- Support for 12 GB of DDR memory
- Memory scrubbing

### P64H2

The primary role of the P64H2 is to provide an integrated I/O bridge to the 64-bit PCI-X segments. This subsystem supports two peer 64-bit PCI-X segments, each with two 64-bit/100MHz PCI-X slots. The Adaptec\* AIC-7902 embedded controller is enabled via one of the PCI-X segments of the P64H2.

### ICH3-S

The primary role of the ICH3-S is to provide the gateway to all PC-compatible I/O devices and features. The SE7501HG2 uses the following ICH3-S features:

- 32-bit/33 MHz PCI bus interface
- Low Pin Count (LPC) bus interface
- IDE interface, with Ultra DMA 100 capability
- Universal Serial Bus (USB) interface
- PC-compatible timer/counter and DMA controllers
- APIC and 8259 interrupt controller
- Power management
- General purpose I/O
- System RTC

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<sup>2</sup> DDR200 compliant ECC DIMMs can be used only if 400 MHz processors are installed

## Super I/O

The National Semiconductor\* PC87417 Super I/O Plug-and-Play Compatible with ACPI-Compliant Controller/Extender is used on the SE7501HG2 server board. This device provides the system with:

- Two serial ports
- One parallel port
- Floppy disk controller (FDC)
- PS/2-compatible keyboard and mouse controller
- Wake event control

## Serial Ports

One DB9 connector is provided on the back panel for the Serial A port. The Serial A port is compatible with 16550A and 16450 modes. This port can be set to one of four different COM ports, each of which can be enabled separately. When enabled, each port can be programmed to generate edge- or level-sensitive interrupts. When disabled, the serial port interrupts are available for add-in cards.

A DH10 10-pin serial header is available on the baseboard for an optional Serial B port. Serial port B port can be used as an Emergency Management Port.

## Parallel Port

The SE7501HG2 baseboard provides a 25-pin parallel port back panel connector. The Super I/O provides an IEEE 1284-compliant 25-pin bi-directional parallel port. BIOS programming of the Super I/O registers enables the parallel port and determines the port address and interrupt. When disabled, the interrupt is available to add-in cards.

## Floppy Disk Connector

The floppy disk connector on the server board provides the interface to the floppy disk drive from the floppy disk controller. BIOS Setup provides options to select the type of floppy disk drive installed, or to disable the floppy disk controller.

## Keyboard and Mouse Connectors

The separate keyboard and mouse connectors, found on the back panel of the server board, are PS/2 compatible and are interchangeable. Setup does not include an option to disable the keyboard or mouse. Instead, they are automatically detected and tested at system startup. The system can be booted with either or both disconnected.

## Processor

The Intel® Server Board SE7501HG2 accommodates one or two 400 MHz FSB or 533 MHz FSB Intel Xeon processors with 512KB L2 Cache via two SKT604 604-pin zero-insertion force (ZIF) sockets. The processors interface with the system bus at 400 MHz or at 533 MHz. When only one processor is installed, it should be in the socket labeled CPU1 and the other socket must be empty.

For a complete list of supported processors, see:

<http://support.intel.com/support/motherboards/server/SE7501HG2>

## Dual Processor Operation

The Intel Xeon processor interface is dual-processor (DP)-ready. The processor subsystem includes a single VR (Voltage Regulator) to support both processors. Interrupt generation and notification for the processors is done by the Advanced Programmable Interrupt Controllers (APICs) in the ICH3-S and P64H2. When two processors are installed, both processors must be of identical revision, core voltage, and bus/core speeds.

## Boxed Processor Fan Heat Sink

A processor wind tunnel (PWT) is supplied with each boxed Intel Xeon processor. After the processor and heat sink are installed, install and connect the processor wind tunnels.

### ⇒ NOTES

Heat sink styles vary. If your heat sink has a flat end, the flat surface must be installed so that it faces the rear of the chassis. See the installation instructions in Chapter 2.

Do not install the Processor Wind Tunnel when using the Intel® Server Chassis SC5200 with hot swap redundant power. For this chassis, see the installation instructions beginning on page 46.

When not using the SC5200 with hot swap redundant power, refer to the instructions in this document, the instructions included with your boxed processor, or the instructions in the *SE7501HG2 Quick Start User's Guide*.

For proper processor cooling, the fan inlet air temperature should be below 45 C.



### CAUTION

Clearance is required at each end of the fan heat sink to ensure unimpeded airflow for proper cooling. Restricting the airflow through the processor heat sink can cause overheating and subsequent failure of the processor.

## Memory

The Intel® Server Board SE7501HG2 contains six 184-pin DIMM sockets and provides support for up to 12 GB of memory. The memory subsystem provides dual memory bus architecture; the memory on the board is partitioned into three banks of DDR DIMMs. DIMMs must be installed in pairs, providing a 144-bit wide data path via three separate memory buses. DIMMs must also be installed in order by Bank. Bank 1 must be filled before populating Bank 2. Bank 2 must be populated before installing DIMMs in Bank 3.

The memory controller supports 2-way interleaved SDRAM, memory scrubbing, single-bit error correction and multiple-bit error detection with the Intel x4 Single Device Data Correction capability that allows the system to continue to run even in the event of a multi-bit SDRAM failure.

Memory can be implemented with either single-sided (one row) or double-sided (two row) DIMMs. The server board supports up to six ECC DDR DIMMs that are compliant with the JEDEC DDR 266 specification. A wide range of DIMM sizes are supported, including:

- 128 MB
- 256 MB
- 512 MB
- 1 GB
- 2 GB

The minimum supported memory configuration is 256 MB, using two 128 MB DIMMs. The maximum configurable memory size is 12 GB using six 2 GB DIMMs. Each DIMM within a bank must be identical, but each bank can use different sized DIMMs. For example, Bank 1 can have two 128 MB DIMMs installed and Bank 2 can have two 256 MB DIMMs installed. DIMMs from different vendors can be used, but is not recommended because the system defaults to the slowest speed that will work with all of the vendors' DIMMs.

### ⇒ NOTE

Use DIMMs that have been tested for compatibility with the server board.  
Check the Intel Customer Support website for the latest tested memory list:

*<http://support.intel.com/support/motherboards/server/SE7501HG2>*

## PCI I/O Subsystem

The SE7501HG2 server board provides three PCI bus segments:

- Segment C with one PCI-X 64-bit / 133 MHz slots (Slot 1)
- Segment B with two PCI-X 64-bit / 100 MHz slots (Slots 2<sup>3</sup> and 3)
- Segment A with three PCI 32-bit / 33 MHz slots (Slots 4, 5, and 6)

The least capable card installed on a segment determines the bus mode/speed. In other words, the segment will run at the speed of the slowest installed card.

---

<sup>3</sup> Slot 2 supports Zero Channel RAID

## Segment C: 64-bit / 133 MHz PCI-X Capable Subsystem

The 64-bit/133 MHz PCI-X segment includes:

- One 3.3 V keyed full-length, full height PCI expansion slots that can support PCI-X add in cards up to 133 MHz (PCI-X Slot 1). This slot is backward compatible to 64-bit/100 MHz, 64-bit/66 MHz, 64-bit/33 MHz, and universal keyed 32-bit/33 MHz PCI cards.
- Dual Channel Gigabit Ethernet Controller (Intel 82546EB)

The PCI-X features include:

- Bus speed up to 133 MHz
- 3.3 V signaling environment
- Burst transfers up to a peak of 1000 Megabytes per second (MB/s)
- 8-, 16-, 32-, or 64- bit data transfers
- Plug-and-Play ready
- Parity enabled

### ⇒ NOTES

If you install a slower card into the PCI-X 64/133 connector, the bus speed for the connector and for the onboard NICs will be lowered to the speed of the installed card.

## Segment B: 64-bit / 100 MHz PCI-X Capable Subsystem

The 64-bit/100 MHz PCI-X segment includes the following embedded device and connectors:

- Two 3.3 V keyed full-length, full height PCI expansion slots that can support PCI-X add in cards running at 100 MHz (PCI-X Slots 2 and 3)<sup>4</sup>. These slots are backward compatible to 64-bit/66 MHz, 64-bit/33 MHz and universal keyed 32-bit/33 MHz PCI cards.
- Integrated Adaptec AIC-7902 U320 Dual Channel SCSI Controller

The PCI-X features include:

- Bus speed up to 100 MHz
- 3.3 V signaling environment
- Burst transfers up to a peak of 800 Megabytes per second (MB/s)
- 8-, 16-, 32-, or 64-bit data transfers
- Plug-and-Play ready
- Parity enabled

### ⇒ NOTE

If you install a slower card into one of the PCI-X 64/100 connectors, the bus speed for both connectors and for the onboard SCSI will be lowered to the speed of the slowest adapter.

---

<sup>4</sup> Slot 2 supports Zero Channel RAID

## Zero Channel RAID

The SE7501HG2 server board supports two Zero Channel RAID cards: the Intel<sup>®</sup> SRCZCR RAID Adapter and the Adaptec\* ASR-2010S RAID adapter. This support is provided via hardware and BIOS support only on PCI-X Slot 2. If either of these RAID cards is installed, then the SCSI interrupts are routed to the RAID adapter instead of to the PCI interrupt controller.

## Segment A: 32-bit/33 MHz PCI Subsystem

The 32-bit / 33 MHz PCI segment includes the following embedded devices and connectors:

- Three 5 V keyed full-length, full height PCI expansion slots (PCI Slots 4, 5 and 6)
- Integrated ATI Rage XL video controller with 8 MB of on-board SDRAM

32-bit/33 MHz PCI features include:

- Bus speed up to 33 MHz
- 5 V signaling environment
- Burst transfers up to a peak of 132 MB/s
- 8-, 16-, or 32-bit data transfers
- Plug-and-Play ready
- Parity enabled

## Video

The system has an integrated ATI Rage XL 32-bit high-performance SVGA subsystem that supports the following:

- BIOS compatibility with all standard VGA modes
- 8 MB of video memory
- Pixel resolutions up to 1600 x 1200 pixels per inch (ppi) in 8/16/24/32 bpp modes under 2D and up to 1024 x 768 ppi in 8/16/24/32 bpp modes under 3D
- Both CRT and LCD monitors up to 100 Hz vertical refresh rate

**Table 2. Video Modes**

2D Mode	Refresh Rate (Hz)	SE7501HG2 2D Mode Video Support			
		8 bpp	16 bpp	24 bpp	32 bpp
640x480	60, 72, 75, 90, 100	Supported	Supported	Supported	Supported
800x600	60, 70, 75, 90, 100	Supported	Supported	Supported	Supported
1024x768	60, 72, 75, 90, 100	Supported	Supported	Supported	Supported
1280x1024	43, 60	Supported	Supported	Supported	Supported
1280x1024	70, 72	Supported	–	Supported	Supported
1600x1200	60, 66	Supported	Supported	Supported	Supported
1600x1200	76, 85	Supported	Supported	Supported	–
3D Mode	Refresh Rate (Hz)	SE7501HG2 3D Mode Video Support with Z Buffer Enabled			
640x480	60, 72, 75, 90, 100	Supported	Supported	Supported	Supported
800x600	60, 70, 75, 90, 100	Supported	Supported	Supported	Supported
1024x768	60, 72, 75, 90, 100	Supported	Supported	Supported	Supported
1280x1024	43, 60, 70, 72	Supported	Supported	–	–
1600x1200	60, 66, 76, 85	Supported	–	–	–

3D Mode	Refresh Rate (Hz)	SE7501HG2 3D Mode Video Support with Z Buffer Disabled			
640x480	60, 72, 75, 90, 100	Supported	Supported	Supported	Supported
800x600	60, 70, 75, 90, 100	Supported	Supported	Supported	Supported
1024x768	60, 72, 75, 90, 100	Supported	Supported	Supported	Supported
1280x1024	43, 60, 70, 72	Supported	Supported	Supported	–
1600x1200	60, 66, 76, 85	Supported	Supported	–	–

## SCSI Controller

The embedded Adaptec AIC-7902 dual function SCSI controller provides Ultra320 (LVDS), (Ultra 4), and Ultra wide (SE) SCSI interfaces as two independent PCI functions.

The Intel SE7501HG2 baseboard provides active terminators, termination voltage, resettable fuse, and protection diode for both SCSI channels.

## IDE Controller

The system includes a dual-channel enhanced IDE 32-bit interface controller for intelligent disk drives with disk controller electronics onboard. The controller has both primary and secondary connectors on the system board, each of which supports a master and a slave device.

The device supports:

- PIO, ATA-100 Synchronous DMA, and bus master IDE transfer modes
- Ultra DMA 33/66/100 synchronous DMA transfers
- Master/slave IDE modes
- Up to four devices

## USB Interface

The server board SE7501HG2 provides three external USB connectors on the rear I/O panel. Revision 1.1 of the USB Specification defines the external connectors. An additional USB controller is supported internally through a 10-pin header on the server board that can be cabled to two additional USB ports on the front panel board. All five ports function identically and with the same bandwidth.

## Network Interface Controller

The server board includes one integrated onboard Network Interface Controllers (NIC) that provides two RJ45 ethernet ports. The NIC is a 10BASE-T/100BASE-TX/1000BASE-TX network solution based on the Intel 82546EB single-chip Fast Ethernet PCI Bus Controller. As a PCI bus master, the controller can burst data at up to 132 MB/s. The controller contains two receive and transmit FIFO buffers that prevent data overruns or underruns while waiting for access to the PCI bus.

The NICs are stacked on top of each other, with NIC2 on the top and NIC1 underneath it. The controller can be disabled through the BIOS setup menu. Disabling the controller disables both NIC ports.

### ⇒ NOTE

To ensure EMC product regulation compliance, the system must be used with a shielded LAN cable.

## Supported Network Features

The SE7501HG2 supports the following features of the 82546EB controller:

- 32-bit PCI bus master interface (direct drive of bus), compatible with the *PCI Bus Specification, Revision 2.2*
- Chained memory structure with improved dynamic transmit chaining for enhanced performance
- Programmable transmit threshold for improved bus utilization
- Early receive interrupt for concurrent processing of receive data
- On-chip counters for network management
- Support for 10 Mb/s, 100 Mb/s, and 1000 Mb/s networks, full or half duplex-capable, with back-to-back transmit at 100 MB/s
- Auto-detect and auto-switching for 10, 100, or 1000 Mbps network speeds
- Low-power +3.3 V device
- Integrated physical interface to TX magnetics
- The magnetics component terminates the 100Base-TX connector interface. A flash device stores the network ID
- Support for Wake on LAN (WOL)
- Advanced Networking Service Features

## NIC Connector and Status LEDs

The 82546EB controller provides two RJ45 ports, each of which provides two LEDs, one to the left of each connector and the other to the right of the each connector when looking at the I/O area from the back of the board. The LEDs to the left of each connector indicate the connection speed and the right connectors indicate transmit / receive activity link/activity on the LAN and the speed of operation. See the following table for an overview.

**Table 3. 10/100/1000 Megabit LEDs**

LED Location	LED State	NIC State
Left of each RJ45 port	Off	10-Mbps
	Green	100-Mbps
	Yellow	1000-Mbps
Right of each RJ45 port	On	On
	Blinking	Transmit / Receive activity

## ACPI

The SE7501HG2 supports the Advanced Configuration and Power Interface (ACPI) as defined by the ACPI 1.0b. An ACPI-aware operating system can put the system into a sleep state in which the hard drives spin down, the system fans stop, and all processing is halted. In this state the power supply is still on and the processors dissipate some power, so the power supply fan and processor fans continue to run.

### ⇒ NOTE

ACPI requires an operating system that supports this feature.

The server board supports sleep states S0, S1, S4, and S5. When the server board is operating in ACPI mode, the operating system retains control of the system and the OS policy determines the entry methods and wake-up sources for each sleep state – sleep entry and wake-up event capabilities are provided by the hardware but are enabled by the operating system.

- S0: Normal running state.
- S1: DC Power remains on. The operating system saves the context and enters a low-power state. The system can wake from the S1 state using a PS/2 keyboard, mouse, or USB device, by pressing the power button press, or from a wakeup event.
- S4: Hibernate or Save to Disk. The memory and machine state are saved to disk. Pressing the power button or another wakeup event restores the system state from the disk and resumes normal operation. This assumes that no hardware changes were made to the system while it was off.
- S5: Soft off. Only the RTC section of the chip set is running in this state.



### CAUTION

The system is off only when the AC power is disconnected.

## Wakeup Events

The SE7501HG2 system supports several wakeup events.

### Wake on LAN

Wake on LAN allows system power to be activated through the network. If the system is in the S1 or S4 state, it can be turned on remotely by sending a specific packet to the remote system. The system contains a configuration option that allows the on-board NICs to be enabled to wake the system from a S4 or S5 sleep state, even if the operating system disabled Wake on LAN when it powered down the system. This provides an option for users who want to use standard, but non-secure, Wake on LAN capability for operations such as after-hours maintenance. Server management features provide a secure system power-up, plus the ability to provide BIOS boot option.

### Wake on Ring

Wake on Ring allows system power to be activated through the Serial ports when this option is enabled in Setup. If the system is in the S1 or S4 state, it can be turned on remotely by the Ring Indicate RI signals from the serial ports.

### ⇒ NOTE

Wake on Ring is disabled in Serial B if this port is used as the Emergency Management Port.

### Wake on RTC Alarm

Wake on RTC alarm allows system power to be activated through a real-time clock alarm when this option is enabled in Setup. If the system is in the S1 or S4 state, it can be turned on by an RTC trigger event.

# System Management

Intel integrates system management features into the hardware and provides additional features through Intel® Server Management software. For instructions on using the features described below, refer to the Configuration Software and Utilities chapter, beginning on page 81.

## Baseboard Management Controller

Intel server boards incorporate a baseboard management controller (BMC), which is a dedicated microcontroller for system management activities. The BMC performs the following functions:

- Monitors system components and sensors, including processors, memory, fans, power supplies, temperature sensors, and chassis intrusion sensors.
- Manages nonvolatile storage for the system event log (SEL), sensor data records (SDRs), and baseboard field-replaceable unit (FRU) inventory.
- Interfaces with the emergency management port (EMP) and LAN1 port to send alerts and interact with remote management systems.
- Provides the main front panel control functions (power on/off, reset, and so on).

## Field Replaceable Units and Sensor Data Records

Field replaceable units (FRUs) are major modules in the chassis that contain active electronic circuitry. FRUs can store information—such as board serial number, part number, name, and asset tag—that can be read using the System Setup Utility. The BMC stores FRU information for the baseboard in a nonvolatile storage component on the board.

The BMC uses Sensor Data Records (SDRs) to identify the sensors in the system for monitoring. SDRs provide a list of the sensors, their characteristics, location, type, and type-specific information, such as default threshold values, factors for converting a sensor reading into the appropriate units (mV, rpm, degrees Celsius), and information on the types of events that a sensor can generate. The BMC stores SDR information in a nonvolatile storage component on the baseboard.

You can use the FRU/SDR Load Utility to initialize or update the FRU and SDR information. Intel® server boards are shipped from the factory with some sensors disabled because the actual configuration of the chassis is only determined when the user completes the system configuration. For example, chassis-specific FRU information, such as chassis part number, must be configured when the system is configured. For these reasons, it is important to run the FRU/SDR Load Utility as part of the system setup process. You should also run the FRU/SDR Load Utility whenever you change the number of fans, processors, or power supplies in the server.

## System Event Log

The BMC manages a system event log (SEL), where it records significant or critical system events. These events include temperatures and voltages out of range, fan failures, and other sensor-related events. The BIOS, software, and other devices can also log events by sending messages to the BMC. The SEL is stored in nonvolatile storage.

You can view the current contents of the SEL by using the System Setup Utility.

## Platform Event Management

Events can trigger alerts and other actions by the BMC. The server is configured with the following set of standard events:

- Temperature sensor out of range
- Voltage sensor out of range
- Fan failure
- Chassis intrusion
- Power supply failure
- Memory error
- POST error
- Processor fault resilient booting (FRB) failure
- Fatal nonmaskable interrupt (NMI) from a source other than the front panel switch
- Watchdog timer reset, power down, or power cycle
- System restart (reboot)

Alerts can take either of these forms:

- **Platform Event Pages** – the BMC dials a paging service and sends a predefined paging string. To use platform event paging (PEP), you must attach an external modem to the emergency management port (Serial B).
- **BMC LAN alerts** – the BMC sends an alert to a predefined destination on the LAN.

You can configure PEP and BMC LAN alerts by using the Server Configuration Wizard or the System Setup Utility.

## Emergency Management Port

The emergency management port (EMP) refers to the use of the Serial B port, with either an external modem or direct serial connection, for remote management. The BMC controls the port and interfaces with remote access software, such as the Direct Platform Control or the Client System Setup Utility applications in Intel Server Management.

You can configure the EMP by using the Server Configuration Wizard or the System Setup Utility.

## EMP and Serial Over LAN

The Serial B port 10-pin header on the board can be configured in several different ways: as a standard serial port, as an Emergency Management Port, or for serial output redirection over a LAN. You can configure these settings using either the SSU or the SCW.

### ⇒ NOTES

**SC5200 Server Chassis considerations:** If you have configured the Serial B port for use as an emergency management port and set it to be “always available”, the Serial B port will be accessible only by remote server management software. The operating system will never be able to access the port.

If you have configured the Serial B port for Serial Over LAN, the port’s functionality will be impacted only when there is an active Serial Over LAN session from a remote console. At all other times either the operating system or the EMP will control the port, depending on your configuration.

## Intel® Server Management

Intel Server Management (ISM) is a system management package that is included on the ISM CD. ISM applications interact with the integrated hardware system management features of the server to allow you to monitor and manage a server. Some of the features provided are:

- The ability to connect to the server from a Windows\*-based client workstation over a LAN over a modem, or over a direct serial connection to the server, permitting you to manage the server from a remote location.
- Real-time monitoring and alerting for server hardware sensors.
- Emergency management when the server is off (but still connected to AC power) lets you verify the state of the server, diagnose hardware problems, and power on/off or reset the server.
- The ability to run the Client System Setup Utility to change the configuration of the managed server.

ISM can use an optional service partition on the managed server. The service partition is a special disk partition on the system drive that contains a ROM-DOS\* operating system and DOS-based utilities, including the System Setup Utility, FRU/SDR Load Utility, and other diagnostics packages you might choose to install. The server can be booted to the service partition, either locally or remotely, to provide access to the utilities.

For more information on Intel Server Management and the individual ISM applications, see the ISM CD.

# Security

The SE7501HG2 BIOS provides a number of security features. This section describes the security features and their operation.

## Summary of Software Security Features

The table below lists the software security features and describes what protection each offers. In general, to enable or set the features listed here, you must run the System Setup Utility and go to the Security Subsystem Group menu. The table below refers to other System Setup Utility menus and to the BIOS Setup utility.

**Table 4. Software Security Features**

Feature	Description
Secure mode	<p><b>How to enter secure mode:</b></p> <ul style="list-style-type: none"><li>• Setting and enabling passwords automatically places the system in secure mode.</li><li>• If you set a hot-key combination (through Setup), you can secure the system by pressing the key combination. This means you do not have to wait for the inactivity time-out period.</li></ul> <p><b>When the system is in secure mode:</b></p> <p>The server can boot and run the operating system, but mouse and keyboard input is not accepted until the user password is entered.</p> <p>At boot time, if a CD is detected in the CD-ROM drive or a diskette in drive A, the system prompts for a password. When the password is entered, the server boots from CD or diskette and disables the secure mode.</p> <p>If there is no CD in the CD-ROM drive or diskette in drive A, the server boots from drive C and automatically goes into secure mode. All enabled secure mode features go into effect at boot time.</p> <p><b>To leave secure mode:</b></p> <p>Enter the correct password(s).</p>
Disable writing to diskette	<p>In secure mode, the server will not boot from or write to a diskette unless a password is entered.</p> <p>To write protect access to diskette whether the server is in secure mode or not, use the Setup main menu, Floppy Options, and specify Floppy Access as read only.</p>

continued

**Table 4. Software Security Features** (continued)

<b>Feature</b>	<b>Description</b>
<p>Set a time-out period so that keyboard and mouse input are not accepted</p> <p>Screen can be blanked, and writes to diskette can be inhibited</p>	<p>Specify and enable an inactivity time-out period of from 1 to 120 minutes.</p> <p>If no keyboard or mouse action occurs for the specified period, attempted keyboard and mouse input will not be accepted.</p> <p>The monitor display will go blank, and the diskette drive will be write-protected (if these security features are enabled through Setup).</p> <p>To resume activity: Enter the correct password(s).</p>
<p>Control access to using the SSU: set supervisor password</p>	<p>To control access to setting or changing the system configuration, set a supervisor password and enable it through Setup.</p> <p>If both the supervisor and user passwords are enabled, either can be used to boot the server or enable the keyboard and/or mouse, but only the supervisor password will allow Setup to be changed.</p> <p>To disable a password, change it to a blank entry or press CTRL-D in the Change Password menu of the Supervisor Password Option menu found in the Security Subsystem Group.</p> <p>To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 7).</p>
<p>Control access to the system other than SSU: set user password</p>	<p>To control access to using the system, set a user password and enable it through Setup.</p> <p>To disable a password, change it to a blank entry or press CTRL-D in the Change Password menu of the User Password Option menu found in the Security Subsystem Group.</p> <p>To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 7).</p>
<p>Boot without keyboard</p>	<p>The system can boot with or without a keyboard. During POST, before the system completes the boot sequence, the BIOS automatically detects and tests the keyboard if it is present and displays a message.</p>
<p>Specify the boot sequence</p>	<p>The sequence that you specify in Setup will determine the boot order. If secure mode is enabled (a user password is set), then you will be prompted for a password before the server fully boots. If secure mode is enabled and the "Secure Boot Mode" option is also enabled, the server will fully boot but will require a password before accepting any keyboard or mouse input.</p>

## Secure Mode

Secure mode refers to a system state where many of the external inputs and outputs are disabled to prevent tampering. These include PS/2 ports, floppy and on-board video. When secure mode is in effect, you must enter a password before the system will accept any PS/2 keyboard or mouse input, except for the password entry. When secure mode is in effect, you cannot turn off the system power or reset the server from the front panel switches.

Secure mode has no effect on functions enabled via remote server management or power control via the watchdog timer.

Taking the system out of secure mode does not change the state of system power. In other words, if you press and release the power button while secure mode is in effect, the system will not be powered down when secure mode is later removed. However, if the front panel power button remains depressed while secure mode is removed, the server will be powered off.

Secure mode is configured through the BIOS setup options or through the System Setup Utility.

## Hot Key Activation

A hot key combination allows the user to activate secure mode immediately instead of waiting for the configured inactivity time-out to expire. The hot key combination is configured through Setup. Either Ctrl-Alt-L or Ctrl-Alt-Z can be configured as valid hot keys.

### ⇒ NOTE

Hot keys work only with PS/2 keyboards.

## Secure Boot Mode (Unattended Start)

The Secure Boot mode allows the system to boot and run the operating system without requiring the user password, even if the user password is set. However, until the user password is entered, mouse and keyboard input is not accepted (except for password entry). If Secure Boot is enabled, secure mode is enabled shortly before boot. To prevent unauthorized tampering with any option ROM based setup utilities, enable the “Option ROM Menu Mask” setting in the security menu.

## Using Secure Boot

When secure mode is in effect:

- You can boot the server and the operating system will run, but you must enter the user password to use the keyboard or mouse.
- You cannot turn off system power or reset the server from the front panel switches.

Secure mode has no effect on functions enabled via the Server Manager Module or power control via the real time clock.

## Password Protection

The BIOS uses passwords to prevent unauthorized tampering with the system.

Entering the user password permits the modification of the time, date, language, user password, and password on boot setup fields. When a user password is configured, the server can be booted into secure mode. See the Secure Boot Mode (Unattended Start) section above. Other setup fields can be modified only if the administrator password is entered.

If a wrong password is entered three times in a row, the BIOS stops validating passwords and the BIOS security engine returns a failure for any further password validation attempt. If the user enters three wrong passwords in a row during the boot sequence (i.e., when entering Setup), the system is placed into a halt state. This feature makes it difficult to break the password by the “trial and error” method. When entering a password, the backspace key is accepted as a character of the password. Pressing the backspace key to replace a mistyped character will result in a wrong password.

If the user or administrator password is lost or forgotten, the password clear jumper can be used to clear both passwords. See Chapter 5 under “Clearing the Passwords with the Password Clear Jumper.”

If only the administrator password is set, you:

- Must enter the administrator password to enter BIOS Setup.
- Must enter the administrator password to boot the server if Password on Boot is enabled in the BIOS Setup.
- Must enter the administrator password to exit secure mode.

If both passwords are set, you:

- May enter the user password to enter BIOS Setup. However, you will not be able to change many of the options.
- Must enter the administrator password if you want to enter BIOS Setup and have access to all of the options.
- May enter either password to boot the server if Password on Boot is enabled in the BIOS Setup.
- May enter either password to exit secure mode.

## Setting Passwords

Each password can be independently set or cleared in the BIOS setup utility or in the System Setup Utility. The passwords can be up to seven characters long and can contain only alphanumeric characters (A-Z, 0-9). Numbers from the NumLock pad are recognized as different characters than the numbers in the top row of a standard PS/2 keyboard. The passwords are not case-sensitive.

When set, a password can be cleared by changing it to a null string.

## Intrusion Switch Monitoring

To help prevent unauthorized entry or use of the server, the Intel Server Management software monitors the chassis intrusion switch if one is installed in the chassis. Opening an access cover will transmit an alarm signal to the server board, where BMC firmware and server management software process the signal. The system can be configured through ISM to respond to an intrusion a number of ways, including powering down or locking the keyboard.

## Floppy Write Protection

When selected in Setup, the option for floppy write protection prevents writes to the floppy disk while the system is in secure mode. Floppy write protection is in effect only while the system is in secure mode. When not in secure mode, write protection is disabled and the floppy diskette drive operates normally.

## Fixed Disk Boot Sector Write Protect

The fixed disk write protect switch is set to “Write Protect” to prevent writes to the fixed IDE disk boot sector. This feature works only with IDE drives and only the boot sector is write protected.

## Power Switch Mask

The power switch mask enables and disables the power button feature. If it set to masked, the system power cannot be turned off with the power button after booting the operating system. Termination is also disabled. Termination is a feature that terminates system power when the power switch is held down for more than four seconds.

## Secure Mode

Configure and enable the secure boot mode by using the SSU. When secure mode is in effect:

- You can boot the server and the operating system will run, but you must enter the user password to use the keyboard or mouse.
- You cannot turn off system power or reset the server from the front panel switches.

Secure mode has no effect on functions enabled via the Server Manager Module or power control via the real time clock.

Taking the server out of secure mode does not change the state of system power. That is, if you press and release the power switch while secure mode is in effect, the system will not be powered off when secure mode is later removed. However, if the front panel power switch remains depressed when secure mode is removed, the server will be powered off.

## 2 Server Board Installations and Upgrades

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### Tools and Supplies Needed

- Phillips\* (cross head) screwdriver (#1 bit and #2 bit)
- Flat blade screwdriver
- Needle nosed pliers
- A ruler
- Pen or pencil
- Antistatic wrist strap and conductive foam pad (recommended)

### Before You Begin

#### Emissions Disclaimer

To ensure EMC compliance with your local regional rules and regulations, the final configuration of your end system product may require additional EMC compliance testing. For more information, please contact your local Intel Representative.

See “Regulatory and Integration Information” on page 129 for product Safety and EMC regulatory compliance information. This is an FCC Class A device. Integration of it into a Class B chassis does not result in a Class B device.

#### Safety Cautions

These warnings and cautions apply throughout this chapter. Only a technically qualified person should configure the server board.



#### CAUTIONS

**System power on/off:** The power button DOES NOT turn off the system AC power. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before you open the chassis, add, or remove any components.

**Hazardous conditions, devices & cables:** Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

**Electrostatic discharge (ESD) & ESD protection:** ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground—any unpainted metal surface—on your server when handling parts.

**ESD and handling boards:** Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

## Safety and Regulatory Compliance

See “Regulatory and Integration Information” on page 129 for product Safety and EMC regulatory compliance information.

***Intended uses:*** This product was evaluated for use in servers that will be installed in offices, computer rooms, and similar locations. Other uses require further evaluation.

***EMC testing:*** Before computer integration, make sure that the chassis, power supply, and other modules have passed EMC testing using a server board with a microprocessor from the same family (or higher) and operating at the same (or higher) speed as the microprocessor used on this server board.

***Server board diagram label provided:*** Place the label inside the chassis in an easy-to-see location, preferably oriented similarly to the server board.

# Minimum Hardware Requirements

To avoid integration difficulties and possible board damage, your system must meet the following minimum requirements. For more information on supported processors and qualified memory and chassis components, see:

<http://support.intel.com/support/motherboards/server/SE7501HG2>

## Processor

Minimum of one Intel Xeon processor with 512K cache. For a complete list of supported processors, see:

<http://support.intel.com/support/motherboards/server/SE7501HG2>

## Memory

Minimum of two 128 MB ECC, DDR266-compliant registered SDRAM 184-pin gold DIMMs.<sup>1</sup>

## Power Supply

Minimum of 450 W with 1.2 A +5 V standby current (in order to support Wake On LAN\* (WOL)) and 12+ V CPU power support [ATX], which meets the SSI EPS 12 V specification. You must provide standby current, or the board will not boot.

For more information on the SSI EPS 12 V specification, see:

<http://www.ssiforum.org>

# Installation Notes

## Installation Process Quick Reference

Step	Where the information is located
Remove the access cover	Your chassis manual
Install the I/O shield	Page 33
Install the standoffs	Page 35
Install the rubber bumper	Page 36
Install the server board	Page 36
Connect cables to the server board	Page 38. Refer also to your chassis manual
Install the processor and processor wind tunnel in the Intel® Server Chassis SC5200 base chassis or in a reference chassis	Page 39
Install the processor in the Intel® Server Chassis SC5200 with Hot Swap Redundant Power	Page 46
Install memory	Page 51

<sup>1</sup> DDR200 compliant registered ECC DIMMs can be used only if 400 MHz processors are installed.

# Installation Procedures

## Installing the I/O Gasket and Shield

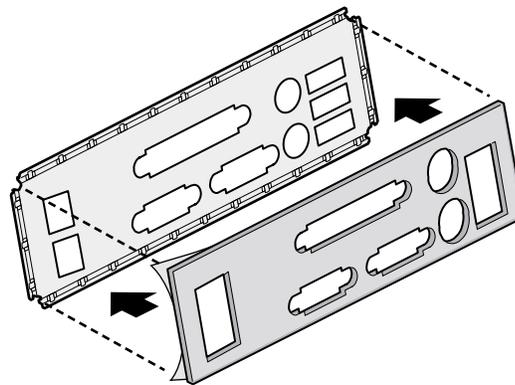
### ⇒ NOTE

An ATX 2.03-compliant I/O shield is provided with the server board. The shield is required by Electromagnetic Interference (EMI) regulations to minimize EMI. If the shield does not fit the chassis, obtain a properly sized shield from the chassis supplier.

The shield fits the rectangular opening in the back of a chassis. The shield has cutouts that match the I/O ports. Install the shield from inside the chassis.

### Attaching the Gasket to the I/O Shield

1. Remove the two backing strips from the gasket.
2. Press the gasket onto the inside face of the I/O shield as shown.

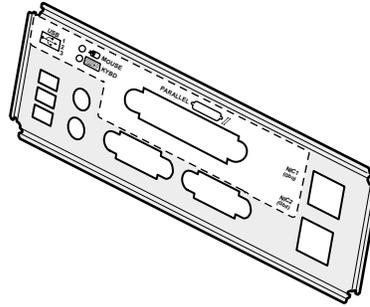


TP00028

**Figure 3. Attaching the Gasket to the I/O Shield**

## Attaching the Label to the I/O Shield

1. Remove the backing from the label included with your server board.
2. Press the label onto the outside face of the I/O shield.



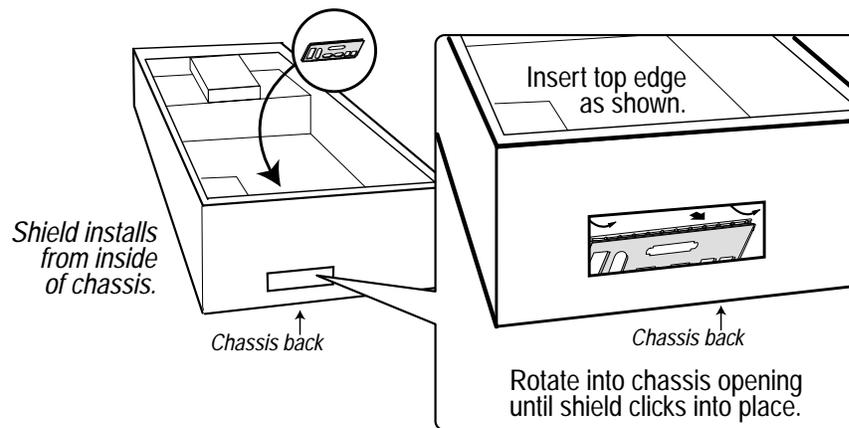
TP00029

**Figure 4. Attaching the Label to the I/O Shield**

## Installing the I/O Shield

The shield fits into the rectangular opening in the back of a chassis. It has cutouts that match the I/O ports on the server board. Install the shield from inside the chassis before installing the server board.

1. Position one edge so that the dotted groove is outside the chassis wall, and the lip of the shield rests on the inner chassis wall.
2. Hold the shield in place, and push it into the opening until it is seated. Make sure the I/O shield snaps into place all the way around.



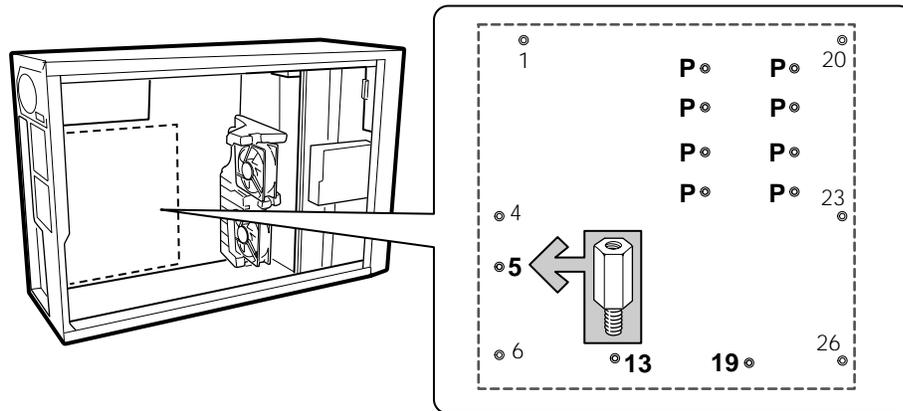
OM14625

**Figure 5. Installing the I/O Shield**

## Installing Chassis Standoffs

If your chassis does not have standoffs placed as shown below, you must rearrange them so they match the holes in the server board. Failure to properly rearrange the metal standoffs may cause the server board to malfunction and may permanently damage it. Your chassis may be different from the illustration.

For the Intel SC5200 chassis: Standoffs are included with your chassis. Install standoffs in positions 5, 13, 19, and in the eight positions marked P. Standoffs are included with your chassis. Standoff numbering in other chassis may be different.



TP00105

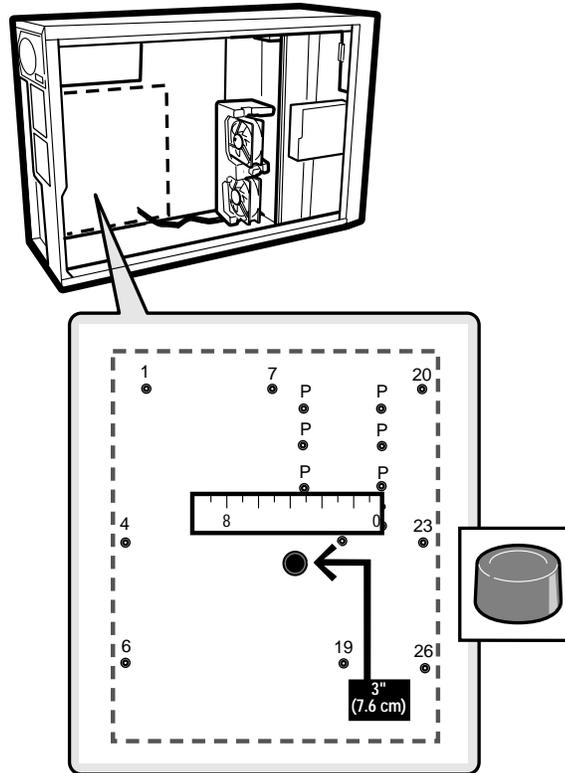
**Figure 6. Installing Chassis Standoffs**

### ⇒ NOTE

Install standoffs in the eight positions marked P, regardless of whether one or two processors will be installed.

## Installing the Rubber Bumper

1. Measure and mark the bumper placement location in your chassis by placing your ruler against the standoffs as shown below.
2. Remove the backing from the bumper and press it firmly into position in the chassis.

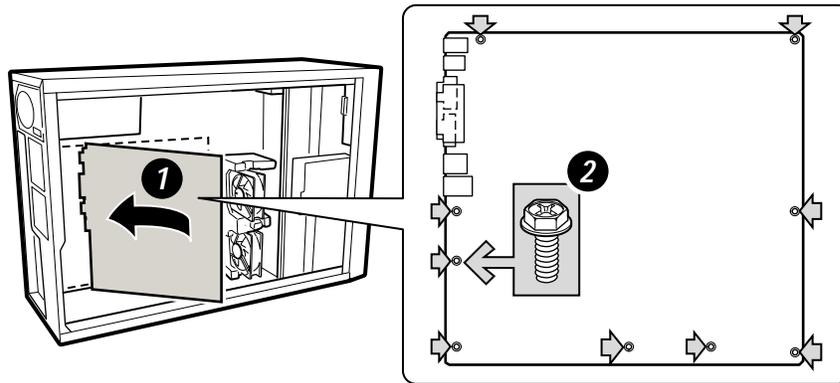


OM14835

Figure 7. Installing Rubber Bumper

## Installing the Server Board

1. Place the board into the chassis, making sure that the back panel I/O shield openings and chassis standoffs align correctly.
2. Attach the board using the screws that are included with your chassis. Attach fasteners at the nine locations marked below. For the Intel SC5200 chassis, these screws are packaged in a bag labeled “C.”



TP00106

**Figure 8. Placing the Server Board in the Chassis**

### ⇒ NOTE

If a single processor is to be used, insert screws into the four standoffs that border the CPU2 socket.

# Installing or Replacing Processor(s)

## ⇒ NOTES

Use the instructions provided below to install or replace a processor instead of using the instructions that came with the processor.

If a single processor is to be used, it must be installed in the processor socket labeled CPU1. This socket is located closest to the corner of the server board.

When installing a second processor, verify that the processors are identical and of the same voltage and speed. Do not mix processors of different types or frequencies.



## CAUTIONS

**Processor must be appropriate:** You may damage the server board if you install a processor that is inappropriate for your server. Make sure your server can handle a newer, faster processor (thermal and power considerations). For exact information about processor interchangeability, contact your customer service representative or visit the Intel Customer Support website:

*<http://support.intel.com/support/motherboards/server/SE7501HG2>*

**ESD and handling processors:** Reduce the risk of electrostatic discharge (ESD) damage to the processor by doing the following: (1) Touch the metal chassis before touching the processor or server board. Keep part of your body in contact with the metal chassis to dissipate the static charge while handling the processor. (2) Avoid moving around unnecessarily.

If you are adding a second processor to your system, you must verify that the second processor is identical to the first processor, same voltage and speed. Using non-identical processors could cause system failure.

**Use correct retention mechanism clips:** The 400 MHz and 533 MHz versions of the Intel Xeon processors use slightly different retention mechanism clips. The clips look nearly identical, but vary slightly in size. Use only the clips that came with your processor.

## Installing the Processor and the Processor Wind Tunnel in the SC5200 Base Chassis or in a Reference Chassis

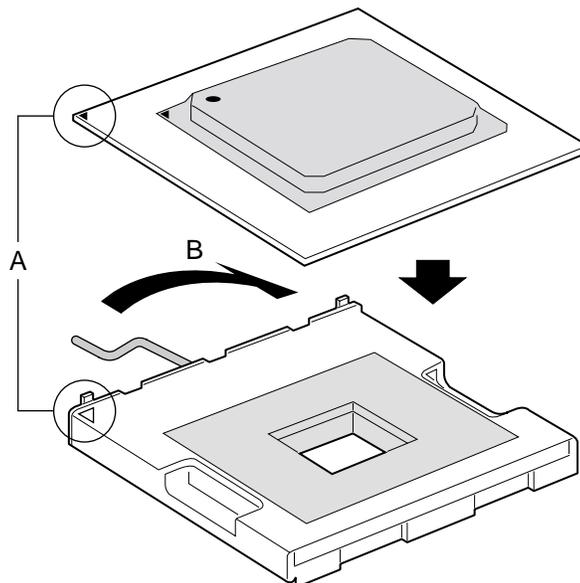
Use these instructions if you are installing a processor and the Processor Wind Tunnel (PWT) in the SC5200 base chassis or in a reference chassis. If you are installing the Server Board SE7501HG2 in the Intel® Server Chassis SC5200 Hot Swap Redundant Power, disregard this section and instead follow the instructions provided in the section titled, “Installing the Processor in the SC5200 Hot Swap Redundant Power Chassis” on page 46.

If you are replacing a processor for which the PWT has already been installed, follow the instructions provided on page 50 titled, “Replacing a Processor.”

1. Observe the safety and ESD precautions at the beginning of this chapter and the additional precautions given here.
2. Remove power from your system by unplugging the AC power cord.
3. Remove the chassis cover (see your system or chassis documentation for instructions).
4. Lift the socket lever for the processor.
5. Align the pins of the processor with the socket, and insert the processor into the socket. Lower the socket lever completely.

### ⇒ NOTE

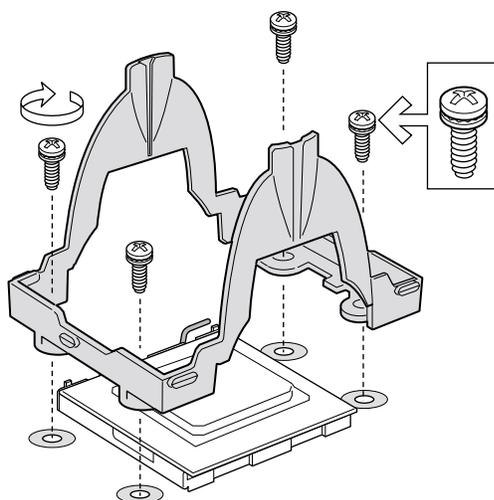
Make sure the alignment triangle mark and the alignment triangle cutout align correctly. See Figure 9.



OM15042

**Figure 9. Opening Socket Lever and Attaching Processor**

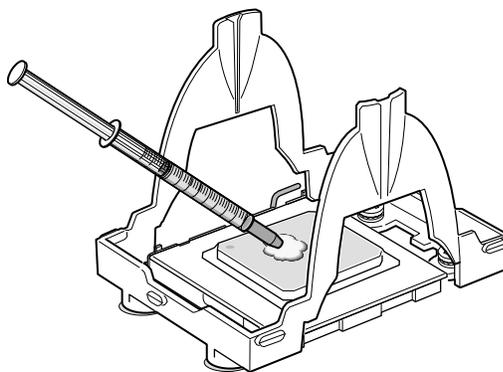
6. Install the PWT retention mechanism over the top of the processor with the screws provided, as shown in Figure 10.



OM15037

**Figure 10. Attaching Retention Mechanism**

7. Apply thermal grease to the processor as shown in Figure 11.



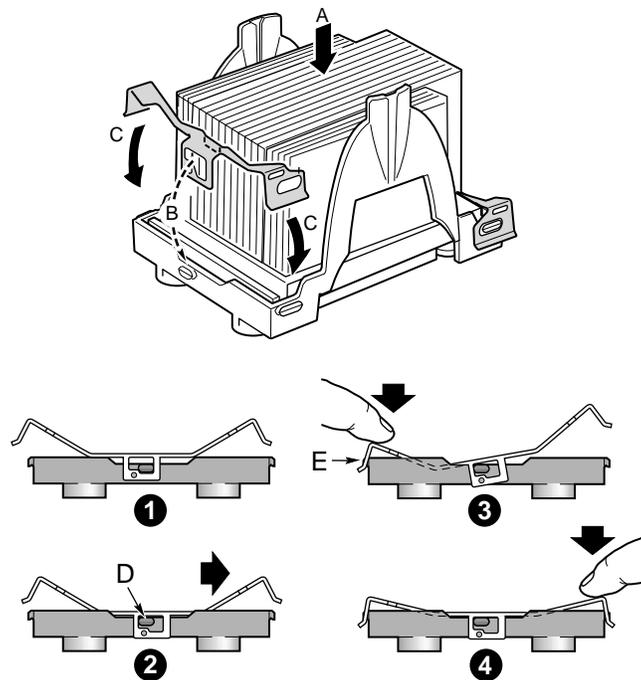
OM15040

**Figure 11. Applying Thermal Grease**

8. Align the heat sink over the processor and set it into place. If your heat sink has a flat end on it, as shown in the figure below, the flat end must point toward the rear of the chassis.
9. Position the retention clips over the plastic tabs at the center of the retention mechanism. Note that the slot in the clip provides room for side-to-side motion. Push down on the top of each retention clip while sliding it to over. (Figure 12, 1).
10. Engage each end of the retention clips over the plastic tabs at the sides of the retention mechanism (Figure 12, 2).
11. Press downward on the ends of the retention clips to lock them into place over the plastic tabs (Figure 12, 3 and 4).

⇒ **NOTE**

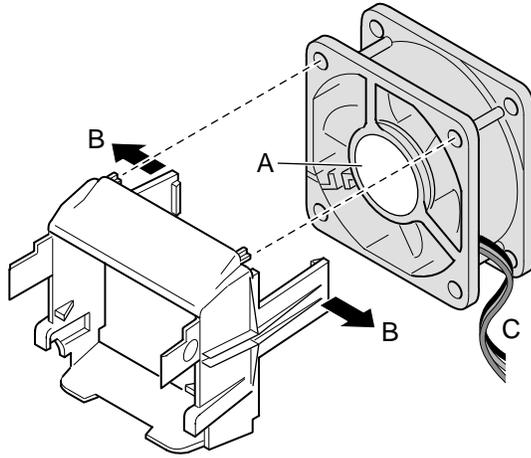
Make sure the center tab engages in the heat sink base.



TP00099

**Figure 12. Attaching the Heat Sink and Retention Clip**

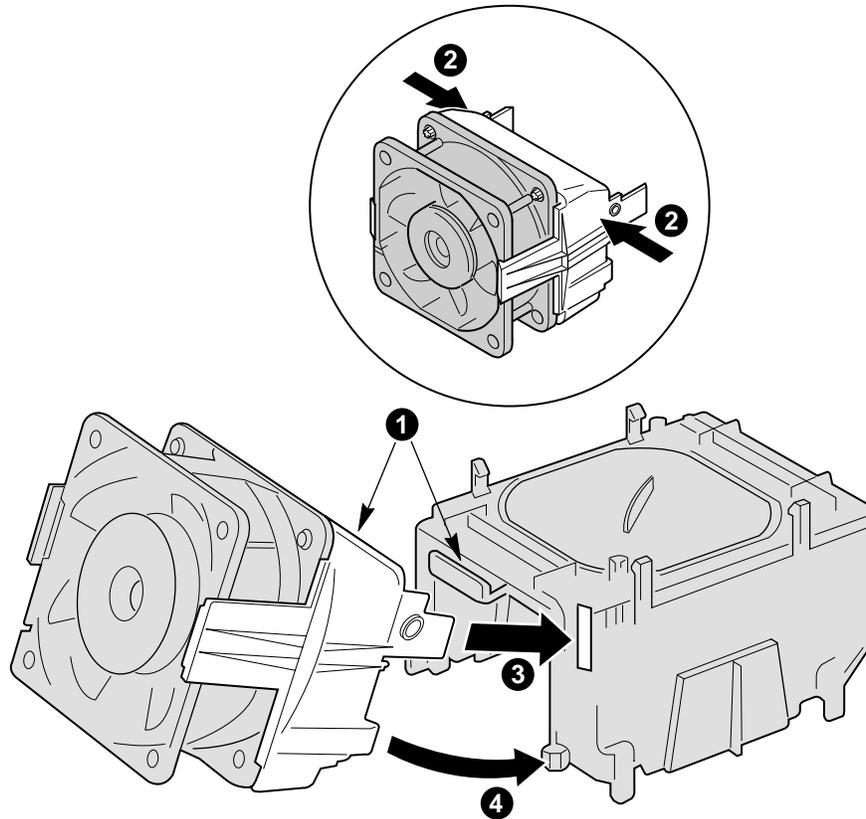
12. Attach the fan between the two large plastic tabs at each side of the fan assembly component of the PWT (Figure 13, B). To ensure that the airflow direction is correct, insert the fan so that the label shows through the assembled unit (Figure 13, A).



OM15041

**Figure 13. Attaching the Wind Tunnel Fan**

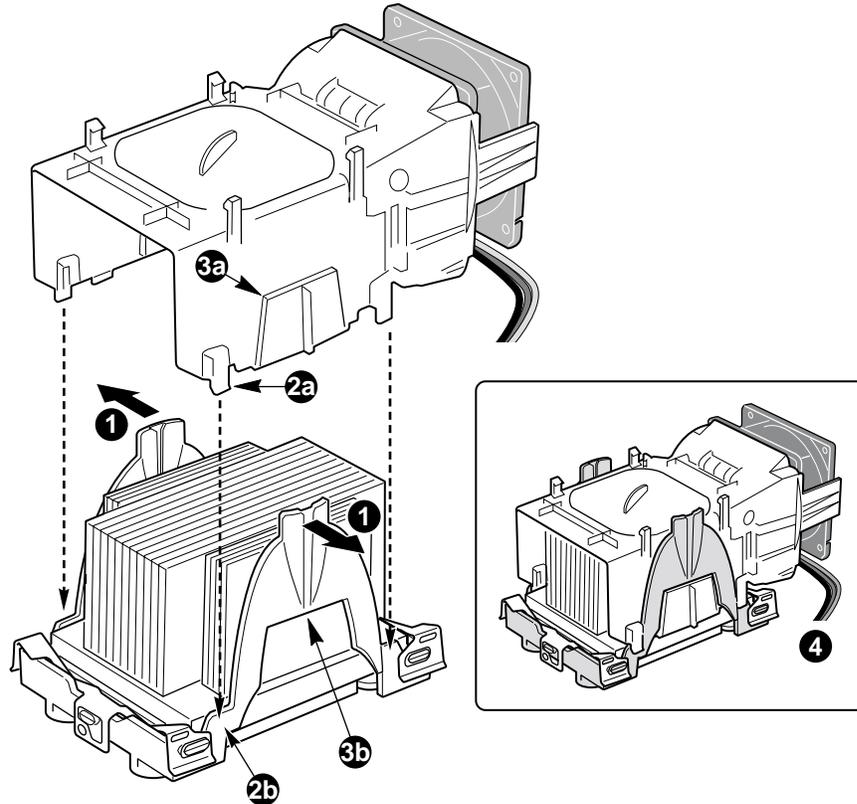
13. Attach the fan assembly to the top of the PWT. Position the fan assembly at approximately a 45° angle and engage the clip as shown in Figure 14, 1. Gently squeeze the tabs at the side of the fan assembly (Figure 14, 2) and insert them into the corresponding slots (Figure 14, 3). Rotate the fan assembly downward to engage the clips at the bottom (Figure 14, 4).



OM15044

**Figure 14. Attaching the Heat Sink Fan to the Top of the PWT**

14. Attach the fan assembly to the retention mechanism. Pull the tabs at the sides of the retention mechanism apart slightly. See Figure 15, 1. Lower the fan assembly into the retention mechanism. The tabs on the fan assembly (Figure 15, 3) will fit into the slots of the retention mechanism (Figure 15, 1). Pull out on the tabs located at the bottom of the fan assembly to snap them into place on the OUTSIDE of the retention mechanism (Figure 15, 2).
15. Attach CPU Fan 1 cable to the server board at location J7F1 and/or attach CPU Fan 2 cable at location J5F1. (Figure 15, 4.)



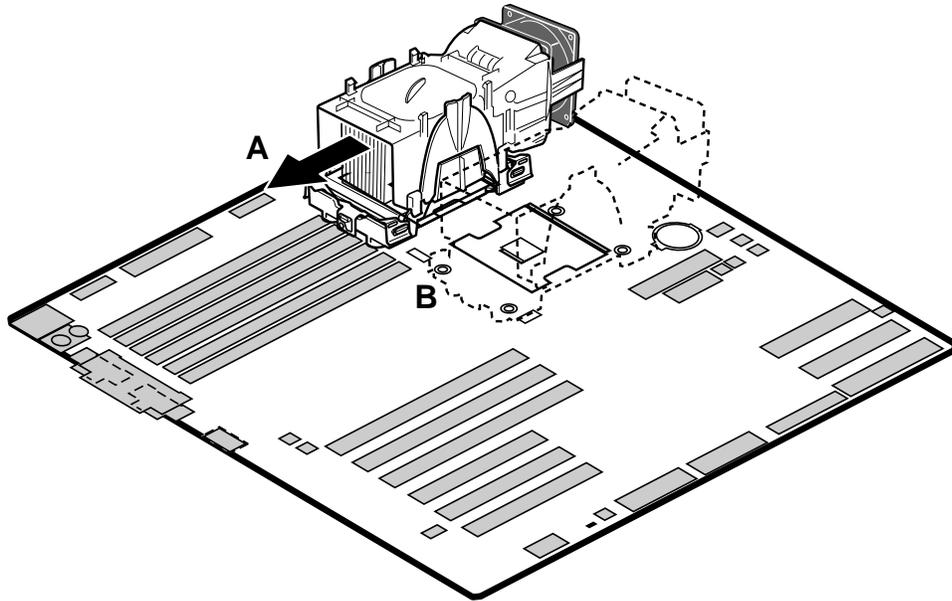
OM15045

**Figure 15. Attaching the Top Assembly to the Retention Mechanism**

⇒ **NOTE**

System airflow must be from front to back. Make sure the PWT is aligned so the fan is toward the front of the chassis and the airflow is toward the I/O shield. If two processors are installed, the fans will be side by side.

When assembled, the Processor Wind Tunnel will look similar to the figure below. The dashed lines over CPU2 (Figure 16, B) indicate that this processor assembly is only required when configuring the server with two processors. The direction of the airflow is indicated by the arrow at (Figure 16, A).



TP00016

**Figure 16. Processor and Wind Tunnel Installed**

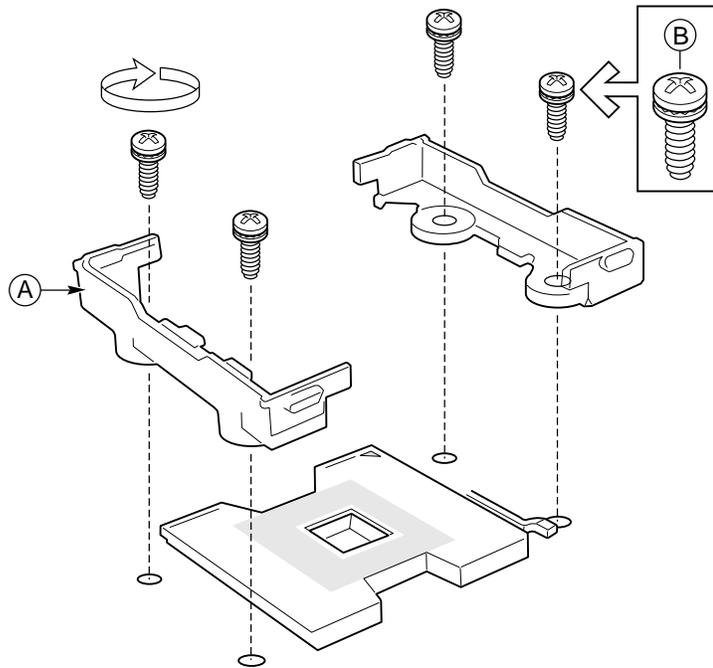
## Installing the Processor in the SC5200 Hot Swap Redundant Power Chassis

### ⇒ NOTE

Use these instructions if you are installing a processor in the Intel® Chassis SC5200 HSRP. When using this chassis, do not install the Processor Wind Tunnel. When installing the processor in the SC5200 Base chassis or in a reference chassis, disregard this section and follow the instructions in the section titled “Installing the Processor and the Processor Wind Tunnel in the SC5200 Base Chassis or in a Reference Chassis” on page 39.

Two sets of brackets included with each SC5200 HSRP chassis. For each bracket, do the following:

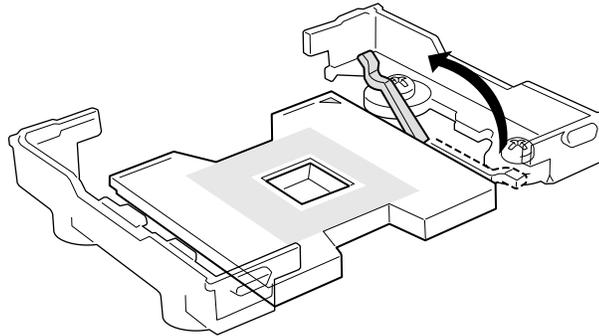
1. Place the bracket (letter A in the following diagram) on the server board.
2. Insert and tighten two screws (letter B in the diagram) to secure the bracket to the board.



OM14144

**Figure 17. Installing the Processor Retention Brackets**

3. Raise the locking bar on the processor socket.



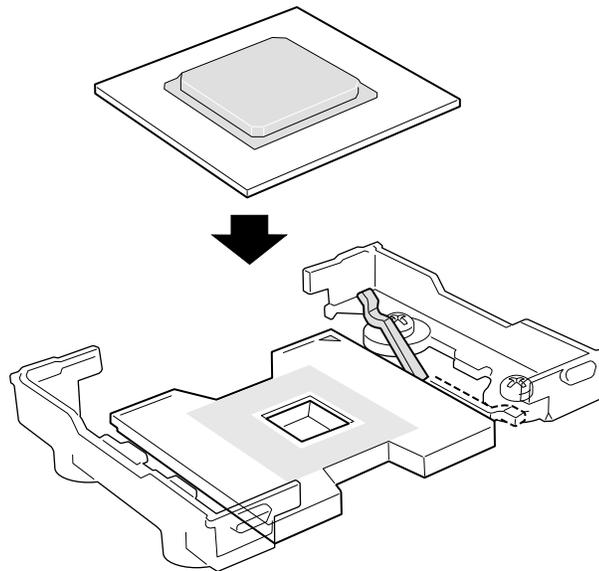
OM14132

**Figure 18. Raising the Locking Bar**

4. Aligning the pins of the processor with the socket, insert the processor into the socket.

⇒ **NOTE**

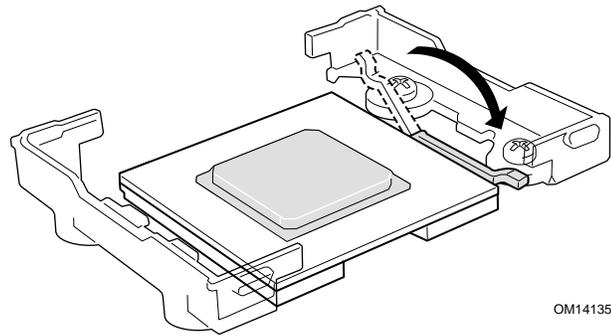
Make sure the alignment triangle mark and the alignment triangle cutout align correctly.



OM14133

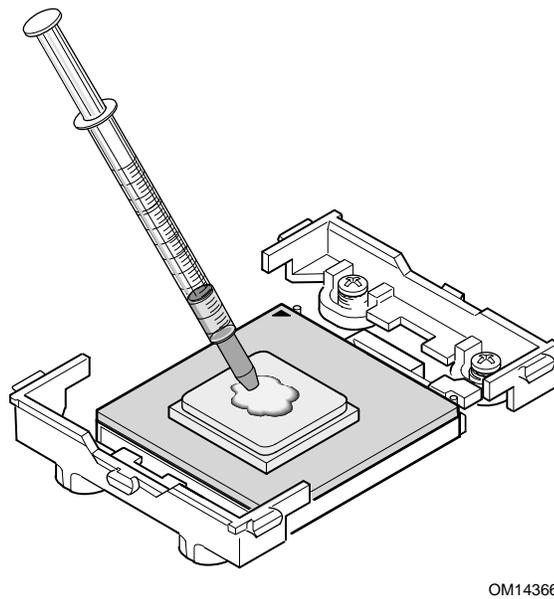
**Figure 19. Installing Processors**

5. Lower the locking bar completely.



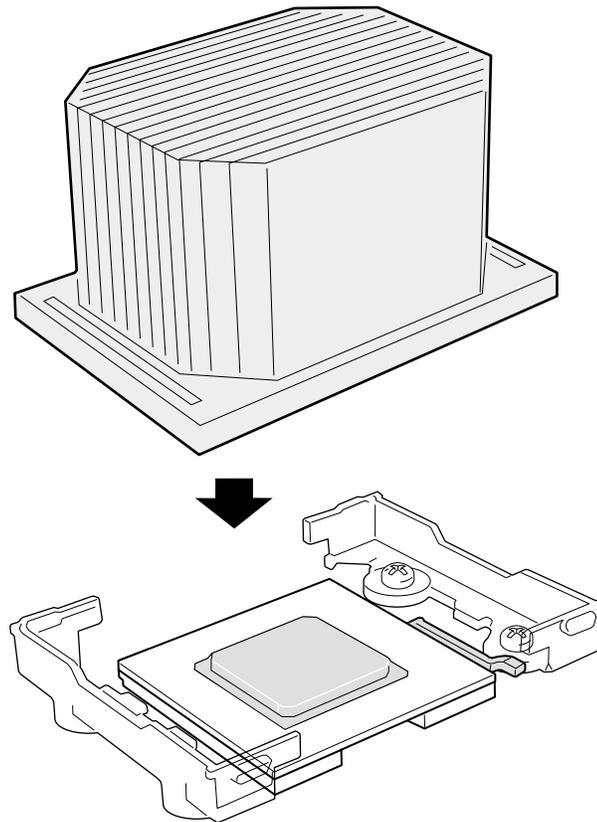
**Figure 20. Lower Locking Bar**

4. Apply thermal grease to the processor as shown.



**Figure 21. Applying Thermal Grease**

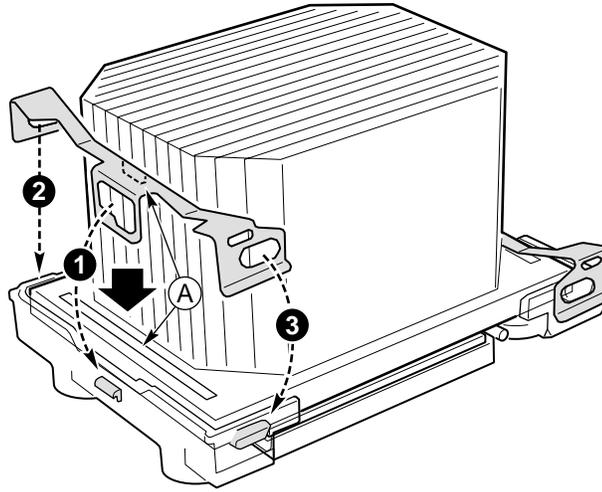
5. Position the heat sink above the processor
6. Aligning the raised metal surfaces, place the heat sink on top of the processor.



OM14134

**Figure 22. Installing the Heat Sink**

7. Place the heat sink clip (1) so the tab on the clip engages the slot on the heat sink (A).
8. Press one end of the clip down (2).
9. Press the other end of the clip down (3).



OM14140

**Figure 23. Installing the Heat Sink Clip**

## Replacing a Processor

1. Observe the safety and ESD precautions at the beginning of this chapter and the additional cautions given here.
2. Unplug the processor fan cable from the server board.
3. For a chassis in which a PWT assembly is used, detach the fan assembly from the PWT retention mechanism by unlatching the clips at the bottom of the fan assembly and then lifting up on the fan assembly.
4. Remove the metal retention clips from the bottom of the retention mechanism. Unhook each side of each clip and disengage the center latch.
5. Remove the heat sink by slightly spreading the sides of the retention mechanism and lifting straight up on the heat sink.
6. Raise the socket lever on the processor socket.
7. Remove the processor from the socket.
8. Align the pins of the replacement processor with the socket, and insert the processor into the socket. Lower the socket lever completely.

### ⇒ NOTE

Make sure the alignment triangle mark and the alignment triangle cutout align correctly.

9. Re-insert the heat sink over the top of the processor.
10. Reconnect the retention clips. See Figure 12.

## ⇒ NOTE

When the SC5200 Hot Swap Redundant Chassis is used, disregard steps 11 and 12.

11. For chassis that require the PWT assembly (SC5200 Base chassis and reference chassis), reattach the fan assembly to the retention mechanism. Pull the tabs at the sides of the retention mechanism apart slightly. See Figure 15, 1. Lower the fan assembly into the retention mechanism. The tabs on the fan assembly (Figure 15, 3) will fit into the slots of the retention mechanism.  
(Figure 15, 1). Pull out on the tabs located at the bottom of the fan assembly to snap them into place on the retention mechanism.
12. For chassis that require the PWT assembly, reattach the CPU fan.

## Installing Memory

The server board supports only DDR266-compliant DIMMs.<sup>2</sup> Install from 256 MB to 12 GB of memory, using up to six DIMMs.

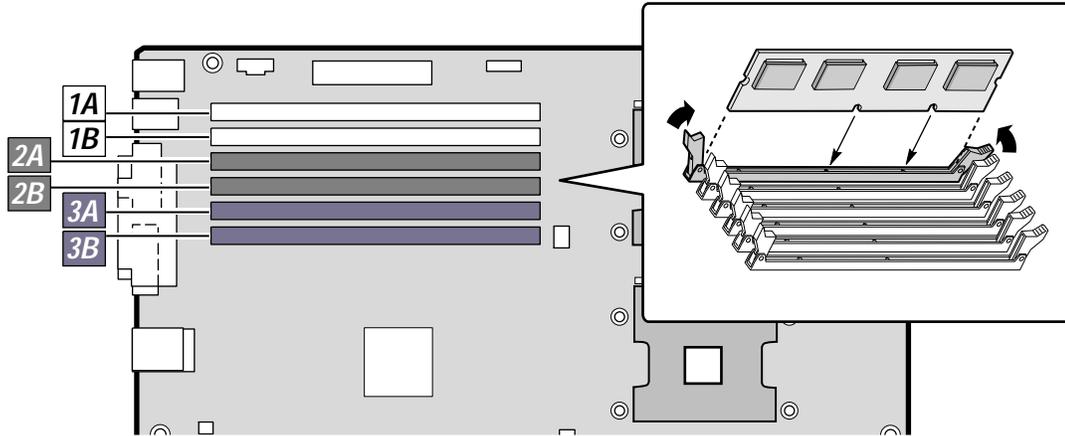
DIMMs must be installed in pairs. DIMM1, Bank 1 (the furthest DIMM pair from the MCH) must be populated first.

No DIMM mixing is allowed within a bank. Between banks only the DIMM size may be different. All DIMMs must be the same speed and architecture. For a list of supported memory, visit the Intel Support website: <http://support.intel.com/support/motherboards/server/SE7501HG2>

1. Open both DIMM socket levers.
2. Insert the DIMM, making sure the notches in connector edge of the DIMM align correctly with the key in the slot.
3. Push down on the top edge of the DIMM until the socket levers snap into place.
4. Check that socket levers are securely latched.

---

<sup>2</sup> DDR200 compliant registered ECC DIMMs can be used only if 400 MHz processors are installed.



TP00104

**Figure 24. Installing Memory**

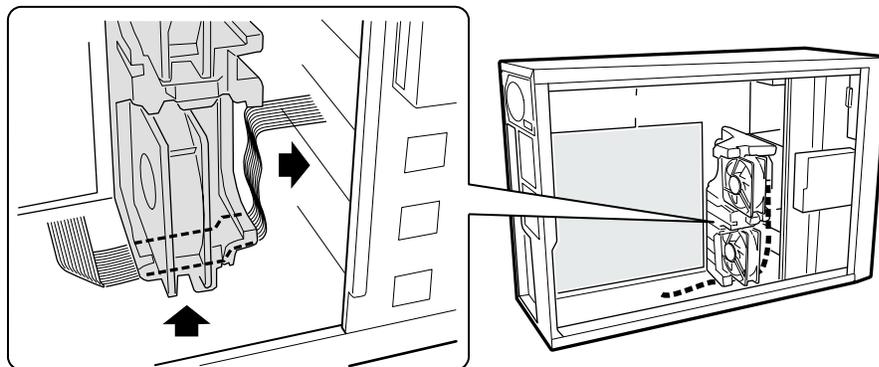
## Cable Routing for Intel SC5200 Base Chassis

To ensure proper air-flow within the chassis, follow the cable routing guidelines below.

### IDE or SCSI Cables

Cables that connect to devices in the lower device bays should be routed around the epac system fan carrier as shown below.

1. Route cables as shown.
2. Replace the top half of the epac.

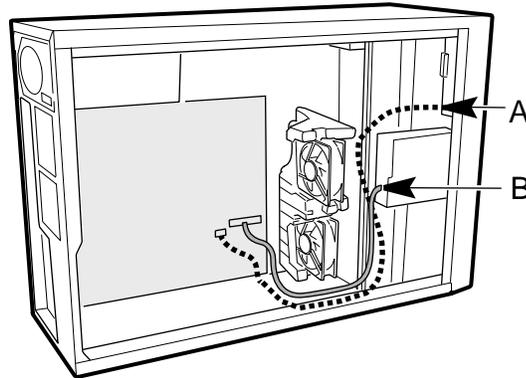


OM14556

**Figure 25. Routing Cables**

## Floppy and Front Panel Cables

Route the floppy drive and front panel cables as shown.



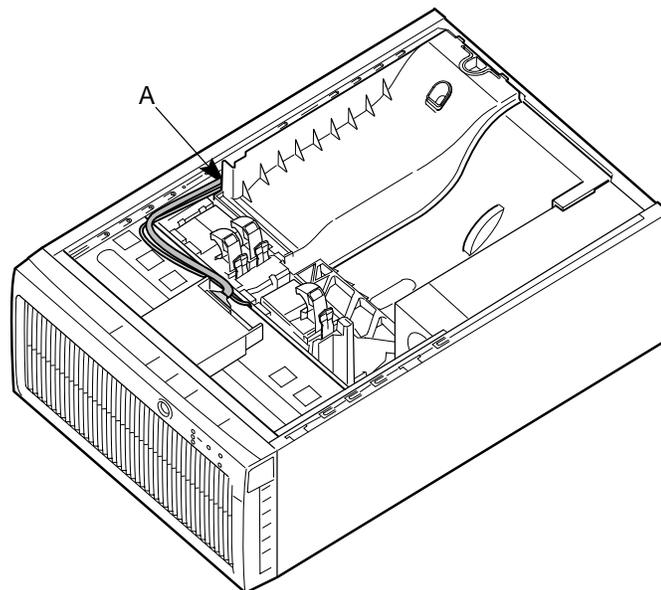
OM14376

- A. Front Panel Cable
- B. Floppy Diskette Cable

**Figure 26. Routing the Floppy and Front Panel Cables**

## Cable Routing for Intel SC5200 Hot-Swap, Redundant Power Chassis

Route the floppy drive cable and the hot-swap drive bay ICMB cable between the chassis wall and the hot-swap fan holder as shown below at location A.

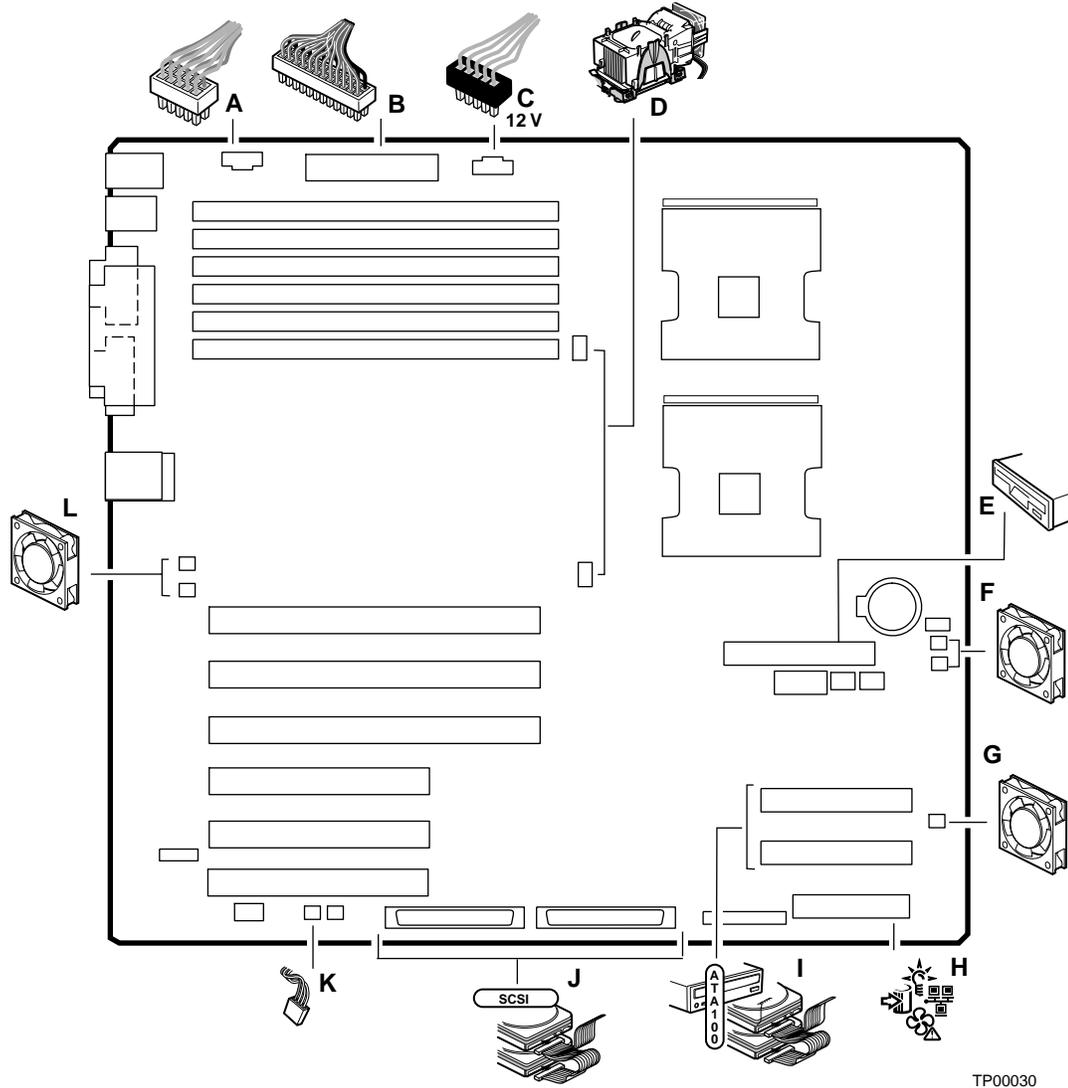


OM14377

- A. Cable Routing Location

**Figure 27. Routing the Floppy and ICMB Cables**

# Making Connections to the Server Board



TP00030

- |   |  |   |  |
|---|--|---|--|
| A | Aux Power                                    | G | System Fan 3                                     |
| B | Main Power                                   | H | Front Panel Connector                            |
| C | +12 V CPU Power                              | I | Primary IDE (top),<br>Secondary IDE (bottom)     |
| D | CPU1 Fan (top), CPU2 fan (bottom)            | J | SCSI Channel A (left),<br>SCSI Channel B (right) |
| E | Floppy Disk Drive Connector                  | K | Chassis Intrusion                                |
| F | System Fan 5 (top),<br>System Fan 4 (bottom) | L | System Fan 1 (top),<br>System Fan 2 (bottom)     |

**Figure 28. Making Connections to the Server Board**

## Intel® SC5200 Base Server Chassis Note

Connect front system fans to the System Fan 3 and System Fan 5 connectors on the server board.

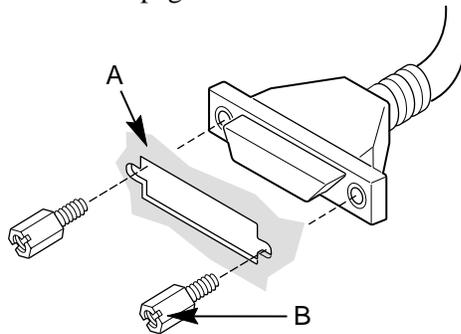
## Intel SC5200 Hot-Swap, Redundant Power Server Chassis Note

Be sure to attach system fans to their correspondingly numbered connector on the server board. System fan numbers can be found on the system fan carrier and on the system fan cables.

## Installing the Serial B Cable

For the Intel SC5200 chassis, you can connect the Serial B serial port cable to either the front (rack configuration only) or back panels. Connecting it to the back panel is illustrated below.

1. Install the Serial B cable by inserting it into the chassis back panel cutout and attaching it as shown.
2. Attach the other end to the Serial B connector located on your server baseboard. See “Making Connections to the Server Board” on page 38 for the Serial B connector location.



OM14557

- A. Chassis Back Panel Cutout
- B. Screw

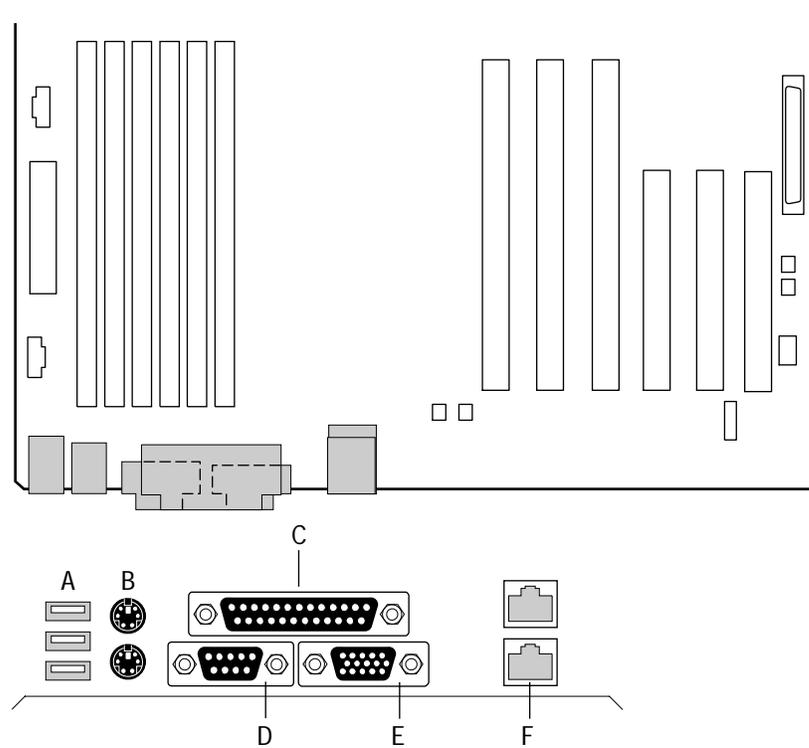
**Figure 29. Installing the Serial B Cable**

## Finishing Up

### **WARNING**

**An electrical shock hazard exists if the chassis cover is not replaced before connecting the chassis AC power.**

1. Install the chassis cover according to the instructions for your chassis.
2. See your chassis documentation to complete rack or pedestal installation.
3. Connect the keyboard, mouse and monitor cables to the back panel.
4. Connect the power cable to the back panel and to an AC outlet.



TP00031

- A USB 1, 2, 3
- B Keyboard, Mouse
- C Parallel Port
- D Serial A Port
- E Video
- F NICs (gigabit)  
NIC2 top  
NIC1 bottom

**Figure 30. Making Back Panel Connections**

# Replacing the Backup Battery

The lithium battery on the server board powers the RTC for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.



## **WARNING**

**Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.**



## **ADVARSEL!**

**Lithiumbatteri - Eksplosjonsfare ved fejløgt håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.**



## **ADVARSEL**

**Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.**



## **WARNING**

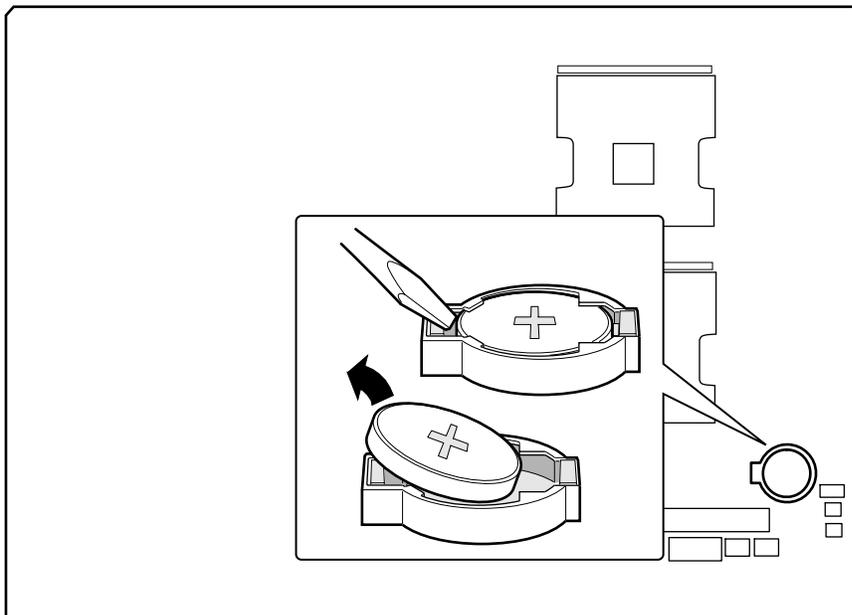
**Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.**



## **VAROITUS**

**Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.**

1. Observe the safety and ESD precautions at the beginning of this chapter.
2. Open the chassis.
3. Insert the tip of a small flat-blade screwdriver, or equivalent, under the tab in the plastic retainer. Gently push down on the screwdriver to lift the battery.
4. Remove the battery from its socket.
5. Dispose of the battery according to local ordinance.
6. Remove the new lithium battery from its package, and, being careful to observe the correct polarity, insert it in the battery socket.
7. Close the chassis.
8. Run BIOS Setup to restore the configuration settings to the RTC.



TP00036

**Figure 31. Replacing the Back up Battery**





## 3 POST and the BIOS Setup Utility

---

This chapter describes the Power-On Self Test (POST) and the BIOS Setup utility.

### Power-On Self-Test (POST)

Each time you turn on the system, the BIOS begins executing the Power-On Self-Test (POST), which is stored in flash memory. POST discovers, configures, and tests the processors, memory, keyboard, and most installed peripheral devices. During the memory test, POST displays the amount of memory that it is able to access and test. The time needed to test memory depends on the amount of memory installed.

1. Turn on your server and monitor. After a few seconds, POST begins to run and displays a splash screen.
2. While the splash screen is displayed:
  - Press <F2> to enter the BIOS Setup
  - OR
  - Press <Esc> to view POST diagnostic messages and change the boot device priority for this boot only (see “Temporarily Changing the BIOS Boot Priority” below).
3. If you do not press <F2> or <Esc> and do NOT have a device with an operating system loaded, the boot process continues and the system beeps once. The following message is displayed:  
Operating System not found
4. Press <Ctrl+A> if there are SCSI devices installed. When the utility opens, follow the displayed instructions to configure the onboard SCSI host adapter settings and to run the SCSI utilities. Also see “Using the Adaptec SCSI Utility” on page 81. If you do not enter the SCSI utility, the boot process continues.
5. Press <Esc> during POST to pop up a boot menu when POST finishes. From this menu you can choose the boot device or enter BIOS Setup.

What appears on the screen after this depends on whether you have an operating system loaded and if so, which one.

If the system halts before POST completes running, it emits a beep code indicating a fatal system error that requires immediate attention. If POST can display a message on the video display screen, it causes the speaker to beep twice as the message appears.

Write down both the screen display and the beep code you hear; this information is useful for your service representative. For a listing of common beep codes and error messages that POST can generate, see the “Solving Problems” chapter in this manual.

## Temporarily Changing the Boot Device Priority

During POST, you can change the boot device priority for the current boot process. The changes are not saved for the next boot process.

1. Boot the server.
2. At any time during POST, press <Esc>. When POST completes, a popup Boot menu displays.
3. Use the arrow keys to highlight the device you want the server system to boot from first. For example, if you want the server system to boot from the CD-ROM first, you select “ATAPI CD-ROM Drive.”

### ⇒ NOTE

One of the selections on the popup Boot menu is “Enter Setup.” Selecting this option brings you into the BIOS Setup.

4. Press <Enter> and the boot process continues.

## Using BIOS Setup

This section describes the BIOS Setup options. Use Setup to change the server configuration defaults. You can run Setup with or without an operating system being present. Setup stores most of the configuration values in battery backed CMOS; the rest of the values are stored in flash memory. The values take effect when you boot the server. POST uses these values to configure the hardware; if the values and the actual hardware do not agree, POST generates an error message. You must then run Setup to specify the correct configuration.

## Record Your Setup Settings

Record your BIOS setup settings. If the default values ever need to be restored (after a CMOS clear, for example), you must run Setup again. Your record will make this task easier.

## If BIOS Setup Is Inaccessible

If you are not able to access BIOS Setup, you might need to clear the CMOS memory. To clear CMOS, either of two methods can be used:

- Press the reset button and hold it down for four seconds or more, and then, while holding the reset button down, press the power button. Release both buttons at the same time  
OR
- Move the Clear CMOS jumper found on the configuration jumper block on the baseboard.

## Starting Setup

You can enter and start Setup under several conditions:

- When you turn on the server, after POST completes the memory test
- When you reboot the server by pressing <Ctrl+Alt+Del> while at the DOS operating system prompt
- When you have moved the CMOS jumper on the server board to the “Clear CMOS” position (enabled); for the procedure, see Chapter 5 on Page 127.

In the three conditions listed above, after rebooting, you will see this prompt:

```
Press <F2> to enter SETUP
```

### ⇒ NOTE

If the BIOS setup option “POST Diagnostic Screen” is enabled (Default), you will not see the message “Press <F2> to enter SETUP.” This message is hidden by the Manufacturer’s Splash screen. To see the message, press the <ESC> key while the splash screen is displayed. This will temporarily disable the splash screen allowing you to see the message.

In a fourth condition, when CMOS/NVRAM has been corrupted, you will see other messages but not the <F2> prompt:

```
Warning: CMOS checksum invalid
Warning: CMOS time and date not set
```

In this condition, the BIOS will load default values for CMOS and attempt to boot.

## Setup Menu

Each Setup menu page contains a number of features. Except those used for information purposes, each feature is associated with a value field that contains user-selectable parameters. Parameters may be changed depending upon the security option chosen. If a value is not changeable due to insufficient security privileges (or other reasons), the feature’s value field becomes inaccessible.

The bottom portion of the Setup screen provides a list of commands that are used for navigating the Setup utility.

**Table 5. Keyboard Commands**

Press	Description
<F1>	Help - Pressing F1 on any menu invokes the general Help window.
← →	The left and right arrow keys are used to move between the major menu pages. The keys have no affect if a submenu or pick list is displayed.
↑	Select Item up - The up arrow is used to select the previous value in a menu item's option list, or a value field pick list. Pressing the Enter key activates the selected item.
↓	Select Item down - The down arrow is used to select the next value in a menu item's option list, or a value field pick list. Pressing the Enter key activates the selected item.
F5/-	Change Value - The minus key or the F5 function key 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.
F6/+	Change Value - The plus key or the F6 function key 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 than the plus key on the other keyboard, but it has the same effect.
<Enter>	Execute Command - The Enter key is used to activate submenus when the selected feature is a submenu, or to display a pick list if a selected feature 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 - 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. When the ESC key is pressed in any submenu, 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.
<F9>	Setup Defaults - Pressing F9 causes the following to appear: <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">Setup Confirmation</p> <hr/> <p style="text-align: center;">Load default configuration now?</p> <p style="text-align: center;">[Yes] [No]</p> </div> <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, the user is returned to where they were before F9 was pressed without affecting any existing field values.</p>
<F10>	Save and Exit - Pressing F10 causes the following message to appear: <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">Setup Confirmation</p> <hr/> <p style="text-align: center;">Save Configuration changes and exit now?</p> <p style="text-align: center;">[Yes] [No]</p> </div> <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, the user is returned to where they were before F10 was pressed without affecting any existing values.</p>

**Table 6. On-Screen Options**

When you see this:	What it means:
On screen, an option is shown but you cannot select it or move to that field.	You cannot change or configure the option in that menu screen. Either the option is auto-configured or auto-detected, or you must use a different Setup screen.
On screen, the phrase Press Enter appears next to the option.	Press <Enter> to display a submenu that is either a separate full screen menu or a popup menu with one or more choices.

## Menu Selection Bar

The Menu Selection Bar is located at the top of the screen and displays the major menu selections available to the user.

**Table 7. Menu Selection Bar**

Main	Advanced	Security	Server	Boot	Exit
Allocates resources for hardware components	Configures advanced features available through the chipset	Sets and clears passwords and security features	Information on Vendor, Processor, Memory, Peripherals, and BIOS	Selects boot options and power supply controls	Saves or discards changes to Setup program options

## Main Menu

You can make the following selections from the Main Menu. Use the submenus for other selections.

**Table 8. Main Menu Selections**

Feature	Choices	Description
System Time	HH:MM:SS	Sets the system time (hour, minutes, seconds, on 24 hour clock).
System Date	MM/DD/YYYY	Sets the system date (month, day, year).
Floppy A	Not installed <b>1.44/1.25 MB, 3.5-inch</b> 2.88 MB	Selects the diskette type.
Hard Disk Pre-delay	<b>Disabled</b> 3 seconds 6 seconds 9 seconds 12 seconds 15 seconds 21 seconds 30 seconds	Provides time to allow drives that spin-up slower to become ready.
Primary IDE Master	<Enter>	Displays the IDE device selection. Enters submenu.
Primary IDE Slave	<Enter>	Displays IDE device selection. Enters submenu.
Secondary IDE Master	<Enter>	Displays IDE device selection. Enters submenu.
Secondary IDE Slave	<Enter>	Displays IDE device selection. Enters submenu.
Processor Settings	<Enter>	Enters submenu.
Language	<b>English (US)</b> Spanish Italian French German	Selects the language displayed by the BIOS. When English (US) or one of the other Latin-based languages is selected, the full 8-bit ASCII character will be redirected in the format selected under the serial console redirection submenu.

**Table 9. Primary/Secondary, Master/Slave Submenu**

Feature	Choices	Description
Type	None <b>Auto</b>	Auto instructs the system to automatically detect the drive type. None instructs the system to ignore this drive.
LBA Mode Control	<b>Disabled</b> Enabled	This field is informational only. It is disabled if no devices are detected.
Multi-Sector Transfer	<b>Disabled</b> 2 Sectors 4 Sectors 8 Sectors 16 Sectors	This field is informational only and can be seen only if an IDE hard disk drive is detected. This field specifies the number of sectors that are transferred per block during multiple sector transfers.
PIO Mode	Standard 1 2 3 3 / DMA 1 4 4 / DMA 2	This field is informational only. It displays the method of moving data to and from the hard drive.
Ultra DMA Mode	Mode 2 Mode 4	This field is informational only. It displays the method of moving data to and from the hard drive.

**Table 10. Processor Settings Submenu**

Feature	Choices	Description
Processor POST Speed	Information Only	Displays the measured processor speed.
Processor Retest	Enabled <b>Disabled</b>	When enabled, the BIOS will clear the processor status history and retest all processors at the next boot. This option automatically reverts to Disabled upon booting.
Hyper-Threading Support	<b>Enabled</b> Disabled	When disabled, hyper-threading is disabled.
Processor 1 CPUID	Information Only	Reports the CPU ID for processor 1.
Processor 1 L2 Cache Size	Information Only	Reports the L2 cache size for processor 1.
Processor 2 CPUID	Information Only	Reports the CPU ID for processor 2.
Processor 2 L2 Cache Size	Information Only	Reports the L2 cache size for processor 2.

## Advanced Menu

You can make the following selections on the Advanced Menu.

**Table 11. Advanced Menu**

Feature	Choices	Description
PCI Configuration	<Enter>	Enters submenu.
Peripheral Configuration	<Enter>	Enters submenu.
Memory Configuration	<Enter>	Enters submenu.
Advanced Chipset Control	<Enter>	Enters submenu. This option will not be available if there are no advanced chipset settings that can be controlled by the user.
Boot-time Diag Screen	Enabled <b>Disabled</b>	When enabled, the system displays the normal POST messages. When disabled, the logo screen is displayed. Disabling this option disables serial redirection.  This option is not displayed if the BIOS does not detect a valid logo in the flash file.
Reset Configuration Data	<b>No</b> Yes	Select Yes if you want to clear the server configuration data during the next boot. The system automatically resets this field to No during the next boot.
Numlock	On <b>Off</b>	Selects the state of the Numlock key at system power-on.
Sleep Button	<b>Enabled</b> Disabled	When disabled, the sleep button will be disabled.

**Table 12. PCI Configuration Submenu**

Feature	Choices	Description
USB Function	<Enter>	Enters submenu.
On-board NIC	<Enter>	Enters submenu.
On-board SCSI	<Enter>	Enters submenu.
On-board Video	<Enter>	Enters submenu.
PCI Slot 1 ROM	<b>Enabled</b> Disabled	Enables or disables the option ROM scan of the device in the selected 64-bit, 133 MHz PCI-X slot.
PCI Slot 2 ROM	<b>Enabled</b> Disabled	Enables or disables the option ROM scan of the device in the selected 64-bit, 100 MHz PCI-X slot.
PCI Slot 3 ROM	<b>Enabled</b> Disabled	Enables or disables the option ROM scan of the device in the selected 64-bit, 100 MHz PCI-X slot.
PCI Slot 4 ROM	<b>Enabled</b> Disabled	Enables or disables the option ROM scan of the device in the selected 32-bit, 33 MHz PCI slot.
PCI Slot 5 ROM	<b>Enabled</b> Disabled	Enables or disables the option ROM scan of the device in the selected 32-bit, 33 MHz PCI slot.
PCI Slot 6 ROM	<b>Enabled</b> Disabled	Enables or disables the option ROM scan of the device in the selected 32-bit, 33 MHz PCI slot.

**Table 13. PCI Configuration, Embedded Devices Submenu**

Feature	Choices	Description
USB Function	<b>Enabled</b> Disabled	When disabled, the USB controller is disabled and the device resources are hidden from the system.
On-board NIC	<b>Enabled</b> Disabled	When disabled, the embedded NIC is disabled and the device resources are hidden from the system.
On-board NIC ROM	<b>Enabled</b> Disabled	When enabled, the NIC expansion ROM is initialized.
On-board SCSI	<b>Enabled</b> Disabled	When disabled, the embedded SCSI device is disabled and the device resources are hidden from the system.
On-board SCSI ROM	<b>Enabled</b> Disabled	When enabled, the SCSI device expansion ROM is initialized.
On-board Video	<b>Enabled</b> Disabled	When disabled, the embedded video is disabled and the device resources are hidden from the system.

**Table 14. Peripheral Configuration Submenu**

Feature	Choices	Description
Serial Port A Address	Disabled <b>3F8h</b> 2F8h 3E8h 2E8h	Disables Serial Port A or selects the base I/O address for the port. <b>NOTE:</b> No two devices can share the same IRQ or I/O address. Choosing Disabled makes this port unusable.
Serial Port A IRQ	<b>4</b> 3	Selects the IRQ for Serial Port A.
Serial Port B Address	Disabled 3F8h <b>2F8h</b> 3E8h 2E8h	Disables Serial Port B or selects the base I/O address for the port. <b>NOTE:</b> No two devices can share the same IRQ or I/O address. Choosing Disabled makes this port unusable.
Serial Port B IRQ	<b>4</b> <b>3</b>	Selects the IRQ for Serial Port B.
Parallel Port Address	Disabled <b>378h</b> 278h 2BCh	Disables the onboard parallel port or selects the base I/O address for the port. <b>NOTE:</b> Two devices cannot share the same IRQ. Also, choosing Disabled makes the parallel port unusable.
Parallel Port IRQ	<b>5</b> <b>7</b>	Selects the IRQ for the parallel port.

continued

**Table 14. Peripheral Configuration Submenu** (continued)

Parallel Port Mode	Normal Bi-directional EPP <b>ECP</b>	<b>Parallel Port Modes:</b> <b>Normal</b> – Output only. The standard printer connection. <b>Bi-directional</b> – Standard bi-directional mode. <b>Enhanced parallel port (EPP)</b> – Selection based on which EPP version the printer supports. Only choose a mode that the parallel port device (such as a printer) supports. Check the parallel port device documentation for this information. If this information cannot be located, use the default setting. <b>Extended capabilities port (ECP)</b> – Select only if the printer supports it. ECP uses hardware to generate handshaking signals, similar to EPP. However, it uses DMA channels to move data, a FIFO buffer to send and receive data, and real-time data compression.
ECP Mode DMA Channel	0 1 2 <b>3</b>	Selects the DMA channel for ECP mode.
Diskette Controller	<b>Enabled</b> Disabled	Enables or disables the diskette controller in the Super I/O.
Legacy USB Support	Disabled Keyboard only <b>Auto</b> Keyboard and Mouse	If disabled, legacy USB support is turned off at the end of BIOS POST.
Front Panel USB	<b>Enabled</b> Disabled	If disabled, the front panel USB ports are inactive.

**Table 15. Memory Configuration Submenu**

Feature	Choices or Display Only	Description
Extended Memory Test	1 MB 1 KB Every Location <b>Disabled</b>	Selects the size of step to use during the extended RAM tests. When disabled is selected, extended memory tests are not run. The Every Location selection will increase the boot time.
Memory Bank #1 (DIMM 1A and 1B)	Installed <b>Not Installed</b> Disabled	Displays the current status of Memory Bank 1. Disabled indicates that a DIMM in the bank has failed and the entire bank has been disabled.
Memory Bank #2 (DIMM 2A and 2B)	Installed <b>Not Installed</b> Disabled	Displays the current status of Memory Bank 2. Disabled indicates that a DIMM in the bank has failed and the entire bank has been disabled.
Memory Bank #3 (DIMM 3A and 3B)	Installed <b>Not Installed</b> Disabled	Displays the current status of Memory Bank 2. Disabled indicates that a DIMM in the bank has failed and the entire bank has been disabled.
Memory Retest	Enabled <b>Disabled</b>	When enabled is selected, the BIOS retests all memory on the next boot. This option automatically reverts to disabled upon booting.

**Table 16. Advanced Chipset Control Submenu**

Feature	Choices or Display Only	Description
Wake On Ring	Enabled <b>Disabled</b>	Controls legacy wake-up source
Wake On LAN	Enabled <b>Disabled</b>	Controls legacy wake-up source
Wake On PME	Enabled <b>Disabled</b>	Controls legacy wake-up source
Wake On RTC Alarm	Enabled <b>Disabled</b>	Controls legacy wake-up source

## Security Menu

You can make the following selections from the Security Menu. Enabling the Administrator Password field requires a password for entering Setup. Passwords are not case-sensitive.

**Table 17. Security Menu**

Feature	Choices	Description
User Password is	<b>Not Installed</b> Installed	Information only; once the password is set, it can be disabled by selecting the Set Administrative Password and then setting the password to a null string, or by using the clear password jumper on the board. <b>NOTE:</b> The clear password jumper clears both the Administrator and User passwords.
Administrator Password is	<b>Not Installed</b> Installed	Information only; once the password is set, it can be disabled by selecting the Set Administrative Password and then setting the password to a null string, or by using the clear password jumper on the board. <b>NOTE:</b> The clear password jumper clears both the Administrator and User passwords.
Set Administrative Password	<Enter>	When the <Enter> key is pressed, you are prompted for a password; press the ESC key to abort. Once set, the password can be disabled by setting the password to a null string, or by using the clear password jumper. <b>NOTE:</b> If the clear password jumper is used, both the User and Administrative passwords will be cleared. Entering Setup with the Administrative Password provides full access to all BIOS Setup utility menus.
Set User Password	<Enter>	This option is available only if an Administrator Password is configured. When the <Enter> key is pressed, you are prompted for a password; press the ESC key to abort. Once set, the password can be disabled by setting the password to a null string, or by using the clear password jumper. <b>NOTE:</b> If the clear password jumper is used, both the User and Administrative passwords will be cleared.
Password on Boot	<b>Enabled</b> Disabled	Requires password entry before boot. System will remain in secure mode until password is entered. This option is only available if a User Password is configured.
Fixed Disk Boot Sector	<b>None</b> Write Protect	When Write Protect is enabled, the boot sector of the hard drive is protected. This prevents viruses from corrupting the drive.

continued

**Table 17. Security Menu** (continued)

Feature	Choices	Description
Secure Mode Timer	<b>1 minute</b> 2 minutes 5 minutes 10 minutes 20 minutes 60 minutes 120 minutes	This option sets the number of minutes of PS/2 keyboard or mouse inactivity that are allowed before Secure Mode is activated. This option is only available if a User Password is configured.
Secure Mode Hot Key (Ctrl-Alt-)	[L] [Z]	Select the key combination (Ctrl-Alt-L or Ctrl-Alt-Z) to instantly put the system into Secure Mode instead of waiting for the Secure Mode Timer to time-out.  This option is only available if a User Password is configured.
Secure Mode Boot	Enabled <b>Disabled</b>	When this option is enabled, the system will always boot directly into Secure Mode and the user must enter a password to unlock the system. This option is only available if a User Password is configured.
Video Blanking	Enabled <b>Disabled</b>	When enabled, the video is blank when the system is in Secure Mode. A password is required to take the system out of Secure Mode and restore the video. This option is only available if a User Password is configured.
Power Switch Inhibit	Enabled <b>Disabled</b>	This option disables the power button on the front panel. When enabled, pressing the power button has no effect.
NMI Control	<b>Enabled</b> Disabled	This option enables or disables NMI control through the Baseboard Management Controller. The NMI button is located on the front panel.

## Server Menu

You can make the following selections from the Server Menu.

**Table 18. Server Menu**

Boot Priority	Device	Description
System Management	<Enter>	Enters submenu.
Console Redirection	<Enter>	Enters submenu.
Event Log Configuration	<Enter>	Enters submenu.
Fault Resilient Booting	<Enter>	Enters submenu.
Assert NMI on PERR	Enabled <b>Disabled</b>	When enabled, PCI bus parity errors (PERR) cause a system NMI.
Assert NMI on SERR	Enabled <b>Disabled</b>	When enabled, PCI bus system errors (SERR) cause a system NMI.
FRB-2 Policy	<b>Disable BSP</b> Do Not Disable BSP Retry 3 Times Disable FRB2 Timer	This option determines when the Boot Strap Processor should be disabled if an FRB-2 error occurs.

continued

**Table 18. Server Menu (continued)**

POST Error Pause	<b>Enabled</b> Disabled	When enabled, the system will wait for user intervention if a critical POST error is encountered.  When disabled, the system will boot without user intervention when possible.
Boot Monitoring	<b>Disabled</b> 5 Minutes 10 Minutes 15 Minutes 20 Minutes 25 Minutes 30 Minutes 35 Minutes 40 Minutes 45 Minutes 50 Minutes 55 Minutes 60 Minutes	This option sets the amount of time that the OS Watchdog Timer is programmed to. When disabled, the OS Watchdog Timer is not used.  This option is not available if either the Hard Disk OS Boot Timeout option or the PXE OS Boot Timeout option on the Fault Resilient Booting Menu is not set to Disabled.
Boot Monitoring Policy	<b>Retry 3 Times</b> Retry Service Boot Always Reset	This option configures the system response to the expiration of the Watchdog Timer.  This option is not available if either the Hard Disk OS Boot Timeout option or the PXE OS Boot Timeout option on the Fault Resilient Booting Menu is not set to Disabled.

**Table 19. System Management Submenu**

Boot Priority	Device	Description
Board Part Number	N/A	Information only
Board Serial Number	N/A	Information only
System Part Number	N/A	Information only
System Serial Number	N/A	Information only
Chassis Part Number	N/A	Information only
Chassis Serial Number	N/A	Information only
BIOS Revision	N/A	Information only
BMC Device ID	N/A	Information only
BMC Firmware Revision	N/A	Information only
BMC Device Revision	N/A	Information only
PIA Revision	N/A	Information only
SDR Revision	N/A	Information only
Primary HSBP Revision	N/A	Information only, displaying the revision of the Hot-swap backplane. This information is not available if the HSBP is not detected.
Secondary HSBP Revision	N/A	Information only, displaying the revision of the Hot-swap backplane. This information is not available if the HSBP is not detected.

**Table 20. Console Redirection Submenu**

Feature	Choices	Description
BIOS Redirection Port	Serial Port A Serial Port B <b>Disabled</b>	When a serial port is selected, BIOS Console Redirection is enabled and uses the I/O port specified. Enabling this option disables Quiet Boot.
ACPI Redirection Port	Serial Port A Serial Port B <b>Disabled</b>	This option enables ACPI OS Headless Console Redirection.
Baud Rate	9600 <b>19.2k</b> 38.4k 57.6K 115.2k	This specifies the baud rate to be used when console redirection is enabled. When the Emergency Management Port shares the COM port for console redirection, the baud rate must be set to 19.2k to match the baud rate for the Emergency Management Port baud rate, unless the auto-baud feature is used.
Flow Control	None, <b>CTS/RTS</b> XON/XOFF CTS/RTS +CD	None disallows flow control. CTS/RTS is hardware-based flow control. XON/XOFF is software-based flow control. CTS/RTS +CD is hardware-based with carrier detection flow control. When the Emergency Management Port shares the COM port for console redirection, the flow control must be set to CTS/RTS or to CTS/RTS +CD, depending on whether a modem is used.
Terminal Type	PC-ANSI <b>VT100+</b> VT-UTF8	This option selects the character set to send through the serial port when console redirection is enabled. VT-UTF8 uses Unicode characters. VT100+ works only with English. PC-ANSI is the standard PC-type terminal.

**Table 21. Event Log Configuration Submenu**

Feature	Choices	Description
Clear All Event Logs	Yes <b>No</b>	When Yes is selected, the BIOS will clear the System Event Log at the next boot.
Event Logging	<b>Enabled</b> Disabled	When enabled, system events are stored in the System Event Log.
Critical Event Logging	<b>Enabled</b> Disabled	When enabled, critical events, such as PERR, SERR, ECC memory errors, and NMI are stored in the System Event Log.

**Table 22. Fault Resilient Booting Submenu**

<b>Boot Priority</b>	<b>Device</b>	<b>Description</b>
Late POST Timer	5 minutes 10 minutes 15 minutes 20 minutes <b>Disabled</b>	This option controls the time allowed for add-in card option ROM initialization. The system reboots if the timer runs down to zero.
Fault Resilient Booting	<b>Stay On</b> Reset Power Off	This option controls the policy on FRB timeouts. If stay on is selected, the server remains powered on if the FRB timer runs down to zero. If reset is selected, the server reboots. If power off is selected, the server is powered down.
Hard Disk OS Boot Timeout	5 minutes 10 minutes 15 minutes 20 minutes <b>Disabled</b>	This option controls the amount of time the system is allowed to boot an operating system from a hard disk drive.  This option is not available if the Boot Monitoring option on the Server Menu is not set to Disabled.
PXE OS Boot Timeout	5 minutes 10 minutes 15 minutes 20 minutes <b>Disabled</b>	This option controls the amount of time permitted to load the operating system from a device that is compliant with the PXE specification.  This option is available only if the Boot Monitoring option on the Server Menu is set to Disabled.

## Boot Menu

You can make the following selections from the Boot Menu.

**Table 23. Boot Menu**

Boot Priority	Device	Description
Boot Device Priority	<Enter>	Enters submenu
Hard Disk Drives	<Enter>	Enters submenu
Removable Devices	<Enter>	Enters submenu
ATAPI CD-ROM Drives	<Enter>	Enters submenu

**Table 24. Boot Device Priority Submenu**

Boot Priority	Device	Description
1	Removable Devices	The server attempts to boot from the diskette drive or removable device such as the LS-120.
2	Hard Drive	The server attempts to boot from a hard drive device.
3	ATAPI CD-ROM Drive	The server attempts to boot from an ATAPI CD-ROM drive containing bootable media.
4	Any SCSI CD-ROM Drive	The server attempts to boot from a SCSI CD-ROM drive containing bootable media. This option is available only if a bootable CD-ROM is present. The device needs to be controlled by a BIOS Boot Specification-compliant SCSI option ROM.
5	IBA	Intel Boot Agent. The system attempts to boot from the network. This entry will appear if there is a network device in the system that is controlled by a PXE-compliant option ROM.

**Table 25. Hard Drive Selection Submenu**

Feature	Choices	Description
<b>Device list:</b> Drive #1 (or the drive string) Other bootable cards Each drive with a PnP header	Select device	Use the up and down arrow keys, then select the device with the Enter key  "Other bootable cards" indicates boot devices that are not reported to the system BIOS through the BIOS boot specification mechanism. These devices may or may not be bootable.

**Table 26. Removable Devices Submenu**

Feature	Choices	Description
<b>Device list:</b> Bootable, removable devices	Select device	Use the up and down arrow keys, then select the device with the Enter key

**Table 27. ATAPI CD-ROM Devices Submenu**

Feature	Choices	Description
<b>Device list:</b> ATAPI CD-ROM drives	Select device	Use the up and down arrow keys, then select the device with the Enter key

## Exit Menu

You can make the following selections on the Exit Menu. Select an option using the up or down arrow keys, then press <Enter> to execute the option. Pressing <Esc> does not exit this menu. You must select one of the items from the menu or from the menu bar to exit.

**Table 28. Exit Menu**

Choices	Description
Exit Saving Changes	Exit after writing all modified Setup item values to CMOS.
Exit Discarding Changes	Exit leaving CMOS unmodified. User is prompted if any of the setup fields were modified.
Load Setup Defaults	Load default values for all SETUP items.
Load Custom Defaults	Load values from previously saved custom defaults. This option is not available if no custom defaults are detected.
Save Custom Defaults	Stores custom defaults in NVRAM.
Discard Changes	Read previous values from NVRAM.

# Upgrading the BIOS

## Preparing for the Upgrade

Before you upgrade the BIOS, prepare for the upgrade by recording the current BIOS settings, obtaining the upgrade utility, and making a copy of the current BIOS.

### Recording the Current BIOS Settings

1. Boot the computer and press <F2> when you see the message:  
`Press <F2> Key if you want to run SETUP`
2. Write down the current settings in the BIOS Setup program.

#### ⇒ NOTE

Do not skip step 2. You will need these settings to configure your computer at the end of the procedure.

### Obtaining the Upgrade Utility

You can upgrade to a new version of the BIOS using the new BIOS files and the BIOS upgrade utility, iFLASH.EXE. You can obtain the BIOS upgrade file and the iFLASH.EXE utility through your computer supplier or from the Intel Customer Support website:

<http://support.intel.com/support/motherboards/server/SE7501HG2>

#### ⇒ NOTE

Please review the instructions distributed with the upgrade utility before attempting a BIOS upgrade.

This upgrade utility allows you to:

- Upgrade the BIOS in flash memory
- Update the language section of the BIOS

The following steps explain how to upgrade the BIOS.

### Creating a Bootable Diskette

1. Use a DOS system to create the diskette or boot the server to the System Resource CD and select “Quit to DOS”.
2. Insert a diskette in diskette drive A.
3. At the C:\ prompt, for an unformatted diskette, type:  
`format a: /s`  
or, for a diskette that has already been formatted, type:  
`sys a:`
4. Press <Enter>.

## Creating the BIOS Upgrade Diskette

The BIOS upgrade file is a compressed self-extracting archive that contains the files you need to upgrade the BIOS.

1. Insert the bootable diskette into the diskette drive.
2. Extract the contents of the BIOS.EXE file onto the bootable diskette. To do this, type:  
`BIOS.EXE A:` Refer also to any instructions included with the BIOS package.
3. The BIOS upgrade image files are extracted directly into the floppy disk.

## Performing the BIOS Upgrade

1. Place the bootable diskette containing the BIOS update files into the diskette drive of your system. Boot the system with the diskette in the drive.
2. Choose option 1 to automatically update the system BIOS. This will update the system BIOS and reset the system. Choose option 2 to update the User Binary and reset the system.
3. Wait while the BIOS files are updated. Do **not** power down the system during the BIOS update process! The system will reset automatically when the BIOS update process is completed. Remove the diskette from the diskette drive.
4. Verify that the BIOS version displayed during POST is the new version as the system reboots.
5. Enter Setup by pressing the F2 key during boot. Once in Setup, press the F9 and <Enter> to set the parameters back to default values.
6. Re-enter the values you wrote down at the beginning of this process. Press F10 and <Enter> to exit BIOS Setup and Save Changes.
7. If you do not set the CMOS values back to defaults using the F9 key, the system may function erratically.

### ⇒ NOTE

You may encounter a CMOS Checksum error or other problem after reboot. If this happens, shut down the system and restart it. CMOS checksum errors require that you enter Setup, check your settings, save your settings, and exit Setup.

## Recovering the BIOS

It is unlikely that anything will interrupt the BIOS upgrade; however, if an interruption occurs, the BIOS could be damaged. See “Recovering the BIOS” on page 119 for instructions.

## Changing the BIOS Language

You can use the BIOS upgrade utility to change the language that the BIOS uses for messages and for the Setup program. Use a bootable diskette containing the Intel flash utility and language files.

1. Boot the computer with the bootable diskette in drive A. The BIOS upgrade utility screen appears.
2. Select `Update Flash Memory From a File`.
3. Select `Update Language Set`. Press <Enter>.
4. Select drive A and use the arrow keys to select the correct `.lng` file. Press <Enter>.

5. When the utility asks for confirmation that you want to flash the new language into memory, select `Continue with Programming`. Press `<Enter>`.
6. When the utility displays the message `upgrade is complete`, remove the diskette. Press `<Enter>`.
7. The computer will reboot and the changes will take effect.

## Hot Keys

Use the keyboard's numeric pad to enter numbers and symbols.

**Table 29. Hot Keys**

<b>To Do This:</b>	<b>Press These Keys</b>
Secure your system immediately.	<code>&lt;Ctrl+Alt&gt;</code> +hot key (Set your hot key combination with the SSU or BIOS Setup)
Enter BIOS Setup during POST.	<code>&lt;F2&gt;</code>
Abort memory test during POST.	<code>&lt;ESC&gt;</code> (Press while BIOS is updating memory size on screen)
Display a menu for selecting the boot device.	<code>&lt;ESC&gt;</code> (Press anytime after memory check)
To remove the splash screen.	<code>&lt;ESC&gt;</code>



## 4 Configuration Software and Utilities

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### System Software Update Sequence

When you update the system software, you should do it in the following order.

1. Update firmware (BMC & HSC)
2. Update FRU/SDR
3. Unplug system for 30 seconds
4. Update BIOS
5. Clear CMOS

**Table 30. Configuration Utilities**

Utility	Description and brief procedure	Page
Server Configuration Wizard	Use to configure the server, including creating and modifying the service partition, setting the system date and time, load FRU and SDR information, set server management information, create diskettes.	82
Direct Platform Control (DPC) Console	Use to access and monitor the server remotely.	82
System Setup Utility (SSU) and Client System Setup Utility (CSSU)	Use for viewing and configuring server management options, viewing the system event log (SEL), setting boot device priority, or setting system security options.  The SSU can run either from the configuration software CD or from a set of bootable diskettes. You can create the diskettes from the CD.  The CSSU is run from the service partition via the DPC console. It provides the same functionality as the SSU, but is used from a remote console.  Information entered via the SSU or /CSSU overrides information entered via BIOS Setup.	85
BIOS Update Utility	Use to update the BIOS or recover from a corrupted BIOS update.	91
Firmware Update Utility	Use to update BMC flash ROM or other firmware.	96
FRU/SDR Load Utility	Use to update the Field Replaceable Unit (FRU) and Sensor Data Record (SDR) flash components.  NOTE: You must run the FRU/SDR Load utility whenever the BMC is updated or if you change your processors.	100

# Server Configuration Wizard

The Server Configuration Wizard (SCW) is a utility that is provided to help you configure your server. The Server Configuration Wizard is located on the System Resource CD-ROM shipped with the server and it runs automatically when you boot your server to this CD-ROM. The Server Configuration Wizard includes a help system that can be accessed by clicking the Help button.

Run the Configuration to:

- Create or update a Service Partition and install service partition files, including files that are necessary to run the System Setup Utility
- Load FRUs and SDRs
- Set the System Asset Tag
- Set Server Management settings, including an IP address, emergency management port (EMP) settings, platform event paging (PEP) settings, and LAN/Alert settings
- Execution utility applications that can be used to manually configure the server
- Create startup or installation diskettes for hardware device drivers and server configuration utility applications

When it is first executed, the SCW probes the server for installed devices, firmware, chassis information, hard disks, and other relevant data. This information is used to determine the questions the application needs to ask you to complete the configuration.

When you select the options Server Configuration Wizard > Run Wizard, you will be shown a selection window allowing you to choose the items you want to configure. You can select one or more options to configure at the same time. Some options have dependencies that make you select multiple options. These are:

- If you select Configure this server for LAN Alerting, the option for Configure this server for remote Server Management over a LAN connection will automatically be selected.
- If you select Configure this server for Serial/Modem alerting, the option for Configure this server for remote Server Management over a Serial/Modem connection will automatically be selected.

In addition, you can select only one of the following at a time:

- Load SDRs only onto this server  
OR
- Load FRUs and SDRs onto this server

If you select multiple options, the Server Configuration Wizard will run each option to completion.

To use the Server Configuration utility to	Description of procedure	Page
Configure the server for remote LAN management	Enable a connection to the server from a workstation on the LAN to allow remote management functions, such as powering the server on or off, or running diagnostic utilities.	92
Configure for Remote Serial / Modem management	Enable a connection to the server from a serial or Modem connection to allow remote management functions, such as powering the server on or off, or running diagnostic utilities.	93
Configure for Serial / Modem alerting	Configure the server to send a telephone page in the event that a hardware or firmware error occurs at the server.	96
Configure for LAN alerting	Configure the server to send a notification message to a workstation segment of the network in the event that a hardware or firmware error occurs at the server.	97
Run the FRU/SDR Load Utility	Use to update the Field Replaceable Unit (FRU) and Sensor Data Record (SDR) flash components. NOTE: You must run the FRU/SDR Load utility whenever the BMC is updated or if you change your processors.	100
Configure an Asset Tag	Assign an identification number or serial number to the server	104
Create / modify the service partition	If a service partition does not already exist, create one. If a service partition has been created earlier, update it.	105
Create System or Utility / Device Diskettes	Create diskettes by operating system, utility, or device driver	104
Save / load configuration data	Save the configuration data to a file. Use this saved file to configure other servers identically.	106

# Direct Platform Control (DPC) Console

Direct Platform Control (DPC) Console is part of Intel Server Management. Direct Platform Control is a server management application that supports remote system management via LAN, or an RS-232 serial connection to the server Serial B port over a modem or a direct serial cable. The Direct Platform Control Console provides the ability for remote management of Intel servers via modem or LAN with a capability to run DOS-based programs.

DPC console runs on a client workstation and is independent of the server operating system. It communicates with a server by:

- Accessing the server management capabilities of the on-board NIC
- A Windows 2000 compatible modem.
- An RS-232 connection to the server's Serial B port.

Even when the server is off, you can use DPC Console to verify the state of a server or diagnose a problem with the server hardware. DPC console features allows you to:

- Establish connection to remote servers
- Server Control: power on, power off, and reset operations
- Retrieve and display entries in the System Event Log (SEL)
- Retrieve and display Sensor Data Records (SDR)
- Retrieve and display Field Replaceable Unit (FRU) information
- Retrieve and display current Remote Sensor Access (RSA) information
- Access a phonebook for remote connection management
- Remote control of the service partition
- File transfer from / to the server

## DPC Console Modes of Operation

There are four DPC console modes of operation:

- EMP mode. Access the DPC console features using the DPC console window menus and/or toolbar. Active when a connection is established through the EMP port (Serial B).
- DPC over LAN mode. Access the DPC console features using the DPC console window menus and/or toolbar. Active when a connection is established through the LAN.
- Re-direct mode. Active when the server is running BIOS console redirection. In this mode, the DPC console launches a separate window. The window operates as an ANSI terminal and communicates with the server through the port. Character-based commands you type in the DPC Console go directly to the server, and the DPC Console displays the text that you would normally see on the server console.

To use this mode, you must configure the Console Redirection option of BIOS Setup for Re-direct mode. Enabling Console Redirection requires that the Boot Time Diagnostics Screen be Enabled in BIOS Setup. If the redirection window does not display information, the Console Redirection is either incorrectly configured or disabled, the EMP is disabled in BIOS Setup, or the server is in protected mode. For DPC to function in this mode, the server must NOT be in graphics mode.

If the DPC console fails to connect in EMP within 10 seconds and the server can operate in Re-direct mode, a prompt is displayed with the option to switch to Re-direct mode.

- Service Partition mode. Entered when the server reboots from the service partition and the DPC Console has successfully connected to the server. This mode allows running of DOS-based programs that are stored on the service partition and transferring of files.

## Running the DPC Console

For more information about setting up and running the DPC Console, see the ISM Installation User's Guide. This document is in the ISM\DOCS\[language] directory on the ISM CD accompanying the SE7501HG2 server board.

## Using the System Setup Utility

The System Setup Utility (SSU) is located on the System Resource CD-ROM that is shipped with the server.

Run the System Setup Utility to:

- Set boot device priority
- Set passwords and security options
- View system events
- View FRU information
- View sensor data records
- Update system firmware and BIOS
- Save and restore the system configuration
- Set up the server to send alerts for platform events
- Set up the server for remote management

Using either the System Setup Utility or BIOS Setup, you can specify the boot device sequence and set up system passwords and security options. Both utilities access the same stored configuration data for these items, and the result of making a change to these settings using either utility is identical.

The SSU consists of a collection of task-oriented modules plugged into a common framework called the Application Framework (AF). The Application Framework provides a launching point for individual tasks and a location for setting customization information.

## Creating SSU Diskettes

You can run the SSU from the Server Configuration Utilities menu of the Server Configuration Wizard, from a set of DOS diskettes, or from the service partition of the hard disk.

If you choose to run the SSU from a set of DOS diskettes, you must create the SSU diskettes from the Resource CD-ROM as follows:

1. Boot the System Resource CD-ROM to the Server Configuration Wizard.
2. Choose Create Diskettes > Create Diskettes by Device/Function > System Setup Utility.
3. Follow the instructions displayed.

Alternatively, if you have a workstation with the Microsoft Windows operating system, you can insert the CD into that system and create the diskettes on that system.

## Running the SSU

When the SSU starts in the default local execution mode, it accepts input from the keyboard or mouse. The SSU presents a VGA-based GUI on the primary monitor.

If you run the SSU from read-only media you cannot save user preference settings (such as screen colors).

The SSU supports ROM-DOS version 6.22. The SSU will not operate from a “DOS box” running under an operating system such as Windows.

Start the SSU using one of the following methods:

- From diskettes: Insert the first SSU diskette in drive A and boot the server from the diskette. You are prompted to insert the second diskette. After loading completes the SSU starts automatically.
- From the System Resource CD: Boot the server to the Server Configuration Wizard and start the SSU from the Server Configuration Utilities menu.
- From the Service Partition: Boot the server to the Service Partition and execute the following DOS commands:

```
C:\> cd ssu
```

```
C:\SSU> ssu.bat
```

The mouse driver loads if it is available; press <Enter> to continue.

When the SSU title appears on the screen, press <Enter> to continue.

## Working with the SSU Interface

You can access features of the SSU interface using the mouse or keyboard:

- **Mouse:** Click once to choose menu items and buttons or to select items in a list, such as the Available Tasks list. To run a list item, such as one of from the Available Tasks list, select the item and click OK or double-click the item.
- **Keyboard:** Use the tab and arrow keys to highlight buttons and press the spacebar or <Enter> to execute. You can also execute a menu or button by using the <Alt> key in combination with the underlined letter in the name of the menu or button.

You can have more than one task open at the same time, although some tasks might require complete control to avoid possible conflicts. The tasks achieve complete control by keeping the task as the center of operation until you close the task window.

The SSU has a build-in help system, which you access by clicking a Help button or choosing the Help menu.

## Customizing the SSU Interface

The SSU lets you customize your interface using the Preferences section of the main window. The AF sets these preferences and saves them in the AF.INI file so that they take effect the next time you start the SSU. There are four user customizable settings:

- **Color:** lets you change the default colors associated with different items on the screen using predefined color combinations. The color changes take effect immediately.
- **Mode:** lets you set the desired expertise level: novice, intermediate, or expert. The expertise level determines which tasks are visible in the Available Tasks section and which actions each task performs. For a new mode setting to take effect, you must exit the SSU and restart it.
- **Language:** lets you change the text in the SSU to the appropriate language. For a new language setting to take effect, you must exit the SSU and restart it.
- **Other:** lets you show or hide the status bar at the bottom of the SSU main window. The change takes effect immediately.

### ⇒ NOTE

If you run the SSU from read-only media (CD-ROM, for example), these preferences are lost when you exit the SSU.

## Exiting the SSU

Exiting the SSU closes all SSU windows.

## Setting Boot Device Priority

To change the boot priority of a device:

1. From the SSU Main window, choose Boot Devices.
2. In the Multiboot Options Add-in window, select a device.
3. Click the Move Up button to move it up in the list. Click the Move Down button to move it down.

## Setting Passwords and Security Options

You can set a user password and an administrator password for the server. You must set an administrator password before you can set a user password. On other systems, the passwords are independent. You can set the same passwords and security options by using BIOS Setup.

### Setting the Administrator Password

The Admin Password button lets you set or change the administrator password used by both the SSU and the system BIOS. This option is not available if both an administrator and a user password are set and you entered only the user password when you started the SSU. All changes to the administrator password take effect immediately.

To change or clear the administrator password:

1. From the SSU Main window, choose Security.
2. Click the Admin Password button.
3. If you are changing passwords, enter the old password.
4. Enter the new password (or leave blank to clear).
5. Confirm the password by entering it again (or leave blank to clear).
6. Click OK to save the password and return to the Security window.

### Setting the User Password

The User Password button lets you set or change the user password used by both the SSU and the system BIOS. All changes to the user password take effect immediately.

To change or clear the user password:

1. From the SSU Main window, choose Security.
2. Click the User Password button.
3. If you are changing passwords, enter the old password in the first box.
4. Enter the new password (or leave blank to clear).
5. Confirm the password by entering it again (or leave blank to clear).
6. Click OK to save the password and return to the Security window.

## Setting Security Options

For a description of security features, see “Setting Passwords and Security Options” on page 88.

To set the security options:

1. In the Security window, click the Options button.
2. For each option, select the desired setting from the list. The options are:
  - **Security Hot Key:** The key combination that can be used to put the server into secure mode.
  - **Secure Mode Timer:** If no keyboard or mouse activity occurs during the chosen time interval, the server enters secure mode.
  - **Secure Mode Boot:** Enable forces the server to boot directly into secure mode.
  - **Video Blanking:** Enable turns off the video when the server is in secure mode.
  - **Floppy Write:** Enable prevents writing to the diskette drive while the server is in secure mode.
  - **Power Switch Inhibit:** Enable prevents the power and reset buttons from functioning when the server is in secure mode. Disable allows the power and reset buttons to function normally when the server is in secure mode.
3. Click Save to save the settings and return to the Security window.

## Viewing the System Event Log

To view the System Event Log (SEL):

1. From the SSU Main window, choose SEL Manager.

When you start the SEL Manager, it automatically loads the current list of events from non-volatile memory.
2. Use the <F4> and <F5> keys to scroll the window contents to the left and right to view all of the columns.
3. Use the File and SEL menu items to work with the SEL information:
  - **Open:** Views data from a previously saved SEL file.
  - **Save As:** Saves the currently loaded SEL data to a file.
  - **Properties:** Displays information about the SEL.
  - **Clear SEL:** Clears the SEL data from the nonvolatile storage area.
  - **Reload:** Refreshes the display by reading the current SEL entries from the server.
  - **Sort By:** Sorts the displayed events by event number, time stamp, sensor type and number, event description, or event generator ID.

## Viewing FRU Information

To view the Field Replaceable Unit (FRU) information:

1. From the SSU Main window, choose FRU Manager.

When you start the FRU Manager, it automatically loads the current list of events from non-volatile memory.

The FRU Manager window has a navigation pane on the left that displays, in a tree format, the inventory of components in the server. The tree has three categories: Chassis, Board, and Product. Clicking on a category expands or collapses a list of components for that category. Clicking on an individual component displays the FRU information for that component in the presentation pane in the upper right. The description pane in the lower right displays a description of the currently selected FRU area.

2. Use the <F4> and <F5> keys to scroll the window contents to the left and right to view all of the columns.
3. Use the File and FRU menu items to work with the FRU information:
  - **Open:** Views data from a previously saved FRU file.
  - **Save As:** Saves the currently loaded FRU data to a file.
  - **Properties:** Displays the number of FRU devices in the system and the number being displayed. Only FRU devices with valid FRU areas are displayed.
  - **Reload:** Refreshes the display by reading the current FRU entries from the server.

## Viewing Sensor Data Records

To view the Sensor Data Records (SDR):

1. From the SSU Main window, choose SDR Manager.

When you start the SDR Manager, it automatically loads the SDR entries from non-volatile memory.

The SDR Manager window has a navigation pane on the left that displays, in a tree format, the sensor data records. The tree has categories for each type of record. Clicking on a category expands or collapses a list of SDRs for that category. Clicking on an individual SDR displays the information for that SDR in the presentation pane in the upper right. The description pane in the lower right displays a description of the currently selected SDR type.

2. Use the <F4> and <F5> keys to scroll the window contents to the left and right to view all of the columns.
3. Use the File and SDR menu items to work with the SDR information:
  - **Open:** Views data from a previously saved SDR file.
  - **Save As:** Saves the currently loaded SDR data to a file.
  - **Properties:** Displays information about the SDR, including IPMI version, number of SDR entries, time stamps for changes to the SDR information, and free space remaining.
  - **Reload:** Refreshes the display by reading the SDR data from the server.

## Updating System Firmware and BIOS

Using the SSU, you can update the BIOS, update the firmware, and verify the firmware. Procedures for each are given below. You can also update the BIOS and firmware without using the SSU. You can download the updates from the Intel support website:

<http://support.intel.com/support/motherboards/server>

### Updating the BIOS

To update the BIOS:

1. Download the update from the Intel support website.
2. From the SSU Main window, choose System Update. (System Update is available only in Expert mode.)

When you start System Update, it automatically displays the current revision information for the system firmware and BIOS.

3. From the File menu, choose Load and choose a .uif or .bio file to use for the update.
4. Click the Update button to update the BIOS.

### Updating the Firmware

To update the system firmware:

1. Download the update from the Intel support website.
2. From the SSU Main window, choose System Update. (System Update is available only in Expert mode.)

When you start System Update, it automatically displays the current revision information for the system firmware and BIOS.

3. From the File menu, choose Load and choose a .uif or .hex file to use for the update.
4. Click the Update button to perform the update.

### Verifying the Firmware

To compare the system firmware in nonvolatile memory with a firmware file:

1. Download the update from the Intel support website.
2. From the SSU Main window, choose System Update. (System Update is available only in Expert mode.)

When you start System Update, it automatically displays the current revision information for the system firmware and BIOS.

3. From the File menu, choose Load and choose a .hex file to use for the update.
4. Click the Verify button to compare the firmware code in nonvolatile storage with the selected file.

# Managing the Server Remotely

You can set up the server so that you can connect to it from a remote client system to perform management tasks and so that the server can contact you if a system error occurs. You can make the connection over a LAN or by using a modem or direct serial cable to the Emergency Management Port (EMP). You can set up the server to notify you when various events occur. Alerts can be delivered either as telephone pages or over the LAN.

Instructions for setting up the server for remote LAN and serial/modem access and for setting up the server to proactively alert or page you are given below.

## How to Set Up Remote LAN Access

To set up the server so you can access it from a remote workstation, you can use either the Server Configuration Wizard or the System Setup Utility.

To use the Server Configuration Wizard to configure remote LAN access :

1. Use the Resource CD to boot the server to the Server Configuration Wizard.
2. Select Server Configuration Wizard and Continue.
3. Select Run Wizard and Continue.
4. Select the box that says “Configure this server for remote Server Management over a LAN connection”.
5. Review the system date and time for accuracy and Continue.
6. In the IP Setup screen, choose either:
  - **DHCP:** the IP address for the server is automatically assigned by the DHCP (dynamic host control protocol) server on the network. The Host, Gateway, and Subnet Mask boxes in the dialog are ignored.
  - **Static:** assign the IP address for the server using the Host, Gateway, and Subnet Mask boxes in the dialog.
7. If you chose Static IP Setup in the previous step, fill in the IP addressing boxes:
  - **Host IP Address:** the IP address of this server.
  - **Gateway IP Address:** the IP address of the router for this server.
  - **Subnet Mask:** the IP address for the server’s subnet. The server uses this to decide if the alert destination is on the same subnet.
  - **Backup Gateway IP Address:** (optional). The IP address of the alternate router for this server.
8. Click Continue. Click the LAN Password button (optional) to require that a password be entered before a user can perform server management functions on this server from a workstation on the LAN.
9. Select the LAN Access Mode to set the points at which LAN connectivity can be activated:
  - **Always Available:** a remote system can initiate a LAN connection, regardless of the server’s state or health
  - **Restricted:** power control functions, such as power down, front panel NMI, and system reset cannot be performed remotely
  - **Disabled:** remote LAN connections cannot be initiated

10. Select the SOL Access Mode to set the user access level that is required for connecting to the server using Serial over LAN
  - **Always Available:** an individual can access the server through Serial over LAN if that user knows the server User password
  - **Restricted:** an individual can access the server through Serial over LAN if that user knows the server Administrator password
  - **Disabled:** Serial over LAN cannot be used.
11. Select the baud rate and then Continue.

To use the System Setup Utility to configure remote LAN access:

1. From the SSU Main window, choose Platform Event Manager (PEM).
2. In the PEM window, click Configure LAN and fill in the boxes described in the following steps (boxes that aren't listed here are not required for remote access).
3. To require a password for remote access, enter the password in the Enter New Password box and in the Verify New Password box. Passwords can be from 1 to 16 characters long, using any ASCII character in the range [32-126]. To clear the passwords, leave both boxes blank. (You can also clear the password by choose the menu Options > Clear LAN Password.)
4. From the LAN Access Mode list, select the remote access mode:
  - **Always Available:** a remote system can initiate a LAN connection regardless of the state or health of the server.
  - **Restricted:** a remote system can initiate a LAN connection, but cannot perform control operations such as power down, reset, or front panel NMI.
  - **Disabled:** remote systems are not allowed to initiate LAN connections.
5. In the IP Setup box, choose either:
  - **DHCP:** the IP address for the server is automatically assigned by the DHCP (dynamic host control protocol) server on the network. The Host, Gateway, and Subnet Mask boxes in the dialog are ignored.
  - **Static:** assign the IP address for the server using the Host, Gateway, and Subnet Mask boxes in the dialog.
6. If you chose Static IP Setup in the previous step, fill in the IP addressing boxes:
  - **Host IP Address:** the IP address of this server.
  - **Gateway IP Address:** the IP address of the router for this server.
  - **Subnet Mask:** the IP address for the server's subnet. The server uses this to decide if the alert destination is on the same subnet.
7. Click Save to save the changes.
8. Click Close to return to the PEM window.

## How to Set Up Remote Modem or Serial Access

To set up the server so you can access it through a modem or a serial connection, you can use either the Server Configuration Wizard or the System Setup Utility.

To use the Server Configuration Wizard to configure remote modem or serial access:

1. Use the Resource CD to boot the server to the Server Configuration Wizard.
2. Select Server Configuration Wizard and Continue.
3. Select Run Wizard and Continue.
4. Select the box that says “Configure this server for remote Server Management over a Serial/Modem connection”.
5. Review the system date and time for accuracy and Continue.
6. Enter the appropriate Serial / Modem parameters and Continue.
7. Click Continue. Click the Serial/Modem Password button (optional) to require that a password be entered before a user can perform server management functions on this server from a serial or Modem connection.
8. Select the Access Mode to set the points at which serial / Modem connectivity can be activated:
  - **Preboot Only:** the EMP is available only when the server is powered down or is running POST during startup. Once the operating system is loaded, a connection cannot be made.
  - **Always Active:** the EMP is available at any time.
  - **Disabled:** a connection cannot be made to the server using serial / Modem access
9. Select the Restricted Mode to set the restrict power control operations
  - **Enable:** enable restrictions. A user cannot use Serial / Modem access to affect the power state of the system, such as powering the server on or off.
  - **Disable:** disables restrictions. A user can choose to power the server on or off through a Serial / Modem connection.
10. Select the Connection Mode.
  - **Direct Connect:** Use direct connect when a system is connected directly to the server through the Serial port, without using an external modem.
  - **Modem Mode:** use Modem Mode when the Serial port is connected to an external modem.
11. System Phone Number: enter the telephone number that is used to connect to this server.
12. Click Continue.

To use the System Setup Utility to configure remote modem or serial access:

1. From the SSU Main window, choose Platform Event Manager (PEM).
2. In the PEM window, click Configure EMP and fill in the boxes described in the following steps (boxes that aren't listed here are not required for remote access).
3. To require a password for remote access, enter the password in the Enter New Password box and in the Verify New Password box. Passwords can be from 1 to 16 characters long, using any ASCII character in the range [32-126]. To clear the passwords, leave both boxes blank. (You can also clear the password by choose the menu Options > Clear LAN Password.)
4. In the Modem Ring Time box, enter the number of 500ms intervals that the BMC should wait before taking control of the serial 2 port and answering an incoming call. A value greater than zero gives the BIOS time to answer before the BMC takes control. A value of zero causes the

BMC to answer immediately. The maximum value, 63, tells the BMC to ignore the call. Modem Ring Time applies only to Preboot access mode and is ignored for other access modes.

5. In the System Phone Number box, enter the number for the phone line connected to the modem on the EMP.
6. From the Access Mode list, choose the remote access mode:
  - **Always Active:** the EMP is available at any time.
  - **Preboot:** the EMP is available only when the server is powered down or is running POST during startup. Once the operating system is loaded, a connection cannot be made.
  - **Disabled:** remote systems are not allowed to initiate connections.
7. From the Restricted Mode list, choose either:
  - **Enabled:** a remote system can initiate a connection, but cannot perform control operations such as power down, reset, or front panel NMI.
  - **Disabled:** the remote system has full control of the server.
8. From the Connection Mode list, choose either:
  - **Direct Connect:** the Serial B port on the server is connected by a serial cable to the remote system.
  - **Modem Connect:** the Serial B port on the server is connected to a modem.
9. Click Save to save the changes.
10. Click Close to return to the PEM window.

## How to Set Up Paging Alerts

To set up the server so it pages you in the event of an alert, you can use either the Server Configuration Wizard or the System Setup Utility.

To use the Server Configuration Wizard to configure the server to send alerts as telephone pages:

1. Use the Resource CD to boot the server to the Server Configuration Wizard.
2. Select Server Configuration Wizard and Continue.
3. Select Run Wizard and Continue.
4. Select the box that says “Configure this server for Serial/Modem Alerting” The box that says “Configure this server for remote Server Management over a Serial/Modem connection” will be automatically selected as a dependency.
5. Review the system date and time for accuracy and Continue.
6. Enter the appropriate Serial / Modem parameters and Continue.
7. Click the Serial/Modem Password button (optional) to require that a password be entered before a user can perform server management functions on this server from a serial or Modem connection.
8. Select the Access Mode to set the points at which serial / Modem connectivity can be activated:
  - **Preboot Only:** a serial or Modem connection can be made when the server is powered down or hard reset. Once the operating system is loaded, a connection cannot be made.
  - **Always Active:** a connection to the server can be established at any time
  - **Disabled:** a connection cannot be made to the server using serial / Modem access
9. Select the Restricted Mode to set the restrict power control operations
  - **Enable:** enable restrictions. A user cannot use Serial / Modem access to affect the power state of the system, such as powering the server on or off.
  - **Disable:** disables restrictions. A user can choose to power the server on or off through a Serial / Modem connection.
10. Select the Connection Mode.
  - **Direct Connect:** Use direct connect when a system is connected directly to the server through the Serial port, without using an external modem.
  - **Modem Mode:** use modem mode when the Serial port is connected to an external modem.
11. System Phone Number: enter the telephone number that is used to connect to this server.
12. Click Continue.
13. Select the Enable Serial/Modem Paging option
14. Enter the telephone number the system should send the page if an event happens.
15. Enter the paging string the server should send after a phone connection is made.
16. Enter the Blackout Period: the time in minutes that should be allowed between pages. The valid range is [0 - 255] where 0 disables the blackout period. Setting a blackout period can save you from being flooded with repeat pages. After you receive a PEP page, no additional pages are sent by PEP for the duration of the blackout period.
17. Click the Alert Paging Filters button. Click the boxes enable / disable filters. Click OK when you are done, and then click Continue.

To use the System Setup Utility to set up the server to send alerts as telephone pages:

1. Install an external modem on the Emergency Management Port (Serial B).
2. From the SSU Main window, choose Platform Event Manager (PEM).
3. In the PEM window, click Configure EMP.
4. In the corresponding boxes, enter the following command strings for the modem attached to the EMP port (boxes that aren't listed here are not required for paging alerts):
  - **ESC Sequence:** the escape sequence. This string is sent to the modem before sending command strings. The maximum length for the string is five characters; longer strings are truncated.
  - **Hangup String:** hang up or drop the connection. The EMP automatically sends an <ENTER> character following this string. The maximum length for the string is eight characters; longer strings are truncated.
  - **Modem Dial Command:** the command to dial a phone number. This string is sent to the modem before sending the paging string.
  - **Modem Init String:** the initialization string for the modem. This string is sent every time the EMP initializes. The maximum length for the string is determined at run-time from firmware. You will be notified if the string is truncated. Following a save, the actual string saved is displayed in the edit box.
5. Click Save to save the changes.
6. Click Close to return to the PEM window.
7. In the PEM window, click Configure PEP.
8. Select the Enable PEP check box.
9. In the Blackout Period box, enter the minimum time, in minutes, between successive pages. The valid range is [0 - 255] where 0 disables the blackout period. Setting a blackout period can save you from being flooded with repeat pages. After you receive a PEP page, no additional pages are sent by PEP for the duration of the blackout period.
10. In the Paging String box, enter the phone number to dial for the page and the message you want sent with the page. The maximum length for the paging string is determined at run-time from firmware. You will be notified if the string is truncated. Following a save, the actual string saved is displayed in the edit box.
11. From the Options menu, choose Configure Event Actions.
12. In the Platform Event Paging Actions window, move the events that you want to generate an alert to the Enabled column and move all other events to the disabled column using the following buttons:
  - >>: Moves all events from the enabled list to the disabled list.
  - >: Moves the selected event from the enabled list to the disabled list.
  - <: Moves the selected event from the disabled list to enabled the list.
  - <<: Moves all events from the disabled list to the enabled list.
13. Click Save to save the changes.
14. Click Close to return to the PEP Configuration window.
15. To send a test page to verify that you have correctly configured PEP, from the Options menu, choose Send Alert.
16. Click Save to save the configuration.
17. Click Close to return to the Platform Event Manager window.

## How Set Up LAN Alerts

To set up the server to send alerts over the LAN you can use either the SSU or the SCW. For more information about LAN alerts, see the documentation for Intel Server Management software.

To use the Server Configuration Wizard to configure the server to send alerts over the LAN:

1. Use the Resource CD to boot the server to the Server Configuration Wizard.
2. Select Server Configuration Wizard and Continue.
3. Select Run Wizard and Continue.
4. Select the “Configure this server for LAN Alerting” box. The box that says “Configure this server for remote Server Management over a LAN connection” will be automatically selected as a dependency.
5. Review the system date and time for accuracy and Continue.
6. In the IP Setup screen, choose either:
  - **DHCP:** the IP address for the server is automatically assigned by the DHCP (dynamic host control protocol) server on the network. The Host, Gateway, and Subnet Mask boxes in the dialog are ignored.
  - **Static:** assign the IP address for the server using the Host, Gateway, and Subnet Mask boxes in the dialog.
7. If you chose Static IP Setup in the previous step, fill in the IP addressing boxes:
  - **Host IP Address:** the IP address of this server.
  - **Gateway IP Address:** the IP address of the router for this server.
  - **Subnet Mask:** the IP address for the server’s subnet. The server uses this to decide if the alert destination is on the same subnet.
  - **Backup Gateway IP Address:** (optional). The IP address of the alternate router for this server.
8. Click Continue. Click the LAN Password button (optional) to require that a password be entered before a user can perform server management functions on this server from a workstation on the LAN.
9. Select the LAN Access Mode to set the points at which LAN connectivity can be activated:
  - **Always Available:** a remote system can initiate a LAN connection, regardless of the server’s state or health
  - **Restricted:** power control functions, such as power down, front panel NMI, and system reset cannot be performed remotely
  - **Disabled:** remote LAN connections cannot be initiated
10. Select the SOL Access Mode to set the user access level that is required for connecting to the server using Serial over LAN
  - **Always Available:** an individual can access the server through Serial over LAN if that user knows the server User password
  - **Restricted:** an individual can access the server through Serial over LAN if that user knows the server Administrator password
  - **Disabled:** Serial over LAN cannot be used.
11. Select the baud rate and then Continue.
12. Select the Enable LAN Alerting option

13. Enter the IP address for the system that should receive notifications if an event happens.
14. Enter the SNMP Community String. The default is public.
15. Check the box to resolve the Gateway MAC address (optional).
16. Click the LAN Alert Filters button. Click the boxes enable / disable filters. Click OK when you are done, and then click Continue.

To use the System Setup Utility to configure the server to send alerts over the LAN:

1. From the SSU Main window, choose Platform Event Manager (PEM).
2. In the PEM window, click Configure LAN and fill in the boxes described in the following steps (boxes that aren't listed here are not required for LAN alerts).
3. Select the Enable LAN Alerts check box.
4. (Optional) In the SNMP Community String box, enter a string for the community field in the Header section of the SNMP trap sent for an alert. The string must be from 5 to 16 characters. The default string is public.
5. In the IP Setup box, choose either:
  - **DHCP:** the IP address for the server is automatically assigned by the DHCP (dynamic host control protocol) server on the network. The Host, Gateway, and Subnet Mask boxes in the dialog are ignored.
  - **Static:** assign the IP address for the server using the Host, Gateway, and Subnet Mask boxes in the dialog.
6. If you chose Static IP Setup in the previous step, fill in the IP addressing boxes:
  - **Host IP Address:** the IP address of this server.
  - **Gateway IP Address:** the IP address of the router for this server.
  - **Subnet Mask:** the IP address for the server's subnet. The server uses this to decide if the alert destination is on the same subnet.
7. In the Alert IP Address box, fill in the IP address of the system you want to receive alerts from this server. If you want the alert to be broadcast to an entire subnet, enter the IP address for the subnet.
8. From the Options menu, choose Configure Event Actions.
9. In the BMC LAN Alerting Actions window, move the events that you want to generate an alert to the Enabled column and move all other events to the disabled column using the following buttons:
  - **>>:** Moves all events from the enabled list to the disabled list.
  - **>:** Moves the selected event from the enabled list to the disabled list.
  - **<:** Moves the selected event from the disabled list to enabled the list.
  - **<<:** Moves all events from the disabled list to the enabled list.
10. Click Save to save the changes.
11. Click Close to return to the BMC LAN Configuration window.
12. Click Save to save the changes.
13. Click Close to return to the PEM window.

# Firmware Update Utility Description

The Firmware Update Utility is a DOS-based program used to update the BMCs firmware code. You need to run the utility only if new firmware code is necessary.

## How to Run the Firmware Update Utility

Review the release notes before proceeding.

1. Create a DOS-bootable diskette. The version of DOS must be 6.22 or higher.
2. Place the firmware update utility (FWUPDATE.EXE) and the \*.hex file on the diskette. Make a note of the \*.hex file name, because you will need it later.
3. Insert the diskette into the drive and boot to it.
4. At the DOS prompt, run the executable file (FWUPDATE.EXE).
5. The utility displays a menu screen. Select "Upload Flash."
6. The utility asks for a file name. Enter the name of the \*.hex file.
7. The program will load the file and then ask if it should upload boot code. Press "N" to continue unless otherwise directed by the release notes or an Intel support professional.
8. The program next asks if it should upload operational code. Press "Y" to continue. The process of uploading operational code takes a few minutes.
9. Once the operational code updates and verifies, press any key to continue. Then press <ESC> to exit the program.
10. Proceed with the next section to load the FRU/SDR data.

## FRU/SDR Load Utility Description

The Field Replaceable Unit (FRU) and Sensor Data Record (SDR) load utility is a DOS-based program that is used to update the server management subsystem's product level FRU and SDR nonvolatile storage components (EEPROMs). The utility:

- Discovers the product configuration based on instructions in a master configuration file
- Displays the FRU information
- Updates the EEPROM associated with the Baseboard Management Controller (BMC) that holds the SDR and FRU area
- Generically handles FRU devices that might not be associated with the BMC

The utility can be run directly from the Resource CD or from diskettes created from the CD.

If you run the FRU/SDR Load Utility from a diskette, copy the utility from the CD. Follow the instructions in the included README.TXT file.

If the diskette drive is disabled, or improperly configured, use BIOS Setup to enable it. If necessary, disable the drive after you are done with the FRU/SDR Load Utility.

## How to Use the FRU/SDR Load Utility

The Server Configuration Wizard offers two routes to load the FRU/SDR records. One method is through the Server Configuration Wizard > Run Wizard menu. The other is through the Server Configuration Utilities menu. Instructions for each method follow.

To use the Server Configuration Wizard > Run Wizard menu to load the FRU/SDR records:

1. Use the Resource CD to boot the server to the Server Configuration Wizard.
2. Select Run Wizard and Continue.
3. Select Server Configuration Wizard and Continue.
4. To load only SDRs, select the option for Load SDRs only onto this server and Continue. To load both SDR records and FRU records, select the option for Load FRUs and SDRs onto this server and Continue.
5. Review the system date and time for accuracy and Continue.
6. Select the appropriate chassis type (SC5200 or Other) and Continue.
7. If you selected Load SDRs only onto this server in step 3, you have completed the SDR load. If you chose to load both SDR and FRU records, you are prompted to type in the chassis serial number and chassis part number. These entries are optional.

To use the Server Configuration Wizard > Server Configuration Utilities menu to load the FRU/SDR records:

1. Use the Resource CD to boot the server to the Server Configuration Wizard.
2. Select Server Configuration Utilities and Continue.
3. Select FRUSDR Load Utility and Continue.
4. You will see a black screen with a numbered prompt. Select the appropriate chassis type (SC5200 or Other).
5. Choose to load both FRU and SDR records, only SDR records, to modify the system asset tag, or to exit the application and return to the Server Configuration Wizard.

## Command Line Format

You can also update the FRU/SDR files from a command-line prompt, separately from the Server Configuration Wizard. This utility:

- Is compatible with ROM-DOS Ver. 6.22, MS-DOS Ver. 6.22 (and later versions), Windows 95 DOS, and Windows 98 DOS
- Accepts CFG, SDR, and FRU load files (the executable file for the utility is FRU/SDR.exe)
- Requires the following supporting files:
  - One or more .fru files describing the system's field replaceable units
  - A .cfg file describing the system configuration
  - An .sdr file describing the sensors in the system

The command line format to do this is:

```
FRU/SDR [-?] [-h] [-d {fru, sdr}] [-cfg filename.cfg] [-fru filename.fru]
```

**Table 31. Command Line Format**

Command	Description
-? or -h	Displays usage information.
-d {fru, sdr}	Displays requested area only.
-cfg filename.cfg	Uses custom CFG file.
-p	Pause between blocks of data.

## Parsing the Command Line

The FRU/SDR load utility allows only one command line function at a time. A command line function can consist of two parameters. Example: -cfg filename.cfg. Invalid parameters cause an error message and exit the program. You can use either a slash (/) or a minus sign (-) to specify command line options. Use the -p and flags with any of the other options.

## Displaying a Given Area

When the utility is run with the -d FRU or -d SDR command line flag, information about each area is read from memory and printed on the screen. Each area represents one sensor for each instrumented device in the server. If the given display function fails because of an inability to parse the data present or a hardware failure, the utility displays an error message and exits.

## Using Specified CFG File

Run the utility with the command line parameter of -cfg filename.cfg. The filename can be any DOS-accepted, eight-character filename string. The utility loads the specified CFG file and uses the entries in that file to probe the hardware and to select the proper SDRs to load into nonvolatile storage.

## Displaying Utility Title and Version

The utility displays its title:

```
FRU & SDR Load Utility, Version Y.Y, Revision X.XX where Y.Y is the version number and X.XX is the revision number for the utility.
```

## **Configuration File**

The configuration file is in ASCII text. The utility executes commands formed by the strings present in the configuration file. These commands cause the utility to run tasks needed to load the proper SDRs into the nonvolatile storage of the BMC and possibly generic FRU devices. Some of the commands may be interactive and require you to make a choice.

## **Prompting for Product Level FRU Information**

With a configuration file, the utility might prompt you for FRU information.

## **Filtering Records from the SDR File**

The MASTER.SDR file has all the possible SDRs for the system. You might need to filter these records based on the current product configuration. The configuration file directs the filtering of the SDRs.

## **Updating the SDR Nonvolatile Storage Area**

After the utility validates the header area of the supplied SDR file, it updates the SDR repository area. Before programming, the utility clears the SDR repository area. The utility filters all tagged SDRs depending on the product configuration set in the configuration file. Untagged SDRs come automatically programmed. The utility also copies all written SDRs to the SDR.TMP file; it contains an image of what was loaded. The TMP file is also useful for debugging the server.

## **Updating FRU Nonvolatile Storage Area**

After the configuration is determined, the utility updates the FRU nonvolatile storage area. First, it verifies the common header area and checksum from the specified FRU file. The internal use area reads out of the specified .FRU file then programmed into the nonvolatile storage. The chassis area reads out of the specified .FRU file. Finally, it reads the product area out of the specified FRU file, then the area programs into the FRU nonvolatile storage. All areas write to the FRU.TMP file.

## Setting a System Asset Tag

You can use the Server Configuration Wizard to set an asset tag on the server. An asset tag is a user-defined identification number or serial number and can contain both letters and numbers. Use the steps below to set an asset tag using the Server Configuration Wizard.

1. Use the Resource CD to boot the server to the Server Configuration Wizard.
2. Select the Server Configuration Wizard option and Continue.
3. Select the Run Wizard option and Continue.
4. Select the option for Configure this server with a System Asset Tag and Continue.
5. Type in the asset tag and Continue.

## Creating Diskettes

You can use the Resource CD to create diskettes for device drivers or for server management utilities. You can create diskettes for the NIC drivers, video drivers or SCSI drivers. You can also create diskettes to use for running the System Setup Utility and the FRU/SDR Load Utility. To create these diskettes, use the following steps:

1. Use the Resource CD to boot the server to the Server Configuration Wizard.
2. Select the Server Configuration Wizard option and Continue.
3. Select the Create Diskettes option and Continue.
4. Choose to create diskettes either by operating system or by utility/device driver and Continue.
5. If you chose operating system, you will be presented with a list of operating systems from which to select. If you selected utility / device driver, you will see a list of drivers and utilities from which to select. Select the appropriate operating system(s), utilities, and device driver(s) and Continue.

## Installing a Service Partition (Optional)

When you are setting up your server system, you can install a service partition onto your hard drive. The service partition includes utilities, and other software that can be run locally or remotely to assist in server management. The service partition uses approximately 40 MB of hard disk space.

The service partition can be installed either with the Server Configuration Wizard or with the Intel Server Management CD.

### ⇒ NOTE

It is highly recommended that you install the service partition **before** installing an operating system. For more information, see the Service Partition section in the *Installation and User's Guide for Intel Server Management*. This document is included on the ISM CD shipped with your server board.

To install the service partition use the Server Configuration Wizard

1. Use the Resource CD to boot the server to the Server Configuration Wizard.
2. Select the Server Configuration Wizard option and Continue.
3. Select the Run Wizard option and Continue.
4. Select the option for Install/Update a Service Partition and Continue.
5. Review the system date and time for accuracy and Continue.
6. If a service partition does not exist, you will see a screen listing the drives that the Server Configuration Wizard has identified. The fields are as follows:
  - Drive#: The order in which the drives were reported by the BIOS. Drive 1 is always the CD-ROM Drive and cannot have a service partition installed on it.
  - Size: the size of the drive in megabytes.
  - Formatted?: whether or not the drive has already been formatted for data storage.
  - Unused Space: the amount of space on the drive that has not been used.
  - SP Capable: whether or not a service partition can be created on the drive. The drive must be a minimum of 32 MB. Drives over 8 gigabytes must be empty, and the service partition can only be created on one of the first 8 drives reported.
7. Click Continue. The service partition will be created or updated.

### ⇒ NOTE

After the service partition is installed, you can boot to it by pressing F4 during POST. The service partition operating system is ROM-DOS. Once you have booted to the service partition, you will be at a DOS prompt. From the prompt, you can access utilities and perform server management functions by running batch files and executables. Example of these utilities include the System Setup Utility and FRU/SDR Load Utilities.

# Saving and Restoring the System Configuration

Using the System Setup Utility, you can save the following configuration information to a file:

- Platform type, BIOS revision, and firmware revision
- CMOS settings
- Extended system configuration data (ESCD)
- Settings for the emergency management port (EMP), platform event paging (PEP), and BMC LAN alerts

Data is saved from all sources. You cannot choose only certain pieces of configuration data to save. You can also restore the information from a saved configuration file.

## ⇒ NOTE

BIOS passwords are stored in the file. Restoring a configuration can change passwords on a server. EMP and LAN passwords are not stored in the file. Passwords cannot be saved or restored.

Using the Server Configuration Wizard, you can save the following configuration information to a file:

- Serial / Modem data
- Paging data
- LAN configuration data
- LAN Alert data
- Service Partition configuration
- System asset tag

## ⇒ NOTE

LAN passwords are not stored in the file. Passwords cannot be saved or restored.

## Saving a Configuration

To save the system configuration from the System Setup Utility:

1. From the SSU Main window, choose Config Save/Restore. (Configuration Save/Restore is available only in Expert mode.)
2. Click Save To File and specify a filename and location.

To save the system configuration from the Server Configuration Wizard:

1. Follow the configuration prompts until you see “Save Server Configuration”
2. Select the “Save Server Configuration” checkbox and click Continue.
3. Specify a filename and location as prompted.

## Loading a Saved Configuration

To load a previously saved system configuration from a file using the System Setup Utility:

1. From the SSU Main window, choose Config Save/Restore. (Configuration Save/Restore is available only in Expert mode.)
2. Click Restore from File and specify a filename and location.

### ⇒ NOTE

You can load only a configuration that had been previously saved with the SSU.

To restore the system configuration from a file using the Server Configuration Utility:

1. Boot from the Resource CD into the Server Configuration Wizard.
2. Select the Server Configuration Wizard > Load from Diskette. Click continue.

### ⇒ NOTE

You can load only a configuration that had been previously saved with the Server Configuration Wizard.

The utility reads the platform type, BIOS revision, and firmware revision from the file and compares that information with the same information retrieved from the server. If the two do not match, an error message is displayed and the load operation aborts. If they do match, the utility saves the configuration data to the server. You will need to reboot your server for the changes to take effect.

# Using the Intel Server Management and Intel® SMaRT Tool (Optional)

Intel Server Management and the hard drive Service Partition provide real-time monitoring and alerting for your SE7501HG2 server hardware, emergency remote management, and remote server setup. Intel Server Management is implemented by installing it within client-server architecture.

The Service Partition provides you with the ability to remotely access a local partition on the server and to identify and diagnose server health issues. Remote access is provided through either a modem or network connection.

To get started with Intel Server Management, install the Service Partition first. See “Installing a Service Partition (optional)” on page 105. After the service partition is installed, install operating system, and then Intel Server Management and the Intel SmaRT Tool. The information here describes installation on a system running a Microsoft Windows operating system.

The Intel Server Maintenance and Reference Training (SMaRT) Tool is an interactive software tool providing support information to assist with the maintenance and repair of Intel-based server systems and accessories. SMaRT Tool features visual, step-by-step instructions for replacing parts; a complete Field Replaceable Unit (FRU) database containing part numbers and images; product spares lists, and worldwide Intel support information.

Intel Server Management provides an interface to the Intel® SMaRT Tool, combining remote error detection and alerting with interactive maintenance and repair assistance. When Intel Server Management detects a hardware error and a part needs replacing, SMaRT Tool can be launched directly from Intel Server Management to locate the correct part information and corresponding “How to Replace” steps required to quickly get the server back up and running.

To activate Intel Server Management’s interface with the Intel SMaRT Tool, both software programs need to be installed. You can install the software on a server or on a workstation used to manage the server. The information here describes installation on a system running a Microsoft Windows operating system. For other operating systems, see the Installation Guide & User Guide located in the ISM/DOCS folder on the Intel Server Management CD-ROM. SMaRT Tool and ISM Console may only be installed on a system running a Microsoft Windows operating system.

## ⇒ **NOTE**

Prior to installation, uninstall any previous version of Intel Server Management.

## Installing Intel Server Management

You can install Intel Server Management on a local server or on a remote workstation that is used to manage a LAN/WAN.

1. Insert the Intel Server Management CD into the system's CD-ROM.
2. Click Install Server Management.
3. Select the applicable system option.
4. Review the Intel Software License Agreement and click Accept.
5. If installing to a local server, click Install Now. If this is a multiple system installation, click Add to compile a list of systems and then click Install Now.
6. Select Reboot Now or Reboot Later.
7. Remove the Intel Server Management CD.

## Installing Intel SMaRT Tool

Follow the instructions below to install the Intel Server Maintenance and Reference Training Tool (SMaRT Tool) on your system.

### ⇒ NOTE

SMaRT Tool may only be installed on a system running a Microsoft Windows operating system.

To download the SE7501HG2 SR5200 system module for SMaRT Tool, you must have Internet access.

1. Insert the System Resource CD into the system's CD-ROM drive.
2. Click on Intel SMaRT Tool in the menu on the left side of the screen.
3. In the green Make a Selection drop-down menu, select SMaRT Tool Install Guide. Print the Guide, and keep it on hand for reference.
4. Review the SMaRT Tool Install Guide prior to proceeding.
5. In the Make a Selection drop-down menu, select Install SMaRT Tool.
6. Click on the Run Installer icon to launch the SMaRT Tool Setup program.
7. Follow the on-screen installation instructions. Review the Intel Software License Agreement and click Accept. When installation is complete, launch SMaRT Tool.
8. In SMaRT Tool's Welcome page, click on Systems.
9. Select Select System > Servers > Xeon > SE7501HG2 SR5200 and follow the on-screen instructions to download the module. When the download is complete, SMaRT Tool will restart.
10. Select Systems > Select System > Servers > Xeon > SE7501HG2 SR52 to access information on your new server system.

You can invoke SMaRT Tool directly from Intel Server Management's Platform Instrumentation Control application by clicking on the SMaRT Tool icon, or by selecting Launch SMaRT Tool from the SMaRT Tool menu. The interface between the two programs is context-sensitive. To find out more about the integration between Intel SMaRT Tool and Intel Server Management, please select SMaRT Tool and Server Management in the Make a Selection drop-down menu.



## 5 Solving Problems

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This chapter helps you identify and solve problems that might occur while you are using the system.

### Resetting the System

To do this:	Press:
Soft boot reset, which clears system memory and reloads the operating system.	<Ctrl+Alt+Del>
Clear system memory, restart POST, and reload the operating system.	Reset button
Cold boot reset. Turn the system power off and then on. This clears system memory, restarts POST, reloads the operating system, and halts power to all peripherals.	Power off/on

### Initial System Startup

Problems that occur at initial system startup are usually caused by incorrect installation or configuration. Hardware failure is a less frequent cause.

#### Checklist

- Are the power supplies turned on? Check the switches on the back of the chassis.
- Are all cables correctly connected and secured?
- Are the processors fully seated in their slots on the server board?
- Are all add-in PCI boards fully seated in their slots on the server board?
- Are all jumper settings on the server board correct?
- Are all jumper and switch settings on add-in boards and peripheral devices correct? To check these settings, refer to the manufacturer's documentation that comes with them. If applicable, ensure that there are no conflicts—for example, two add-in boards sharing the same interrupt.
- Are all DIMMs installed correctly?
- Are all peripheral devices installed correctly?
- If the system has a hard disk drive, is it properly formatted or configured?
- Are all device drivers properly installed?
- Are the configuration settings made in BIOS Setup correct?
- Is the operating system properly loaded? Refer to the operating system documentation.
- Did you press the system power on/off switch on the front panel to turn the server on (power on light should be lit)?
- Is the system power cord properly connected to the system and plugged into a NEMA 5-15R outlet for 100-120 V~ or a NEMA 6-15R outlet for 200-240 V~?
- Is AC power available at the wall outlet?
- Are all integrated components from the tested components lists? Check the tested memory, and chassis lists, as well as the supported hardware and operating system list on the Intel Customer Support website.

# Running New Application Software

Problems that occur when you run new application software are usually related to the software. Faulty equipment is much less likely, especially if other software runs correctly.

## Checklist

- Does the system meet the minimum hardware requirements for the software? See the software documentation.
- Is the software an authorized copy? If not, get one; unauthorized copies often do not work.
- If you are running the software from a diskette, is it a good copy?
- If you are running the software from a CD-ROM disk, is the disk scratched or dirty?
- If you are running the software from a hard disk drive, is the software correctly installed? Were all necessary procedures followed and files installed?
- Are the correct device drivers installed?
- Is the software correctly configured for the system?
- Are you using the software correctly?

If the problems persist, contact the software vendor's customer service representative.

## After the System Has Been Running Correctly

Problems that occur after the system hardware and software have been running correctly may indicate equipment failure. Many situations that are easy to correct, however, can also cause such problems.

## Checklist

- If you are running the software from a diskette, try a new copy of the software.
- If you are running the software from a CD-ROM disk, try a different disk to see if the problem occurs on all disks.
- If you are running the software from a hard disk drive, try running it from a diskette. If the software runs correctly, there may be a problem with the copy on the hard disk drive. Reinstall the software on the hard disk, and try running it again. Make sure all necessary files are installed.
- If the problems are intermittent, there may be a loose cable, dirt in the keyboard (if keyboard input is incorrect), a marginal power supply, or other random component failures.
- If you suspect that a transient voltage spike, power outage, or brownout might have occurred, reload the software and try running it again. (Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and the system not responding to user commands.)

### ⇒ NOTE

**Random errors in data files:** If you are getting random errors in your data files, they may be getting corrupted by voltage spikes on your power line. If you are experiencing any of the above symptoms that might indicate voltage spikes on the power line, you may want to install a surge suppressor between the power outlet and the system power cord.

# More Problem Solving Procedures

This section provides a more detailed approach to identifying a problem and locating its source.

## Preparing the System for Diagnostic Testing



### CAUTION

**Turn off devices before disconnecting cables:** Before disconnecting any peripheral cables from the system, turn off the system and any external peripheral devices. Failure to do so can cause permanent damage to the system and/or the peripheral devices.

1. Turn off the system and all external peripheral devices. Disconnect all of them from the system, except the keyboard and video monitor.
2. Make sure the system power cord is plugged into a properly grounded AC outlet.
3. Make sure your video display monitor and keyboard are correctly connected to the system. Turn on the video monitor. Set its brightness and contrast controls to at least two thirds of their maximum ranges (see the documentation supplied with your video display monitor).
4. If the operating system normally loads from the hard disk drive, make sure there is no diskette in drive A. Otherwise, place a diskette containing the operating system files in drive A.
5. Turn on the system. If the power LED does not light, see “Power Light Does Not Light” on page 114.

## Monitoring POST

The server may start to beep while booting. These beeps identify system events. The following gives a description of possible beep codes.

**Table 32. Beep Codes**

Beep Code	Description
1	One short beep before boot (this is normal, not an error)
1-2	Search for option ROMs. One long, two short beeps on checksum failure
1-2-2-3	BIOS ROM checksum
1-3-1-1	Test DRAM refresh
1-3-1-3	Test 8742 Keyboard Controller
1-3-3-1	Auto size DRAM, system BIOS stops execution here if the BIOS does not detect any usable memory DIMMs
1-3-4-1	Base RAM failure; BIOS stops execution here if entire memory is bad
2-1-2-3	Check ROM copyright notice
2-2-3-1	Test for unexpected interrupts

For additional information regarding monitoring POST, see Chapter 3.

## Verifying Proper Operation of Key System Lights

As POST determines the system configuration, it tests for the presence of each mass storage device installed in the system. As each device is checked, its activity light should turn on briefly. Check for the following:

- Does the diskette drive activity light turn on briefly? If not, see “Diskette Drive Activity Light Does Not Light” on page 116.
- If a second diskette drive is installed, does its activity light turn on briefly? If not, see “Diskette Drive Activity Light Does Not Light” on page 116.

## Confirming Loading of the Operating System

Once the system boots up, the operating system prompt appears on the screen. The prompt varies according to the operating system. If the operating system prompt does not appear, see “Initial System Startup” on page 111.

## Specific Problems and Corrective Actions

This section provides possible solutions for these specific problems:

- Power light does not light
- There is no beep or an incorrect beep pattern
- No characters appear on screen
- Characters on the screen appear distorted or incorrect
- System cooling fans do not rotate
- Diskette drive activity light does not light
- CD-ROM drive activity light does not light
- There are problems with application software
- The bootable CD-ROM is not detected

Try the solutions in the order given. If you cannot correct the problem, contact your service representative or authorized dealer for help.

## Power Light Does Not Light

Check the following:

- Is the system operating normally? If so, the power LED may be defective or the cable from the front panel to the server board is loose.
- Are there other problems with the system? If so, check the items listed under “System Cooling Fans Do Not Rotate Properly”.

If all items are correct and problems persist, contact your service representative or authorized dealer for help.

## No Characters Appear on Screen

Check the following:

- Is the keyboard functioning? Check to see that the “Num Lock” light is functioning.
- Is the video monitor plugged in and turned on?
- Are the brightness and contrast controls on the video monitor properly adjusted?
- Are the video monitor switch settings correct?
- Is the video monitor signal cable properly installed?
- Is the onboard video controller enabled?

If you are using an add-in video controller board, do the following:

1. Verify that the video controller board is fully seated in the server board connector.
2. Reboot the system for changes to take effect.
3. If there are still no characters on the screen after you reboot the system and POST emits a beep code, write down the beep code you hear. This information is useful for your service representative.
4. If you do not receive a beep code and characters do not appear, the video display monitor or video controller may have failed. Contact your service representative or authorized dealer for help.

## Characters Are Distorted or Incorrect

Check the following:

- Are the brightness and contrast controls properly adjusted on the video monitor? See the manufacturer’s documentation.
- Are the video monitor signal and power cables properly installed?

If the problem persists, the video monitor may be faulty or it may be the incorrect type. Contact your service representative or authorized dealer for help.

## System Cooling Fans Do Not Rotate Properly

If the system cooling fans are not operating properly, system components could be damaged.

Check the following:

- Is AC power available at the wall outlet?
- Is the system power cord properly connected to the system and the wall outlet?
- Did you press the power button?
- Is the power on light lit?
- Have any of the fan motors stopped (use the server management subsystem to check the fan status)?
- Are the fan power connectors properly connected to the server board?
- Is the cable from the front panel board connected to the server board?
- Are the power supply cables properly connected to the server board?
- Are there any shorted wires caused by pinched cables or power connector plugs forced into power connector sockets the wrong way?

If the switches and connections are correct and AC power is available at the wall outlet, contact your service representative or authorized dealer for help.

## Diskette Drive Activity Light Does Not Light

Check the following:

- Are the diskette drive's power and signal cables properly installed?
- Are all relevant switches and jumpers on the diskette drive set correctly?
- Is the diskette drive properly configured?
- Is the diskette drive activity light always on? If so, the signal cable may be plugged in incorrectly.

If you are using the onboard diskette controller, use the Setup Utility to make sure that "Onboard Floppy" is set to "Enabled". If you are using an add-in diskette controller, make sure that "Onboard Floppy" is set to "Disabled".

If the problem persists, there may be a problem with the diskette drive, server board, or drive signal cable. Contact your service representative or authorized dealer for help.

## Hard Disk Drive Activity Light Does Not Light

The hard disk drive activity light is not connected to the server board SE7501HG2.

## CD-ROM Drive Activity Light Does Not Light

Check the following:

- Are the CD-ROM drive's power and signal cables properly installed?
- Are all relevant switches and jumpers on the drive set correctly?
- Is the drive properly configured?
- Is the onboard IDE controller enabled?

## Cannot Connect to a Server

- Make sure you are using the drivers that are shipped on the system Configuration Software CD for the onboard network controller.
- Make sure the driver is loaded and the protocols are bound.
- Make sure the network cable is securely attached to the connector at the system back panel. If the cable is attached but the problem persists, try a different cable.
- Make sure the hub port is configured for the same duplex mode as the network controller.
- Check with your LAN administrator about the correct networking software that needs to be installed.
- If you are directly connecting two servers (no hub), you will need a crossover cable (see your hub documentation for more information on crossover cables).
- Check the network controller LEDs that are visible through an opening at the system back panel.

## Problems with Network

**The server hangs when the drivers are loaded.**

- Change the PCI BIOS interrupt settings. Try the "PCI Installation Tips" below.

**Diagnostics pass, but the connection fails.**

- Make sure the network cable is securely attached.
- Make sure you specify the correct frame type in your NET.CFG file.

**The controller stopped working when an add-in adapter was installed.**

- Make sure the cable is connected to the port from the onboard network controller.
- Make sure your PCI BIOS is current. Try the "PCI Installation Tips" below.
- Make sure the other adapter supports shared interrupts. Also, make sure your operating system supports shared interrupts.
- Try reseating the add-in adapter.

**The add-in adapter stopped working without apparent cause.**

- Try reseating the adapter first; then try a different slot if necessary.
- The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.
- Run the diagnostics.

## PCI Installation Tips

Some common PCI tips are listed here.

- Certain drivers may require interrupts that are not shared with other PCI drivers. The SSU can be used to adjust the interrupt numbers for PCI devices. For certain drivers, it may be necessary to alter settings so that interrupts are not shared.

## Problems with Application Software

If you have problems with application software, do the following:

- Verify that the software is properly configured for the system. See the software installation and operation documentation for instructions on setting up and using the software.
- Try a different copy of the software to see if the problem is with the copy you are using.
- Make sure all cables are installed correctly.
- Verify that the server board jumpers are set correctly. See Chapter 7.
- If other software runs correctly on the system, contact your vendor about the failing software.

If the problem persists, contact the software vendor's customer service representative for help.

## Bootable CD-ROM Is Not Detected

Check the following:

- Is the BIOS set to allow the CD-ROM to be the first bootable device?

# Recovering the BIOS

In the rare event that the BIOS becomes damaged a recovery process needs to be followed to return the system to serviceability. The steps below explain the BIOS recovery procedure.

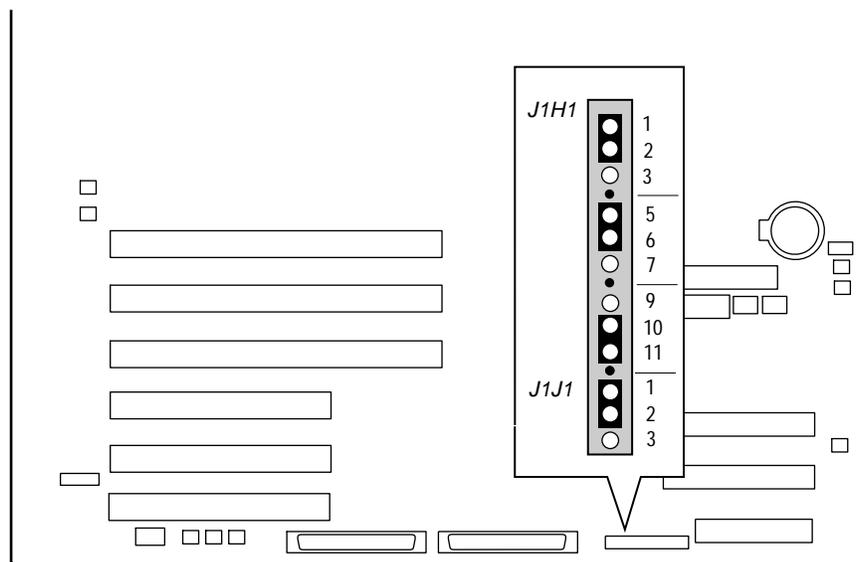
## ⇒ NOTE

This is the mode of last resort, used only when the main system BIOS will not come up.

Recovery mode requires at least 4 MB of RAM, and drive A: must be configured to support and boot from a 3.5" 1.44 MB floppy drive.

Because of the small amount of code available in the non-erasable boot block area, there is no video support; you will not see anything on the screen during the procedure. Monitor the procedure by listening to the speaker. One high-pitched beep announces the start of the recovery process. The entire process takes two to four minutes. A successful update ends with two high-pitched beeps. Failure is indicated by a long series of short beeps. If the recovery disk is not bootable or if you do not insert the recovery disk, you will hear three beeps, after which the system will halt.

1. Create a bootable diskette that contains the BIOS update file and the iFLASH.EXE utility. This is available from:  
<http://support.intel.com/support/motherboards/server/SE7501HG2>
2. Turn off the system power and disconnect the AC power.
3. Place a jumper onto J1H1 pins 9-10 (BIOS recovery) as shown in the figure below



TP00034

**Figure 32. BIOS Recovery Jumper**

4. Insert the BIOS Recovery floppy diskette into the disk drive.
5. Replace the AC power cord and turn on the system power.

The system will beep once as the recovery process starts and the system passes control to DOS. DOS executes a special AUTOEXEC.BAT file that contains iFLASH on the first line. If iFLASH determines that the system is in recovery mode, as indicated by the jumper location, iFLASH will start the recovery. No user intervention is needed.

The BIOS recovery will take between two and four minutes. The screen will remain blank while the recovery is performed. At the end of the BIOS Recovery, two high-pitched beeps will sound and the floppy drive access light will turn off. The BIOS Recovery may take several minutes to complete. When the BIOS Recovery is complete, it is safe to power off the system.

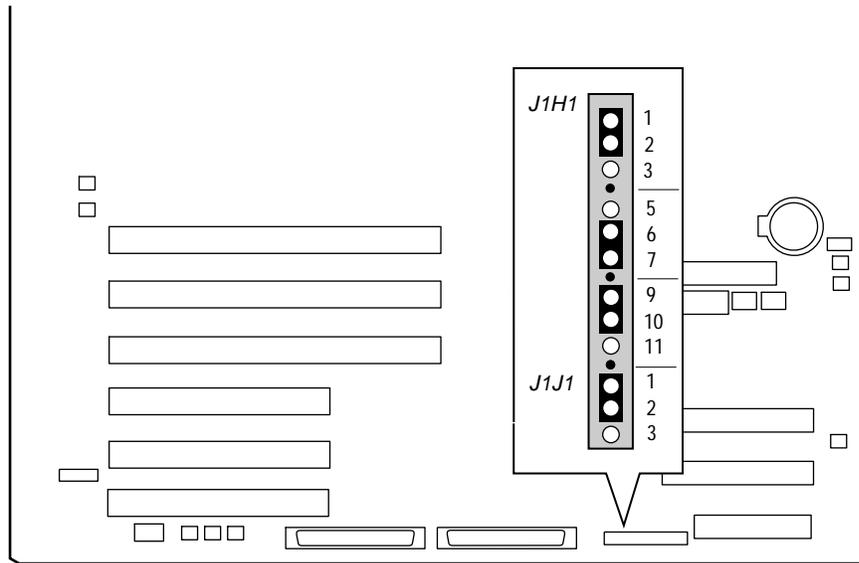
When the flash update completes:

1. Turn off the system power and remove the AC power.
2. Remove the recovery diskette.
3. Restore the BIOS recovery jumper to its original position, covering pins 9 and 10.
4. Close the server chassis.
5. Replace the AC power and turn on the system power.
6. Re-flash any custom blocks, such as user binary or language blocks.

# Clearing the Password with the Password Jumper

If the user or administrator password(s) is lost or forgotten, moving the password clear jumper into the “clear” position clears both passwords. The password clear jumper must be restored to its original position before a new password(s) can be set. The password clear jumper is located on jumper block J1H1 on the SE7501HG2 board.

1. Power down the system and disconnect the AC power.
2. Open the server chassis.
3. Move the Password Clear jumper to the Erase position, covering pins 6 and 7 as indicated in the following diagram.



TP00032

**Figure 33. Password Recovery Jumper**

4. Reconnect the AC power, power up the system.
5. Power down the system and disconnect the AC power.
6. Return the Password Clear jumper to its original position, covering pins 5 and 6.
7. Close the server chassis.

# Clearing the CMOS

If you are not able to access the BIOS setup screens, the CMOS may need to be cleared. One of two methods can be used to clear the CMOS: using a CMOS clear button sequence from the front panel or using the CMOS clear jumper on the system board. Each of these methods is described below.

## Clearing CMOS with the Front Panel Buttons

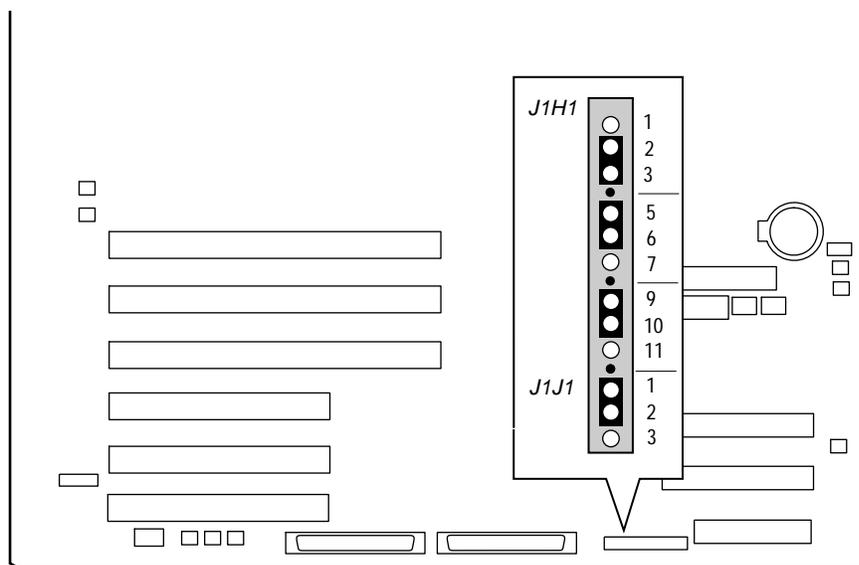
Use the following steps to reset the CMOS by using the buttons on the front panel:

1. Power off the system, leaving the AC power connected.
2. Hold down the reset button for at least four seconds. Leave the button depressed while continuing with the next step.
3. With the reset button still depressed, press the on/off power button.
4. At the same time, release both the on/off power button and the reset button.

## Clearing CMOS with the CMOS Jumper

You can also reset the CMOS by moving a jumper on jumper block J1H1 of the system board. Use the following steps to reset the CMOS by using the jumper.

1. Power down the system and disconnect the AC power.
2. Open the server.
3. Move the CMOS Clear jumper to the Force Erase position, covering pins 2 and 3 as indicated in the following diagram.



TP00033

Figure 34. CMOS Recovery Jumper

4. Reconnect the AC power, power up the system.
5. Press F2 and enter the BIOS Setup Utility. When BIOS Setup is loaded, press the F9 key and Enter to return the parameters to the default values.
6. Modify any BIOS Setup values according to the desired system configuration.
7. Press F10 and Enter to exit BIOS Setup and save changes.
8. Power down the system and disconnect the AC power.
9. Return the CMOS Clear jumper to its original position, covering pins 1 and 2.
10. Close the server chassis.



# 6 Getting Help

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## World Wide Web

<http://support.intel.com/support/motherboards/server/SE7501HG2>

## Telephone

All calls are billed US \$25.00 per incident, levied in local currency at the applicable credit card exchange rate plus applicable taxes.

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<b>In U.S. and Canada</b>		1-800-404-2284	
<b>In Europe</b>			
UK	0870 6072439	Finland	9 693 79297
France	01 41 918529	Denmark	38 487077
Germany	069 9509 6099	Norway	23 1620 50
Italy	02 696 33276	Sweden	08 445 1251
Spain	91 377 8166	Holland	020 487 4562
<b>In Asia-Pacific region</b>			
Australia	1800 649931	Indonesian	001-803 65 7249
Hong Kong	852 2 844 4456	Malaysia	1-800 80 1390
Korea	822 767 2595	New Zealand	0800 444 365
PRC	800 820 1100	Pakistan	632 6368415
Singapore	65 831-1311	Philippines	1-800 1 651 0117
Taiwan	2 2718 9915	Thailand	001-800 6310003
India	0006517-2-830 3634	Vietnam	632 6368416
<b>In Japan</b>			
0120-868686 (Domestic)		81-298-47-0800 (outside country)	
<b>In Latin America</b>			
Brazil	0021-0811-408-5540	Ecuador	999-119, 800-628-8686 (via AT&T)
Mexico	001-800-628-8686	Guatemala	99-99-190, 800-628-8686 (via AT&T)
Colombia	980-9-122-118	Venezuela	800-11-120, 800-628-8686 (via AT&T)
Costa Rica	0-800-011-0395	Argentina	001-800-222-1001, 800-628-8686 (via AT&T)
Panama	001-800-628-8686	Paraguay	008-11, 800-628-8686 (via AT&T)
Chile	800-532-992	Peru	0-800-50000, 800-628-8686 (via AT&T)
Miami	1-800-621-8423	Uruguay	000-410, 800-628-8686 (via AT&T)

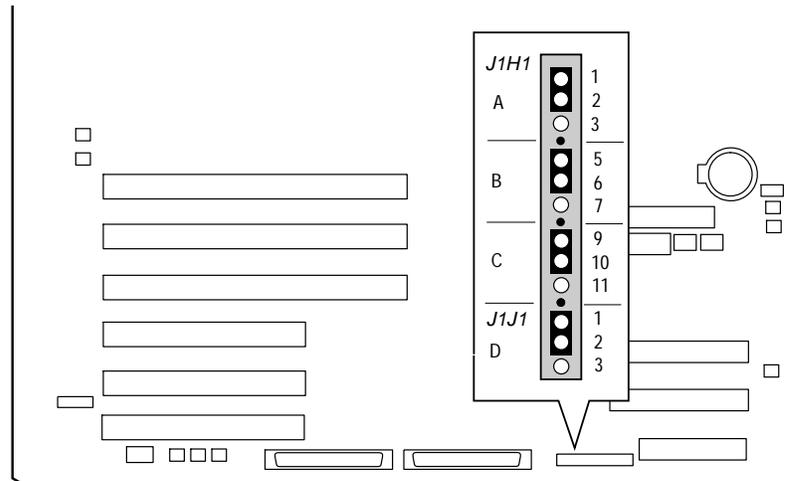
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For an updated support contact list, please see <http://www.intel.com/support/9089.htm>



# 7 Technical Reference

## Server Board Jumpers



TP00035

Figure 35. Jumper Locations

Table 33. Configuration Jumper (J1H1)

Figure Letter	Jumper Name	Pins	What happens at system reset
A	CMOS normal operation	1-2	These pins are for normal operation.
	CMOS clear	2-3	If these pins are jumpered, the CMOS settings will be cleared on the next reset. These pins should <b>not</b> be jumpered for normal operation.
B	Password normal operation	5-6	These pins are for normal operation.
	Password Clear	6-7	If these pins are jumpered, the password will be cleared on the next reset. These pins should <b>not</b> be jumpered for normal operation.
C	BIOS normal operation	9-10	These pins are for normal operation.
	BIOS Recovery	10-11	If these pins are jumpered, the system will attempt BIOS recovery. These pins should <b>not</b> be jumpered for normal operation.

Table 34. Configuration Jumper (J1J1)

Figure Letter	Jumper Name	Pins	What happens at system reset
D	BMC normal operation	1-2	These pins are for normal operation.
	BMC Flash EN	2-3	If these pins are jumpered, the system will allow the BMC Flash to be overwritten by the firmware update utility.



# 8 Regulatory and Integration Information

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## Product Regulatory Compliance

### Product Safety Compliance

The SE7501HG2 complies with the following safety requirements:

- UL 1950 - CSA 950 (US/Canada)
- EN 60 950 (European Union)
- IEC60 950 (International)
- CE – Low Voltage Directive (73/23/EEC) (European Union)
- EMKO-TSE (74-SEC) 207/94 (Nordics)
- GOST R 50377-92 (Russia)

### Product EMC Compliance

The SE7501HG2 has been tested and verified to comply with the following electromagnetic compatibility (EMC) regulations when installed a compatible Intel host system. For information on compatible host system(s) refer to Intel's Server Builder website or contact your local Intel representative.

- FCC (Class A Verification) – Radiated & Conducted Emissions (USA)
- ICES-003 (Class A) – Radiated & Conducted Emissions (Canada)
- CISPR 22, 3<sup>rd</sup> Edition (Class A) – Radiated & Conducted Emissions (International)
- EN55022 (Class A) – Radiated & Conducted Emissions (European Union)
- EN55024 (Immunity) (European Union)
- CE – EMC Directive (89/336/EEC) (European Union)
- VCCI (Class A) – Radiated & Conducted Emissions (Japan)
- AS/NZS 3548 (Class A) – Radiated & Conducted Emissions (Australia / New Zealand)
- RRL (Class A) Radiated & Conducted Emissions (Korea)
- BSMI (Class A) Radiated & Conducted Emissions (Taiwan)
- GOST R 29216-91 (Class A) Radiated & Conducted Emissions (Russia)
- GOST R 50628-95 (Immunity) (Russia)

## Product Regulatory Compliance Markings

This product is marked with the following Product Certification Markings:

UL Recognition Mark	
CE Mark	
Russian GOST Mark	
Australian C-Tick Mark	
BSMI DOC Marking	
BSMI EMC Warning	<div style="border: 1px solid black; padding: 5px;"> <p>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</p> </div>
RRL MIC Mark	

# Electromagnetic Compatibility Notices

## FCC (USA)

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

For questions related to the EMC performance of this product, contact:

Intel Corporation  
5200 N.E. Elam Young Parkway  
Hillsboro, OR 97124  
1-800-628-8686

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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals, that are not shielded and grounded may result in interference to radio and TV reception.

## Industry Canada (ICES-003)

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.

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

## Europe (CE Declaration of Conformity)

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

## Taiwan Declaration of Conformity

This product has been tested and complies with CNS13438. The product has been marked with the BSMI DOC mark to illustrate compliance.

## Korean RRL Compliance

This product has been tested and complies with MIC Notices No. 1997-41 and 1997-42. The product has been marked with the MIC logo to illustrate compliance.



1. 기기의 명칭(모델명) :
2. 인증번호 :
3. 인증받은 자의 상호 :
4. 제조년월일 :
5. 제조자/제조국가 :

The English translation for the above is as follows:

1. Type of Equipment (Model Name): SE7501HG2
2. Certification No.: Contact Intel Representative
3. Name of Certification Recipient: Intel
4. Date of Manufacturer: Marked on Product
5. Manufacturer / Nation : Intel

## Australia / New Zealand

This product has been tested and complies with AS/NZS 3548. The product has been marked with the C-Tick mark to illustrate compliance.

## 9 Equipment Log Worksheet

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### Equipment Log

Use the blank equipment log provided here to record information about your system. You will need some of this information when you run the SSU.

<b>Item</b>	<b>Manufacturer Name and Model Number</b>	<b>Serial Number</b>	<b>Date Installed</b>
System			
Server Board			
Primary Processor Speed and Cache			
Secondary Processor Speed and Cache			
Video Display			
Keyboard			
Mouse			
Diskette Drive A			
Diskette Drive B			
Tape Drive			
CD-ROM Drive			
Hard Disk Drive 1			
Hard Disk Drive 2			
Hard Disk Drive 3			
Hard Disk Drive 4			
Hard Disk Drive 5			

continued



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