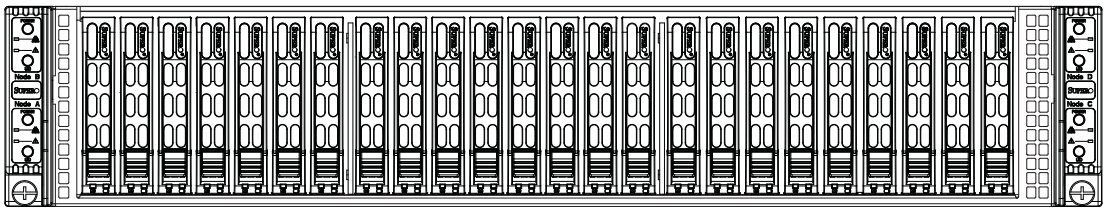
SUPERMICRO®

2U Twin²™
SuperServer 2016Ti-HTRF



USER'S MANUAL

Revision 1.0

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 2016Ti-HTRF. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 2016Ti-HTRF is a 2U Twin^2 (two serverboards/nodes in a 2U chassis) rackmount server based on the SC217HQ-R920B server chassis and four Super X8SiT-HF serverboards.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the Super X8SiT-HF serverboard and the SC217HQ-R920B chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 2016Ti-HTRF into a rack and check out the server configuration prior to powering up the system. If your server was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer to this chapter for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 2016Ti-HTRF.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X8SiT-HF serverboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter

when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC217HQ-R920B 2U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: POST Error Beep Codes

Appendix B: BIOS Recovery

Appendix C: System Specifications

Notes

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Chapter 1

Introduction

1-1 Overview

The Supermicro SuperServer 2016Ti-HTRF is "2U Twin^2" server composed of the SC217HQ-R920B chassis and four X8SiT-HF motherboards. Please refer to our web site for information on operating systems that have been certified for use with the 2016Ti-HTRF.

In addition to the mainboard and chassis, various hardware components may have been included with the 2016Ti-HTRF, as listed below.

- Four passive CPU heatsinks (SNK-P0046P)
- Four riser cards for PCI-E x16 add-on cards (RSC-R1U-E16R)
- Four 8-cm PWM fans (FAN-0111L4)
- SATA Accessories:
  Twelve 2.5" hard drive carriers (MCP-220-00075-0B)
  One SATA backplane (BPN-SAS-827HQ)
  Four SATA cables (CBL-0317L)
- One CD containing drivers and utilities
- SuperServer 2016Ti-HTRF User's Manual

1-2 Motherboard Features

At the heart of the SuperServer 2016Ti-HTRF are four X8SiT-HF single processor motherboards based upon Intel's 3420 chipset. Below are the main features of the X8SiT-HF. Note that the features on each board are quadrupled for the server, which includes four nodes.

Processor

Each X8SiT-HF supports single Intel® Xeon® 3400 and L3400 Series, Core™ i3 and Pentium® G6950 processors (LGA1156 socket). Please refer to our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X8SiT-HF has six DIMM slots that can support up to 16 GB of UDIMM or up to 32GB of RDIMM DDR3-1333/1066/800 MHz ECC memory only.

Onboard SATA

A SATA controller is built into the chipset to provide support for a six port, 3 Gb/sec Serial ATA subsystem, which is RAID 0, 1, 5 (Windows only) and 10 compatible.

PCI Expansion Slots

The X8SiT-HF has one PCI-Express 2.0 x16 slot. Riser cards are included for use.

Onboard Controllers/Ports

An onboard IDE controller supports two IDE devices. Onboard I/O backpanel ports include one COM port, a VGA port, PS/2 mouse and keyboard ports, two Gb LAN ports, a dedicated IPMI LAN port and two USB ports. Extra USB ports are included on the motherboard.

Other Features

Other onboard features that promote system health include voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors and BIOS rescue.

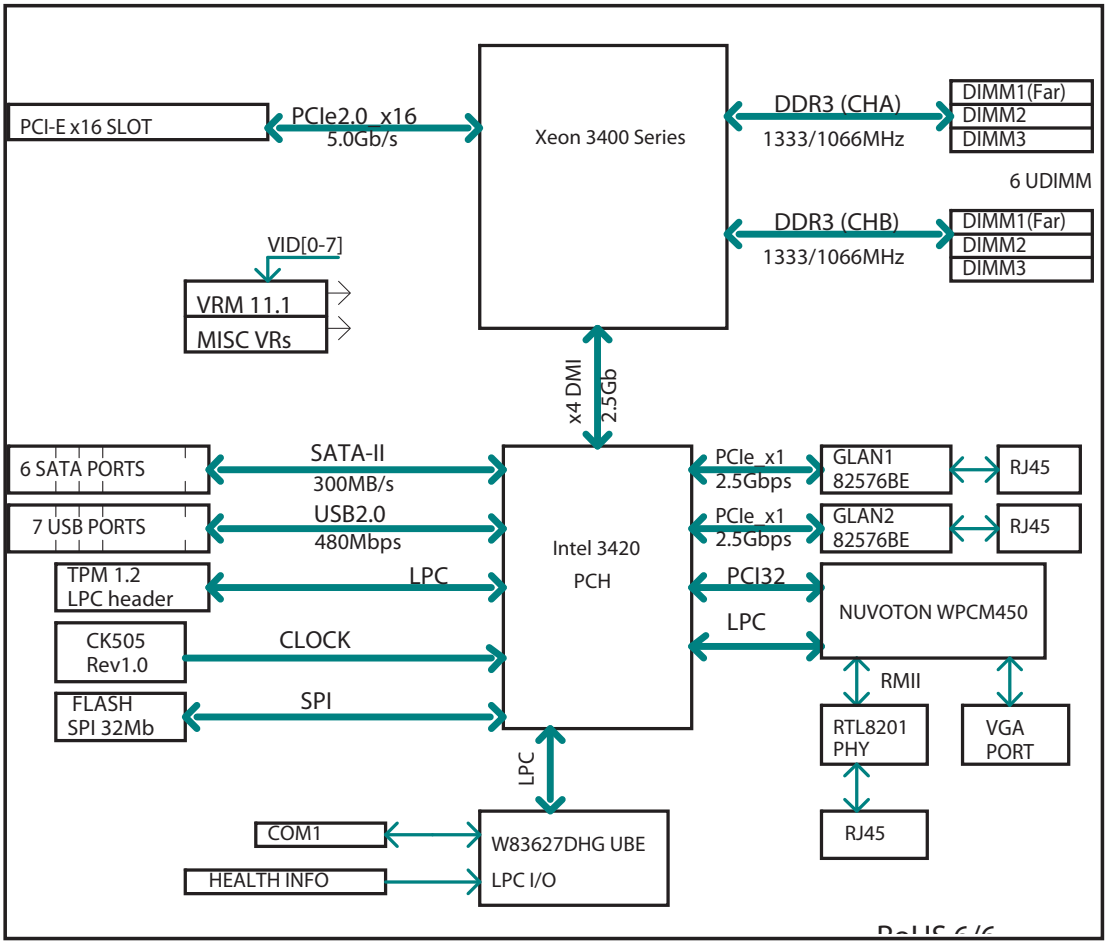

Figure 1-1. Intel 3420 Chipset: System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.

1-3 Server Chassis Features

The following is a general outline of the main features of the SC217HQ-R920B 2U chassis. Details on the chassis can be found in Chapter 6.

System Power

The SC217HQ-R920B includes a redundant (dual) 920W power supply, which provides power to both serverboards (nodes). If either power supply failes, the other will allow the system to continue to run.

SATA Subsystem

The SC217HQ-R920B chassis was designed to support 24 SATA hard drives, which are hot-swappable units. There are six hard drives per node in the system.

Control Panel

The SC217HQ-R920B features four independant control panels. Each control panel has LEDs to indicate power on, network activity, power fail, fan fail, system overheat conditions and the UID LED for it's own specific node. Each control panel also includes a main power button and a UID button.

Rear I/O Panel

The SC217HQ-R920B is a 2U rackmount chassis. Its I/O panel provides slots for four low-profile PCI Express x16 expansion cards, four COM ports, eight USB ports, four VGA ports and eight Gb Ethernet ports. See Chapter 6 for details.

Cooling System

The SC217HQ-R920B chassis has an innovative cooling design that features four 8-cm high-performance fans. A fan speed control setting in BIOS allows fan speed to be determined by system temperature. See Chapter 6 for details.

1-4 2U Twin²: System Notes

As a 2U Twin² configuration, the 2016Ti-HTRF is a unique server system. With four system boards incorporated into a single chassis acting as four separate nodes, there are several points you should keep in mind.

Nodes

Each of the serverboards act as a separate node in the system. As independant nodes, each may be powered off and on without affecting the others. In addition, each node is a hot-swappable unit that may be removed from the rear of the chassis. The nodes are connected to the server backplane by means of an adapter card.

System Power

The server has an additional 920W power supply module (two total) for power redundancy. If a power supply module fails the other backup module will keep the system running until it can be replaced.

SATA Backplane/Drives

As a system, the 2016Ti-HTRF supports the use of 24 SATA drives. A single backplane works to apply system-based control for power and fan speed functions, yet at the same time logically connects a set of six drives to each serverboard. Consequently, RAID setup is limited to a six-drive scheme (RAID cannot be spread across all 24 drives). See the *Drive Bay Installation/Removal* section in Chapter 6 for the logical hard drive and node configuration.

1-5 Contacting Supermicro

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Web Site:	www.supermicro.com.tw
Technical Support:	
Email:	support@supermicro.com.tw
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Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get the 2016Ti-HTRF up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the system was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the server. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the server was shipped in should include the rackmount hardware needed to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.
- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).
- This product is not suitable for use with visual display work place devices according to §2 of the the German Ordinance for Work with Visual Display Units.

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from it.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.

- Allow the hot plug hard drives and power supply modules to cool before touching them.

- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

- Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

Removing the Protective Film

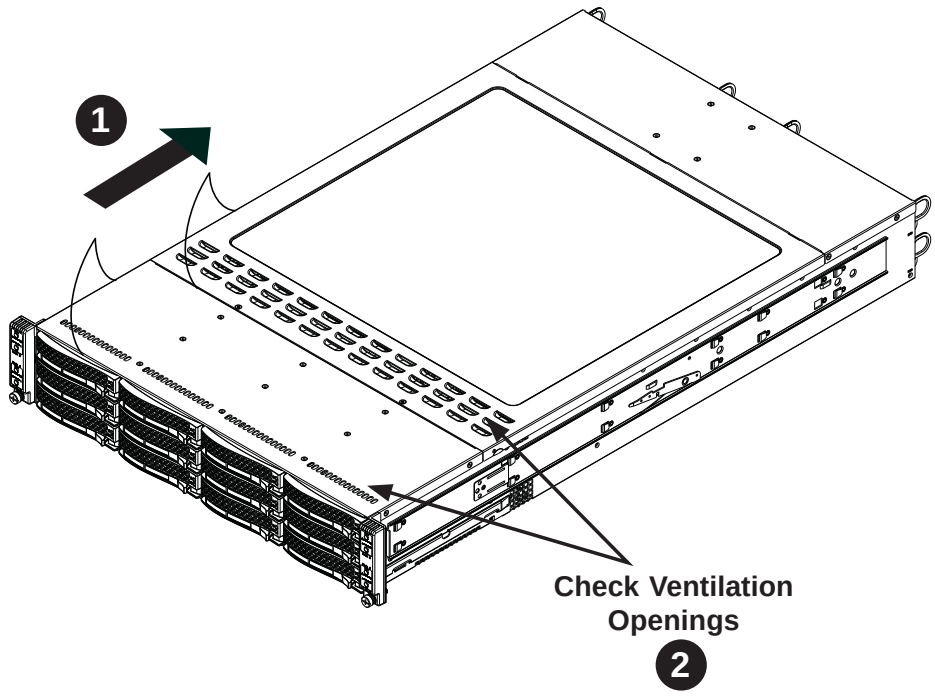
Before operating the server for the first time, it is important to remove the protective film covering the top of the chassis, in order to allow for proper ventilation and cooling.

Removing the Protective Film

1. Peel off the protective film covering the top cover and the top of the chassis

2. Check that all ventilation openings on the top cover and the top of the chassis are clear and unobstructed.

Figure 2-1: Removing the Protective Film



Warning: Except for short periods of time, do NOT operate the server without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

2-4 Rack Mounting Instructions

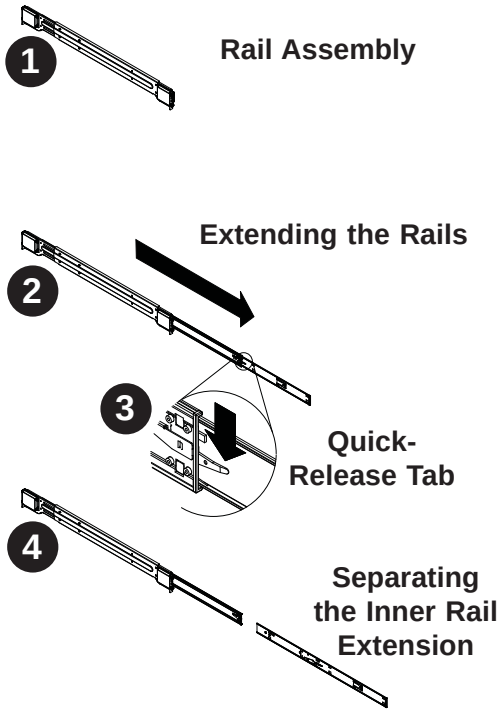
This section provides information on installing the SC217 chassis into a rack unit with the quick-release rails provided. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

Note: This rail will fit a rack between 26" and 33.5" deep.

Separating the Sections of the Rack Rails

The chassis package includes two rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.

Figure 2-2. Separating the Rack Rails



Separating the Inner and Outer Rails

1. Locate the rail assembly in the chassis packaging.
2. Extend the rail assembly by pulling it outward.
3. Press the quick-release tab.
4. Separate the inner rail extension from the outer rail assembly.

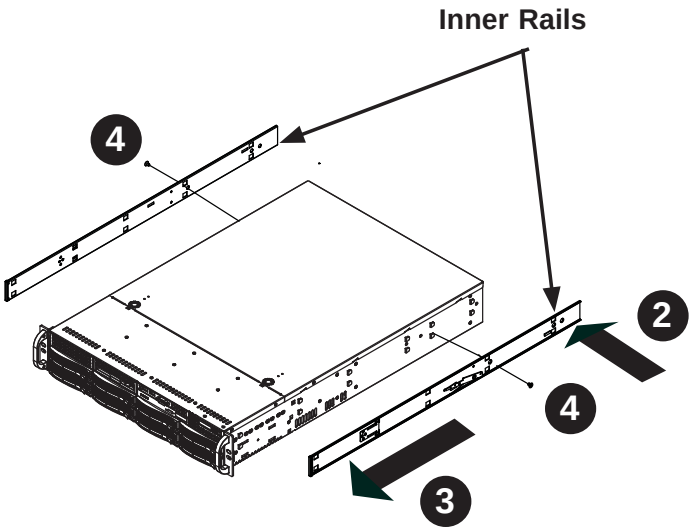


Figure 6-3: Installing the Inner Rails

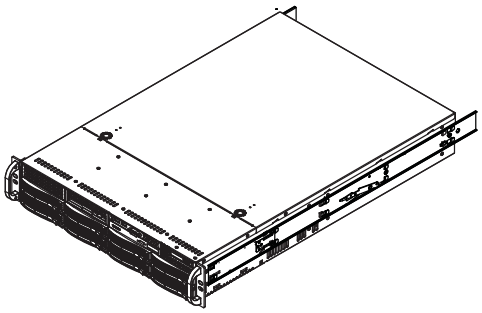


Figure 2-3: Installing the Inner Rails

Installing The Inner Rails on the Chassis

Installing the Inner Rails

1. Confirm that the left and right inner rails have been correctly identified.

2. Place the inner rail firmly against the side of the chassis, aligning the hooks on the side of the chassis with the holes in the inner rail.

3. Slide the inner rail forward toward the front of the chassis until the rail clicks into the locked position, which secures the inner rail to the chassis.

4. Secure the inner rail to the chassis with the screws provided.

5. Repeat steps 1 through 4 above for the other inner rail.

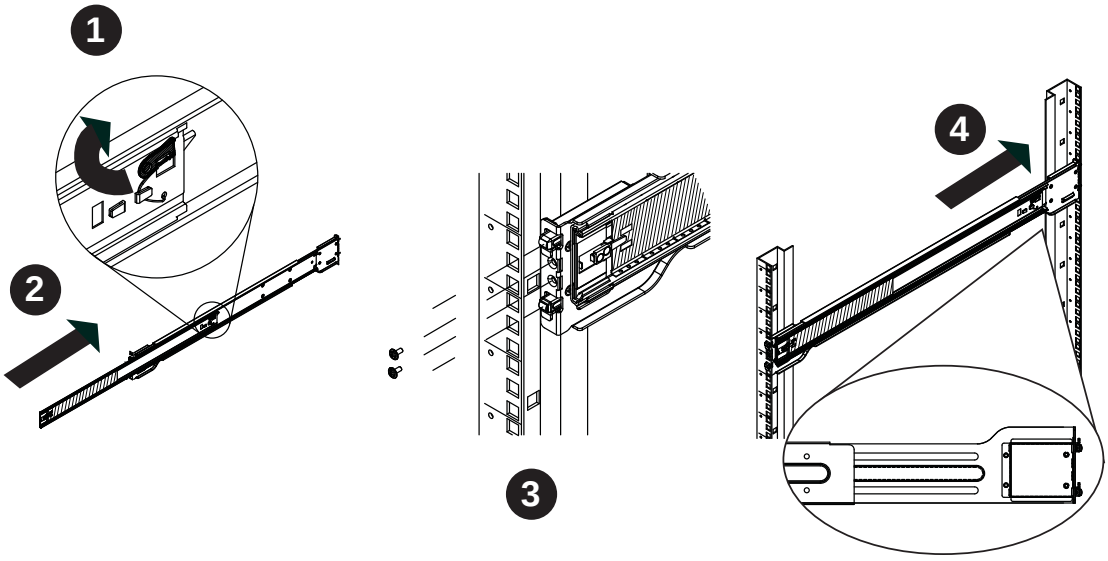


Figure 6-5: Extending and Releasing the Outer Rails

Installing the Outer Rails on the Rack

Installing the Outer Rails

1. Press upward on the locking tab at the rear end of the middle rail.

2. Push the middle rail back into the outer rail.

3. Hang the hooks of the front of the outer rail onto the slots on the front of the rack. If necessary, use screws to secure the outer rails to the rack, as illustrated above.

4. Pull out the rear of the outer rail, adjusting the length until it fits within the posts of the rack.

5. Hang the hooks of the rear portion of the outer rail onto the slots on the rear of the rack. If necessary, use screws to secure the rear of the outer rail to the rear of the rack.

6. Repeat steps 1-5 for the remaining outer rail.

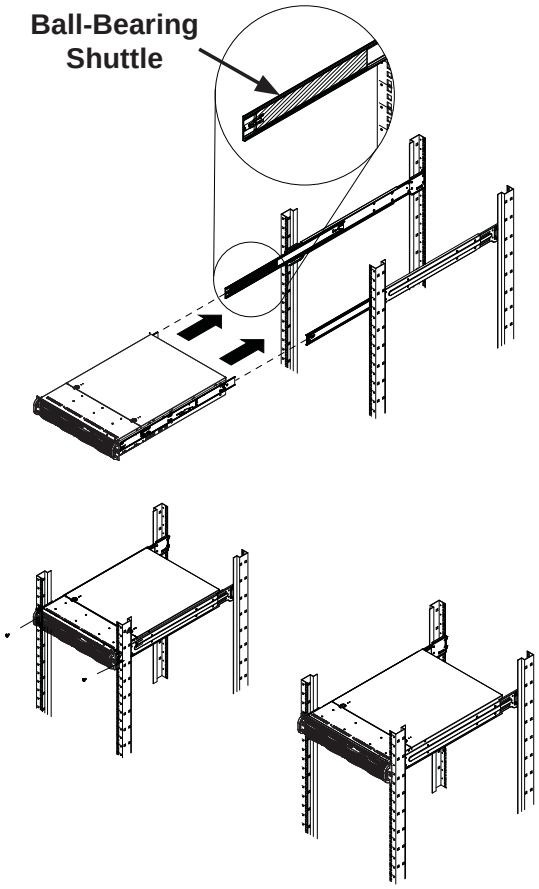


Figure 6-6: Installing into a Rack

Standard Chassis Installation

Installing the Chassis into a Rack

1. Confirm that the inner rails are properly installed on the chassis.

2. Confirm that the outer rails are correctly installed on the rack.

3. Pull the middle rail out from the front of the outer rail and make sure that the ball-bearing shuttle is at the front locking position of the middle rail.

4. Align the chassis inner rails with the front of the middle rails.

5. Slide the inner rails on the chassis into the middle rails, keeping the pressure even on both sides, until the locking tab of the inner rail clicks into the front of the middle rail, locking the chassis into the fully extended position.

6. Depress the locking tabs of both sides at the same time and push the chassis all the way into the rear of the rack.

7. If necessary for security purposes, use screws to secure the chassis handles to the front of the rack.

2-5 Checking the Serverboard Setup

After you install the system in the rack, you will need to access the inside of the nodes to make sure the serverboard is properly installed.

Accessing the Inside of a Node (Figure 2-6)

1. Make sure the protective film on the cover has been removed as described in the previous section.

2. Before removing a node, unplug all the cables that connect to that node.

3. To remove a node, first push the two latches (located near the handles) inward.

4. Grasp the handles and pull the node out from the rear of the chassis.

5. To remove the system from the rack completely, depress the locking tabs in the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position.

Checking the Components and Setup

1. You may have one or two processors already installed in each of the four serverboards. Each processor needs its own heatsink. See Chapter 5 for instructions on processor and heatsink installation.

2. Your server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

3. You can install four add-on cards to the system (one for each node). See Chapter 5 for details on installing PCI add-on cards.

4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

2-6 Preparing to Power On

Next, you should check to make sure the hard drives and the backplane have been properly installed and all connections have been made.

Checking the Hard Drives

1. The hard disk drives are accessable from the front of the server and can be installed and removed from the front of the chassis without removing the top chassis cover.

2. Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install hard drives, please refer to Chapter 6.

Checking the Airflow

1. Airflow is provided by four 8-cm PWM fans and (for each serverboard) one air shroud. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

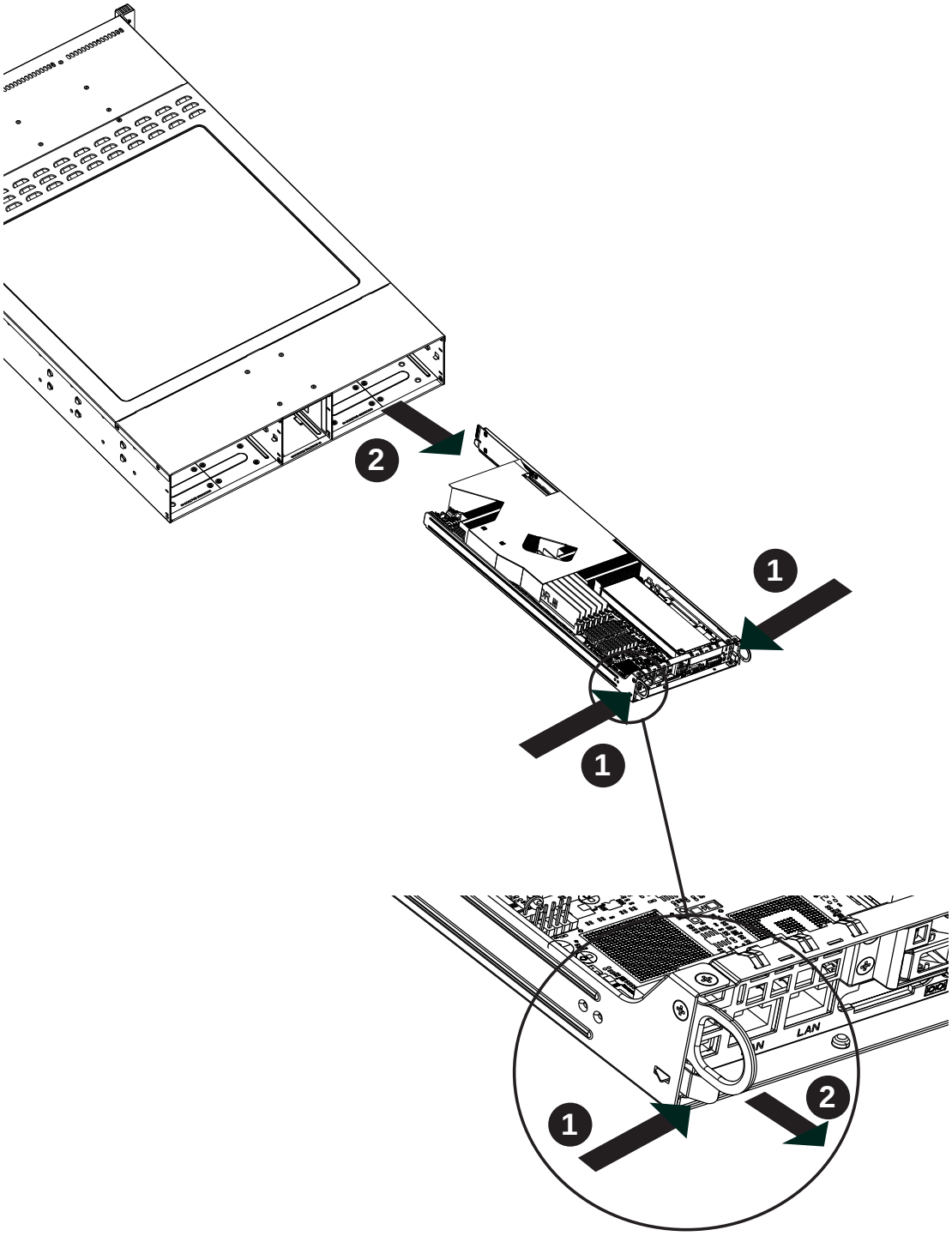
Providing Power

1. Plug the power cords from the power supplies unit into a high-quality power strip that offers protection from electrical noise and power surges.

2. It is recommended that you use an uninterruptible power supply (UPS).

3. Finally, depress the power on button on the front of the chassis.

Figure 2-6. Removing a Node from the System



Notes

Chapter 3

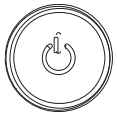
System Interface

3-1 Overview

There are LEDs on the control panels and on the hard drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on each control panel. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take. Note that the server has four control panels, one for each serverboard (node) installed in the system. This allows each node to be controlled independently of the other.

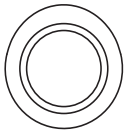
3-2 Control Panel Buttons

There are two push-buttons located on each control panel: a power on/off button and a UID button.



Power

This is the main power button, which is used to apply or turn off the main system power only to the node it is connected to. Depressing this button removes the main power but keeps standby power supplied to the serverboard. Therefore, you must unplug the AC power cord from any external power source before servicing. This button has an LED built into it, which will illuminate when its node is powered on.



UID

Depressing the UID (unit identifier) button illuminates an LED on both the front and rear of the chassis for easy system location in large stack configurations. The LED will remain on until the button is pushed a second time. Another UID button on the rear of the chassis serves the same function. This button has an LED built into it, which will illuminate when either the front or rear UID button is pushed.

3-3 Control Panel LEDs

In addition to the LEDs built into the power and UID buttons, each of the four control panels located on the front of the SC217 chassis has two LEDs that provide you with critical information related their own node. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

Alert LED

This LED is illuminated when an alert condition occurs. A solid red light indicates an overheat condition in the system. A red light that flashes in one second intervals indicates a fan failure. A red light which flashes in four second intervals indicates a power failure. When notified of an alert, check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers and air shrouds are installed. Finally, verify that the heatsinks are installed properly. This LED will remain flashing or on as long as the temperature is too high or a fan does not function properly.

NIC

Indicates network activity on any of the LAN ports when flashing

3-4 Drive Carrier LEDs

Each drive carrier has two LEDs.

- Blue: When illuminated, this blue LED (on the front of the drive carrier) indicates drive activity. A connection to the backplane enables this LED to blink on and off when that particular drive is being accessed.

- Red: The red LED indicates a drive failure. If one of the drives fail, you should be notified by your system management software.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 2016Ti-HTRF from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and floppy drive. When disconnecting power, you should first power down the system with the operating system. The unit may have more than one power supply cord. Disconnect both power supply cords before servicing to avoid electrical shock.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they might come into contact with.

- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- This product may be connected to an IT power system. In all cases, make sure that the unit is also reliably connected to Earth (ground).

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032). Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM Laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the server clean and free of clutter.

- The 2016Ti-HTRF weighs approximately 85 lbs (38.6 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up after ensuring that all connections have been made.

4-3 ESD Precautions

Electrostatic Discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.

- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

- Touch a grounded metal object before removing the board from the antistatic bag.

- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

- When handling chips or modules, avoid touching their pins.

- Put the serverboard and peripherals back into their antistatic bags when not in use.

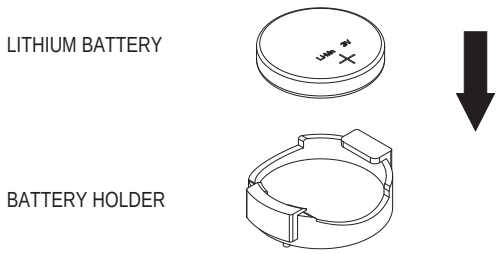
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 2016Ti-HTRF is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Figure 4-1. Installing the Onboard Battery



Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Chapter 5

Advanced Motherboard Setup

This chapter covers the steps required to install the X8SiT-HF motherboard into the chassis, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the motherboard to better cool and protect the system.

5-1 Handling the Motherboard

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the motherboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

- Use a grounded wrist strap designed to prevent Electrostatic Discharge (ESD).
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

5-2 Motherboard Installation

This section explains the first step of physically mounting the X8SiT-HF into the SC217HQ-R920B chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the motherboard, follow the procedure in reverse order.

Installing to the Chassis

1. Access the inside of the system by removing the screws from the top cover of the chassis, then lift the cover off.

2. Make sure that the I/O ports on the motherboard align properly with their respective holes in the I/O shield at the back of the chassis.

3. Carefully mount the motherboard to the motherboard tray by aligning the board holes with the raised metal standoffs that are visible in the chassis.

4. Insert screws into all the mounting holes on your motherboard that line up with the standoffs and tighten until snug (if you screw them in too tight, you might strip the threads). Metal screws provide an electrical contact to the motherboard ground to provide a continuous ground for the system.

5. Finish by replacing the top cover of the chassis.

Warning: To avoid damaging the motherboard and its components, do not apply any force greater than 8 lbs. per square inch when installing a screw into a mounting hole.

5-3 Connecting Cables

Now that the motherboard is installed, the next step is to connect the cables to the board. These include the data cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the motherboard layout for connector locations.)

- Control Panel cable (JF1)
- COM Port cable (COM2)
- SATA Port Cables (SATA0 ~ SATA3)

Connecting Power Cables

The X8SiT-HF has two 20-pin main proprietary power supply connectors (JWR3 and JWR4) for connection to the ATX power supply. Only one of these from each board should be connected to the power supply.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators.

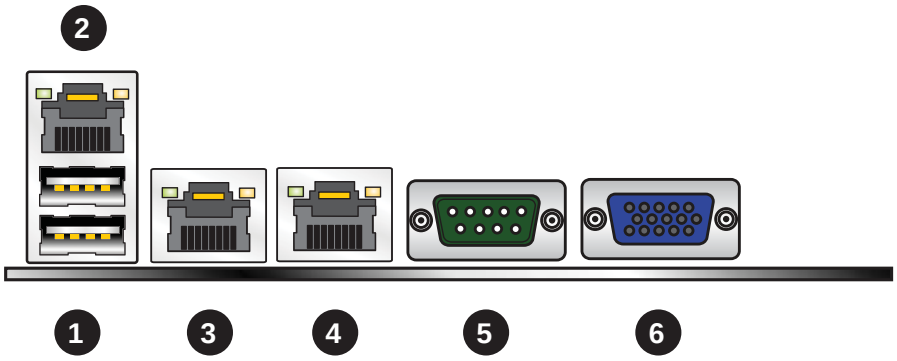
All JF1 wires have been bundled into a single cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Chapter 5 for details and pin descriptions.

Figure 5-1. Control Panel Header Pins

5-4 Rear I/O Ports

The rear I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. Rear I/O Ports



Rear I/O Ports	
1. USB0/1 Ports	4. LAN2 Port
2. IPMI Lan Port	5. COM1 Port
3. LAN1 Port	6. VGA Port

5-5 Processor and Heatsink Installation

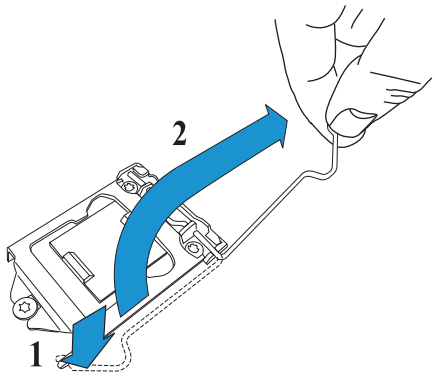
When handling the processor package, avoid placing direct pressure on the label area of the fan.

Notes:

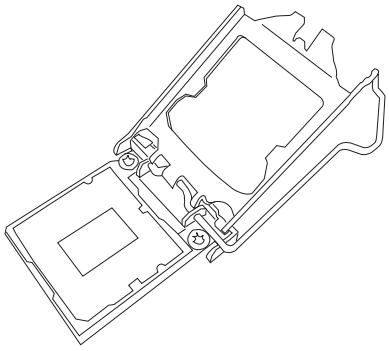
- Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.
- Make sure to install the serverboard into the chassis before you install the CPU heatsinks.
- When receiving a serverboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the Supermicro web site for updates on CPU support.

Installing the LGA1156 Processor

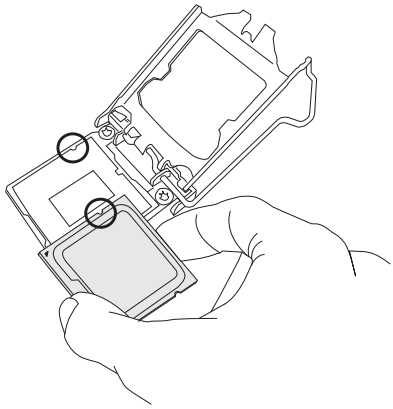
1. Press the load lever to release the load plate, which covers the CPU socket, from its locked position.



2. Gently lift the load lever to open the load plate. Remove the plate cap.



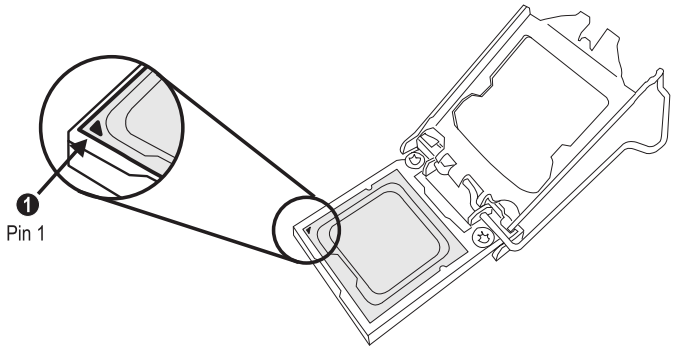
3. Use your thumb and your index finger to hold the CPU at the top center edge and the bottom center edge of the CPU.



4. Align the CPU key that is the semi-circle cutouts against the socket keys. Once aligned, carefully lower the CPU straight down to the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically.

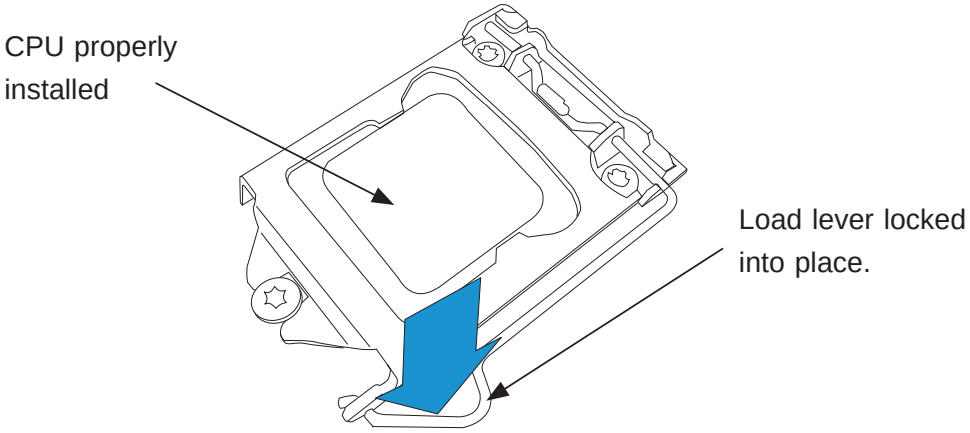
   Do not rub the CPU against the surface or against any pins of the socket to avoid damage to the CPU or the socket.)

   With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.



5. Use your thumb to gently push the load lever down to the lever lock.

   Save the plastic PnP cap. The motherboard must be shipped with the PnP cap properly installed to protect the CPU socket pins. Shipment without the PnP cap properly installed will cause damage to the socket pins.



Warning: The CPU will only seat inside the socket in one direction. Make sure it is properly inserted before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is aligned properly.

Installing a Passive CPU Heatsink

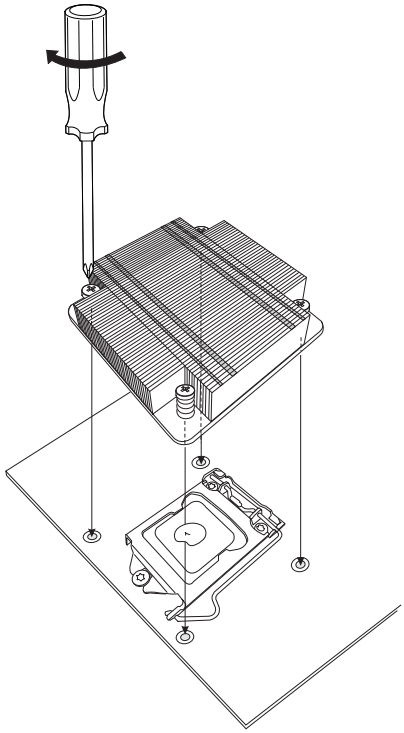
1. Do not apply any thermal grease to the heatsink or the CPU die -- the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the motherboard and the heatsink bracket underneath.

3. Screw in two diagonal screws (i.e., the #1 and the #2 screws) until just snug (do not over-tighten the screws to avoid possible damage to the CPU.)

4. Finish the installation by fully tightening all four screws.

Figure 5-3. Installing the Heatsink



Removing the Heatsink

Warning: We do not recommend removing the CPU or the heatsink. However, if you do need to remove the heatsink, please follow the instructions below to prevent damage to the CPU or other components.

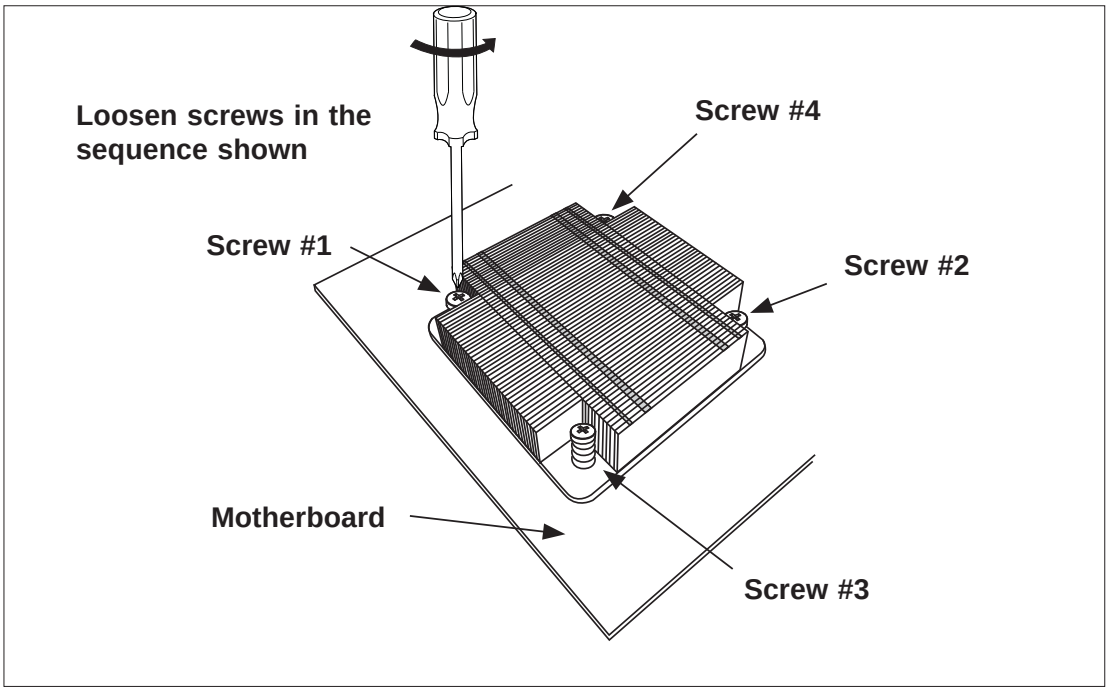
1. Unscrew the heatsink screws from the motherboard in the sequence as shown in the illustration below.

2. Gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!)

3. Once the CPU is loose, remove the it from the CPU socket.

4. Clean the surface of the CPU and the heatsink, removing the used thermal grease. Reapply the proper amount of thermal grease on the surface before re-installing the CPU and the heatsink.

Figure 5-4. Removing the Heatsink



5-6 Installing Memory

Note: Check the Supermicro web site for recommended memory modules.

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

DIMM Installation

1. Insert the desired number of DIMMs into the memory slots, starting with DIMM1A (slot 1, Channel A - see Figure A on the following page). Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent incorrect DIMM module installation.

2. Gently press down on the DIMM module until it snaps into place in the slot. Repeat step 1 to install DIMM1B if needed.

Memory Support

The X8SiT-HF supports up to 16GB of DDR3 ECC UDIMM or up to 32GB of ECC DDR3 RDIMM (1333/1066/800 MHz in 6 DIMM slots.) Populating the slots with a pair of memory modules of the same type and size will result in interleaved memory, which will improve memory performance. Please refer to the tables below:

Platform	DIMM Type	Intel® Xeon® Series Processors
X8SiT-HF	Non-ECC UDIMM Only	Not Supported
	ECC UDIMM Only	Supported (see Table 1)
	RDIMM Only (with ECC)	Supported (see Table 2)
	Mixed ECC with non-ECC	Not Supported
	Mixed UDIMM/RDIMM	Not Supported

DDR3 ECC/Unbuffered (UDIMM) Memory Support		
ECC UDIMM	**1Gb (x8 DRAM)**	**2Gb (x8 DRAM)**
Single Rank	Up to 4GB (4 x 1GB DIMM Modules)	Up to 8GB (4 x 2GB DIMM Modules)
Dual Rank	Up to 8GB (4 x 2GB DIMM Modules)	Up to 16GB (4 x 4GB DIMM Modules)
Quad Rank	Not Supported	Not Supported

Note: For ECC UDIMMs, only Slot 1 and Slot 2 may be populated per channel.

DDR3 ECC Registered (RDIMM) Memory Support		
RDIMM	**1Gb (x8 DRAM)**	**2Gb (x8 DRAM)**
Single Rank	Up to 6GB (6 x 1GB DIMM Modules)	Up to 12GB (6 x 2GB DIMM Modules)
Dual Rank	Up to 12GB (6 x 2GB DIMM Modules)	Up to 24GB (6 x 4GB DIMM Modules)
Quad Rank	Up to 16GB (4 x 4GB DIMM Modules)**	Up to 32GB (4 x 8GB DIMM Modules)**

Note: Memory sizes, types, die, density, that are not listed in these tables are NOT supported. For Quad Rank RDIMMs, only slot 1 and slot 2 are populated per channel.

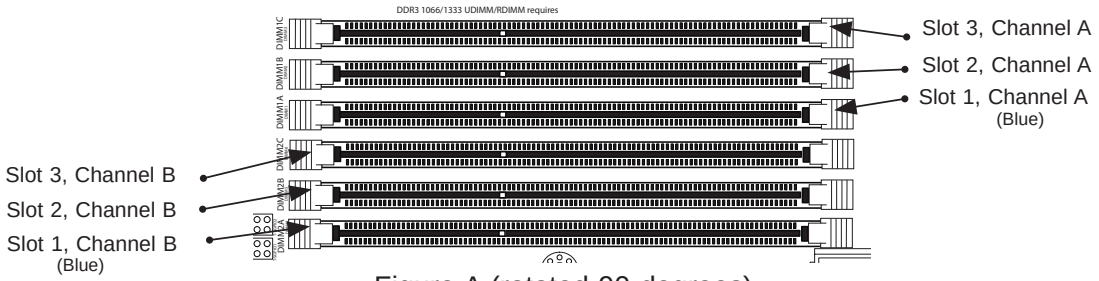


Figure A (rotated 90 degrees)

Memory Population Guidelines

Please follow the tables below when populating the X8SiT-HF.

DDR3 ECC UDIMM Memory				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type**	**POR Speeds**	**Ranks per DIMM (any combination)**
3	1	Unbuffered DDR3 ECC	1066, 1333	Single Rank, Dual Rank
3	2	Unbuffered DDR3 ECC	1066, 1333	Single Rank, Dual Rank
3	3	N/A	Not Supported	Single Rank, Dual Rank

DDR3 ECC RDIMM Memory				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type**	**POR Speeds**	**Ranks per DIMM (any combination)**
3	1	Registered DDR3 ECC	1066, 1333	Single Rank, Dual Rank
3	1	Registered DDR3 ECC	1066	Quad Rank
3	2	Registered DDR3 ECC	1066, 1333	Single Rank, Dual Rank
3	2	Registered DDR3 ECC	800*	Quad Rank
3	3	Registered DDR3 ECC	800*	Single Rank, Dual Rank
3	3	N/A	Not Supported	Quad Rank

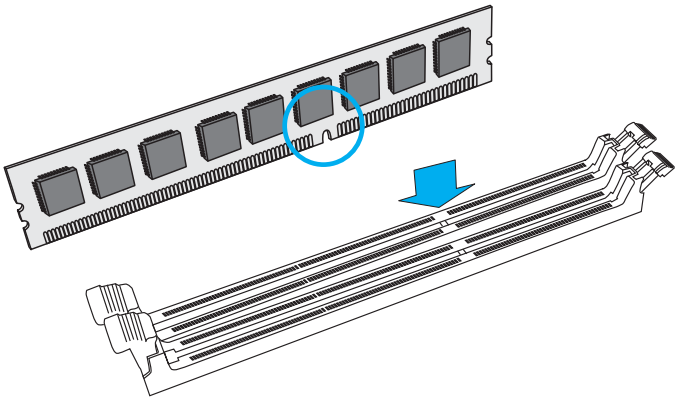
Notes:

For ECC UDIMMs , only Slot 1 and/or Slot 2 may be populated per channel.

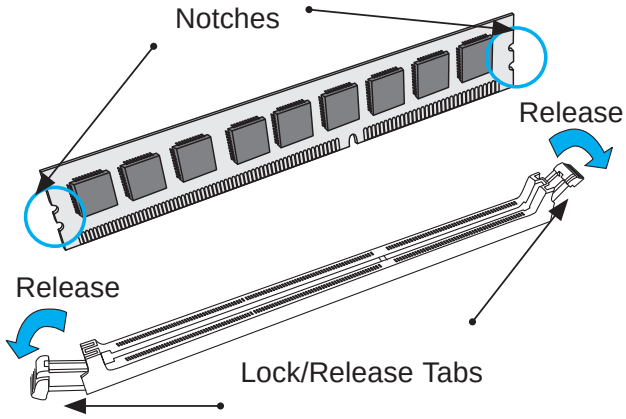
*BIOS will automatically reduce the clock speed to 800MHz for RDIMMs rated at 1066MHz and above.

Figure 5-3. DIMM Installation

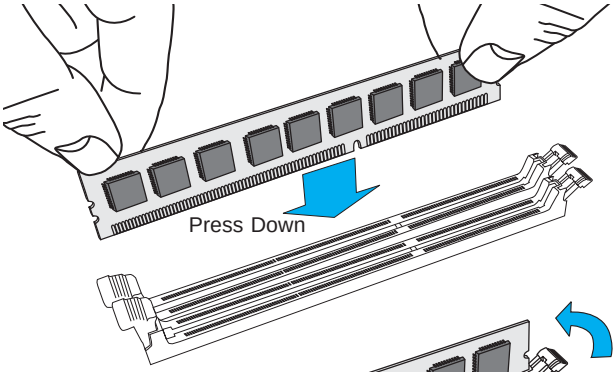
Position the DIMM module's bottom key so it aligns with the receptive point on the slot.



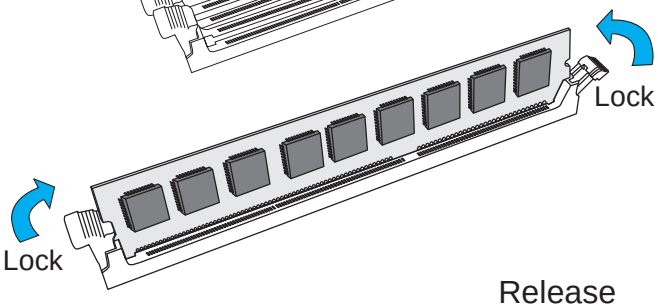
Push the Lock/Release tabs to their Release positions. Make sure that the DIMM module's side notches align with the slot's Lock/Release tabs as it is pressed in.



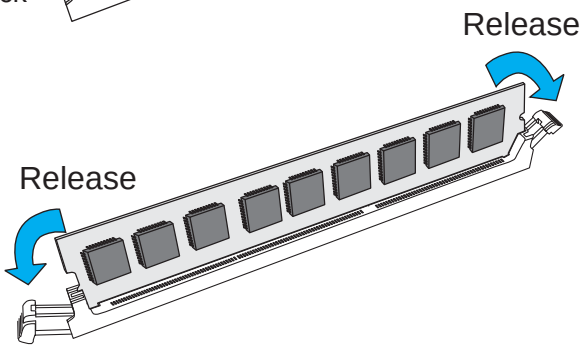
Insert the DIMM module vertically and press down until the module snaps into place.



When the module is properlly inserted, the Lock/Release tabs will automatically secure the DIMM module, locking it into place.



To Remove:
Use your thumbs to gently push the Lock/Release tabs near both ends of the module. This should release it from the slot. Pull the DIMM module upwards.



Note: Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional.

For Microsoft Windows users: Microsoft implemented a design change in Windows XP with Service Pack 2 (SP2) and Windows Vista. This change is specific to the Physical Address Extension (PAE) mode behavior which improves driver compatibility. For more information, please read the following article at Microsoft's Knowledge Base website at: http://support.microsoft.com/kb/888137.

Possible System Memory Allocation & Availability

System Device	Size	Physical Memory Remaining (-Available) (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99
Local APIC	4 KB	3.99
Area Reserved for the chipset	2 MB	3.99
I/O APIC (4 Kbytes)	4 KB	3.99
PCI Enumeration Area 1	256 MB	3.76
PCI Express (256 MB)	256 MB	3.51
PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary-	512 MB	3.01
VGA Memory	16 MB	2.85
TSEG	1 MB	2.84
Memory available to OS and other applications		2.84

5-7 Adding PCI Expansion Cards

The 2016Ti-HTRF includes four preinstalled riser cards designed specifically for use in the SC827 rackmount chassis. These riser cards support low-profile PCI Express x16 cards to fit inside the chassis.

Installing an Expansion Card

1. After powering down the system, remove the PCI slot shield.

2. Fully seat the card into the slot, pushing down with your thumbs evenly on both sides of the card.

3. Finish by using a screw to secure the top of the card shield to the chassis. The PCI slot shield protects the motherboard and its components from EMI and aid in proper ventilation, so make sure it is always in place.

5-8 Motherboard Details

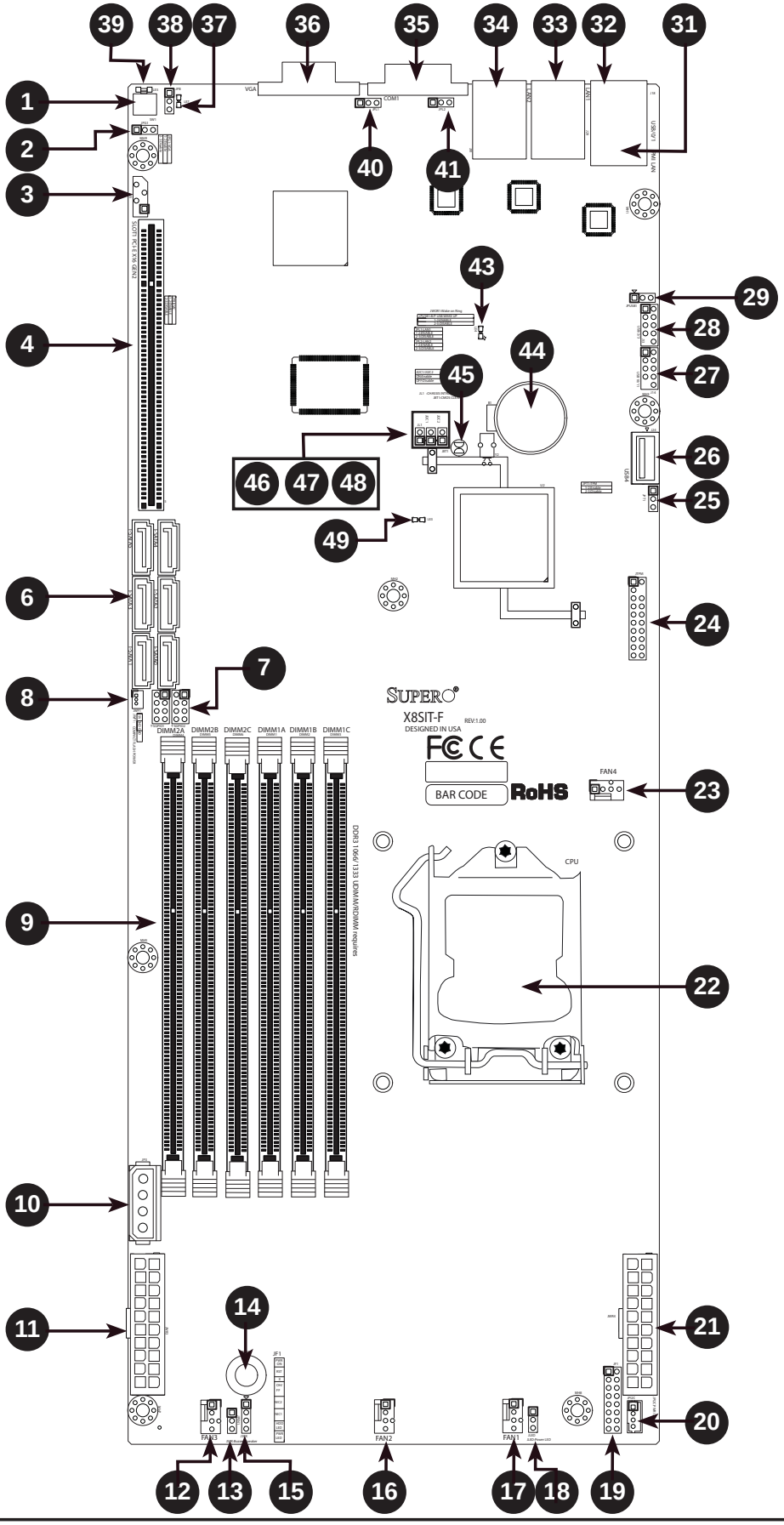
See the following page for a layout of the X8SiT-HF motherboard.

X8SiT-HF Quick Reference

Jumpers			
Number	**Jumper**	**Description**	**Default Setting**
2	JPG	Onboard VGA Enable	Pins 1-2 (Enabled)
13	JPEN1	Hot Swap Enable/Disable	Pins 1-2 (Enabled)
25	JPT1	TPM Enable	Pins 1-2 (Enabled)
29	JPUSB1	USB Wake-up	Pins 1-2 (Enabled)
38	JPB	BMC Jumper	Pins 1-2 (Enabled)
40,41	JPL1/JPL2	LAN1//LAN2 Enable	Pins 1-2 (Enabled)
45	JBT1	CMOS Clear	See Section 5-10
47,48	JI^{2}C1/JI^{2}C2	SMB to PCI Slots	See Section 5-10

Note: Jumpers not indicated are for test purposes only.

Figure 5-4. X8SiT-HF Layout



Connectors/Headers		
Number	**Connector**	**Description**
1	SW1	Unit ID Switch
3	J5	SMB Header for IPMI 2.0
4	Slot 1	PCI-E x16 2.0 Slot (Slot 1)
6	SATA0~5	SATA Ports 0 through 5
7	T-SGPIO-0/1	Serial General Purpose I/O Headers (for SATA)
8	JWF1	Compact Flash/DOM Power Connector
9	DIMMs 1~6	Memory Slots (DDR3 1066/1333 UDIMM/RDIMM)
10	JP3	4-Pin Auxilliary Power for Peripheral Devices
11,21	JWR3,JWR4	20-pin Main Proprietary Power Connectors
12,16,17,23	FAN3,2,1,4	System Fan Power Connectors
14	SPKR1	Internal Speaker/Buzzer
15	JD1	External Speaker Header
18	JLED	Power LED Indicator Header
19	JF1	Control Panel Header
20	JPI2C	PWR Supply (I^2C) System Management Bus
22	CPU	LGA 1156 CPU Socket
24	JTPM	TPM Header
26	USB4	Type A Internal USB Port
27	USB10/11	USB10/11 Front Panel USB Headers
28	USB2/3	USB2/3 Front Panel USB Headers
31	IPMI LAN	Back Panel IPMI 2.0 LAN Port
32	USB0/1	Back Panel USB Ports (USB0/1)
33,34	LAN1/LAN2	Back Panel LAN Ports (RJ45)
35	COM1	Back Panel COM1 Port
36	VGA	Back Panel VGA Port
44	B1	Onboard Battery
46	JL1	Chassis Intrusion Header

LED Indicators				
Number	**LED**	**Description**	**Color/State**	**Status**
37	LE7	IPMI Heartbeat LED	Yellow: Blinking	IPMI: Normal
39	LE5	Unit ID LED	Blue: Solid On	UID On
43	LE4	Standby Power LED	Green: Solid On	Power On
49	LE3	Memory Status	Yellow: Blinking	Error

5-9 Connector Definitions

20-pin Proprietary Power Connectors

There are two 20-pin main power supply connectors (JWR3, JWR4) and a 4-pin auxiliary power connector (JP3) on the motherboard. For the power supply to work properly, please follow the instructions given below. See the table on the right for pin definitions.

Note: You cannot use both JWR3 and JWR4 at the same time. Only one connector can be used for input power supply to the motherboard at a time. For proper use of the proprietary PWR connectors, please customize your PWR cables based on the SMC PWR connector pin-out definitions shown in the table.

20-pin Main Power Connector Pin Definitions

Pin#	Definition	Pin#	Definition
11	PS On	1	Ground
12	5VSB	2	Ground
13	Ground	3	Ground
14	Ground	4	Ground
15	Ground	5	Ground
16	NC2	6	NC1
17	12V	7	12V
18	12V	8	12V
19	12V	9	12V
20	12V	10	12V

Auxilliary Power Connector

The 4-pin processor power connector (JP3) is used to provide power to external devices such as hard disks & CD-ROM drives. This power connector supports 12V and 5V devices.

4-Pin External Power Connector Pin Definitions

Pin#	Definition
1	+12V
2	Ground 1
3	Ground 2
4	+5V

Optional Connection

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. To turn off the power when set to suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)

Pin#	Definition
1	Power Signal
2	Ground

Reset Button

The reset button (from the computer chassis) connects to pins 3 and 4 of JF1. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

PWR Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	Vcc
6	Ground

Overheat (OH)/Fan Fail/Front UID LED

Connect an LED cable to the Front UID and OH/Fan Fail connections on pins 7 and 8 of JF1 to display UID (Unit ID) signals or to provide advanced warnings for chassis overheat/fan failure. Refer to the table on the right for pin definitions.

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc/Blue UID LED
8	OH/Fan Fail LED

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

NIC1/NIC2 (LAN1/LAN2)

The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JF1, and the LED connection for LAN Port 2 is on Pins 9 and 10. These are 2-pin NIC LED headers. Attach LED cables to the respective pins to display network activities for LAN1 and LAN2. Refer to the table on the right for pin definitions.

NIC1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	Vcc
10/12	Ground

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a hard drive LED cable here to display HDD activity (for any hard drive activity on the system). See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	+3.3V
14	HD Active

Power LED

The Power LED connector is located on pins 15 and 16 of JF1. This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JF1)

Pin#	Definition
15	5V
16	Ground

Fan Headers

The X8SiT-HF has four fan headers. Fan1 is the CPU fan and Fan2 is for the system cooling fan. These fans are 4-pin fan headers, however pins 1~3 are backward compatible with the traditional 3-pin fans. A fan speed control setting in the BIOS Hardware Monitoring section allows the BIOS to automatically set fan speeds based on the system temperature. The default setting is Disabled, which allows the onboard fans to run at full speed. **Note**: Please use all 3-pin fans or all 4-pin fans on a motherboard. Please do not use 3-pin fans and 4-pin fans on the same board.

Fan Header Pin Definitions

Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWM Control

Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard. Attach the appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

Chassis Intrusion Pin Definitions (JL1)

Pin#	Definition
1	Intrusion Input
2	Ground

SMB

A System Management Bus (SMB) header for IPMI 2.0 is located at J5. Connect the appropriate cable here to use the IPMB I^2C connection on your system.

SMB Header Pin Definition

Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

Unit ID Switch

There are three Unit Identification (UID) devices on the motherboard. A rear UID switch and a rear UID LED indicator. The front panel UID LED is connected to a pin in the control panel (pin 7 of JF1). When the user pushes the rear UID switch, the control panel UID LED and the back panel UID LED (LE5) will turn on. Push the rear UID switch again to turn off both indicators. These UID indicators provide easy identification of a system unit that may be in need of service.

UID Switch

Pin#	Definition
1	Ground
2	Ground
3	Button In
4	Ground

Internal Speaker/Buzzer

The internal Speaker/Buzzer (SPKR1) can be used to provide audible indications for various beep codes. See the table on the right for pin definitions.

Internal Speaker/Buzzer Pin Definition

Pin#	Definitions	
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker

External Speaker

On the JD1 header, pins 3~4 are used to activate the internal speaker/buzzer. Close pins 3~4 with a jumper to use the internal speaker/buzzer. If you wish to use an external speaker, attach the external speaker's cable to pins 1~4. See the table on the right for pin definitions.

Speaker Connector Pin Definitions

Pin Setting	Definition
Pins 3~4	Internal Speaker
Pins1~4	External Speaker

Serial Ports

The COM1 serial ports is a located on the I/O back panel. See the table on the right for pin definitions.

Serial Port Pin Definitions

Pin#	Definition	Pin#	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

NC = No Connection

Power Supply I²C Connector

The power supply (I²C) connector is located at JPI²C on the motherboard. This connector can be used to monitor the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

PWR Supply I²C Pin Definitions

Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground

T-SGPIO 0/1 Headers

Two T-SGPIO (Serial-Link General Purpose Input/Output) headers are located near the SATA connectors on the motherboard. These headers are used to communicate with the enclosure management chip in the system. See the table on the right for pin definitions.

Serial_Link-SGPIO Pin Definitions

Pin#	Definition	Pin#	Definition
2	NC	1	NC
4	Data Out	3	Ground
6	Ground	5	Load
8	NC	7	Clock

NC = No Connection

Compact Flash/DOM PWR Connector

A Compact Flash/Disk On Module (DOM) power connector is located at JWF1. This connector is used to provide power to auxilliary flash memory media that is attached to a SATA port.

Compact Flash Card PWR Connector

Pin#	Definition
1	Vcc
2	GND
3	GND

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located beside the USB0/1 ports. The mouse port is above the keyboard port. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions

Pin#	Definition	Pin#	Definition
1	Data	4	VCC
2	NC	5	Clock
3	Ground	6	NC

NC = No Connection

Trusted Platform Module Header

This header is used to connect a Trusted Platform Module (TPM), available separately from a third-party vendor. A TPM is a security device that allows encryption and authentication of hard drives, disallowing access if the TPM associated with it is not installed in the system. See the table on the right for pin definitions.

Trusted Platform Module Header Pin Definitions

Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME	4	No Pin
5	LRESET	6	VCC5
7	LAD3	8	LAD2
9	VCC3	10	LAD1
11	LAD0	12	GND
13	RSV0	14	RSV1
15	SB3V	16	SERIRQ
17	GND	18	CLKRUN
19	LPCPD	20	RSV2

LAN1/2 (Ethernet Ports)

Two Ethernet ports (designated LAN1 and LAN2) are located beside the VGA port on the I/O backplane. These ports accept RJ45 type cables. A dedicated IPMI LAN port is also included on the rear I/O panel.

Universal Serial Bus (USB)

Two Universal Serial Bus ports (USB0/1) are located on the I/O backpanel. An additional four USB headers (USB 2/3 and USB 10/11) are included to provide front chassis access. USB 4 is a Type A USB port. USB cables are not included. See the tables on the right for pin definitions.

Back Panel USB Ports, Type A USB Port Pin Definitions

Pin#	Definition	Pin#	Definition
1	+5V	5	+5V
2	USB_PN	6	USB_PN
3	USB_PP	7	USB_PP
4	Ground	8	Ground

Front Panel USB Header Pin Definitions

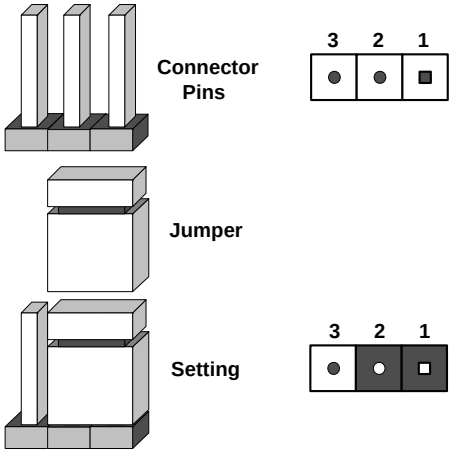
Pin#	Definition	Pin#	Definition
1	+5V	6	+5V
2	USB_PN	7	USB_PN
3	USB_PP	8	USB_PP
4	Ground	9	Ground
5	NA	10	Key

5-10 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS,

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS.*

LAN1/2 Enable/Disable

Change the setting of jumper JPL1 and JPL2 to enable or disable the LAN1 and LAN2 Ethernets ports, respectively. See the table on the right for jumper settings. The default setting is enabled.

LAN1/2 Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SMB Bus to PCI Slots

Use jumpers JI²C1 and JI²C2 to enable PCI Slot SMB (System Management Bus) support to improve system management for the PCI slots. See the table on the right for jumper settings. The default setting is disabled.

I²C to PCI-Slots Jumper Settings

Jumper	Definition
Closed	Enabled
Open	Disabled

USB Wake-Up

Use the JPUSB1 jumper to enable the "System Waking-Up via USB devices" function. This jumper allows you to "wake-up" the system by pressing a key on the USB keyboard or by clicking the USB mouse of your system. This jumper is used together with the USB Wake-Up function in the BIOS. Enable both the jumper and the BIOS setting to enable this function. See the table on the right for jumper settings.

Note: The default setting is disabled. When the "USB Wake-Up" function is enabled in the BIOS and JPUSB1 is also enabled, please be sure to remove all other USB devices from the USB ports whose USB jumpers are set to "Disabled" before the system goes into standby mode.

USB Wake-Up Jumper Settings

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

TPM Support Enable

JPT1 allows the user to enable TPM (Trusted Platform Modules) support to enhance data integrity and system security. See the table on the right for jumper settings. The default setting is Enabled.

TPM Support Jumper Settings

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

VGA Enable

JPG1 allows you to enable or disable the onboard VGA connector. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings	
Both Jumpers	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

Hot Swap Enable/Disable

When two X8SiT-HF motherboards are installed in a chassis, it is possible to power down one motherboard for servicing while the other continues operating. JPEN1 allows the user to enable motherboard 'hot-swapping', which enables this feature. The default setting is enabled.

Hot Swap Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

BMC Enable/Disable

The JPB jumper is used to enable or disable the onboard Baseboard Management Controller (BMC) and IPMI. This jumper is used together with the IPMI settings in the BIOS. The default position is enabled. See the table on the right for jumper settings.

BMC Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

5-11 Onboard Indicators

LAN1/2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each port, the yellow LED indicates activity while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the indication associated with the connection speed LED.

LAN1/2 LED (Connection Speed Indicator)	
LED Color	Definition
Off	No Connection or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

IPMI Dedicated LAN

In addition to LAN ports, a dedicated IPMI LAN is also installed on the X8SiT-HF. The yellow LED indicates activity, while the green LED indicates the speed of the connection. See the table at right for more information.

IPMI LAN Link LEDs		
LED	Color	Definition
Link (left)	Green: Solid	100 Mbps
Activity (right)	Yellow: Blinking	Active

Memory Status LED

A Memory Status LED is located at LE3. When LE3 blinks it indicates that a memory error has been detected.

Onboard Standby Power LED

An Onboard Standby Power LED is located at LE4 on the motherboard. When LE4 is on, the AC power cable is connected. Make sure to disconnect the power cable before removing or installing any component. See the layout below for the LED location.

Onboard Standby PWR LED LED Settings	
LED	Definition
Off	System Off
On	System on or system off and power cable connected

Rear UID LED

The rear UID LED is located at LE5 on the backplane. This LED is used in conjunction with the front UID LED and the rear UID switch to provide easy identification of a system that might be in need of service.

IPMI Heartbeat LED

An IPMI Heartbeat LED is located at LE7. When LE7 blinks the IPMI is functioning properly. Refer to the table on the right for details.

5-12 SATA Ports

SATA Ports

Six Serial ATA (SATA) ports (I-SATA 0~5) are located on the motherboard to provide serial link connections. Serial Link connections provide faster data transmission than those of the traditional Parallel ATA. See the table on the right for pin definitions.

SATA Port Pin Definitions

Pin#	Definition	Pin #	Definition
1	Ground	2	TXP
3	TXN	4	Ground
5	RXN	6	RXP
7	Ground		

5-13 Installing Software

After the hardware has been installed, you should first install the operating system and then the drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard.

Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

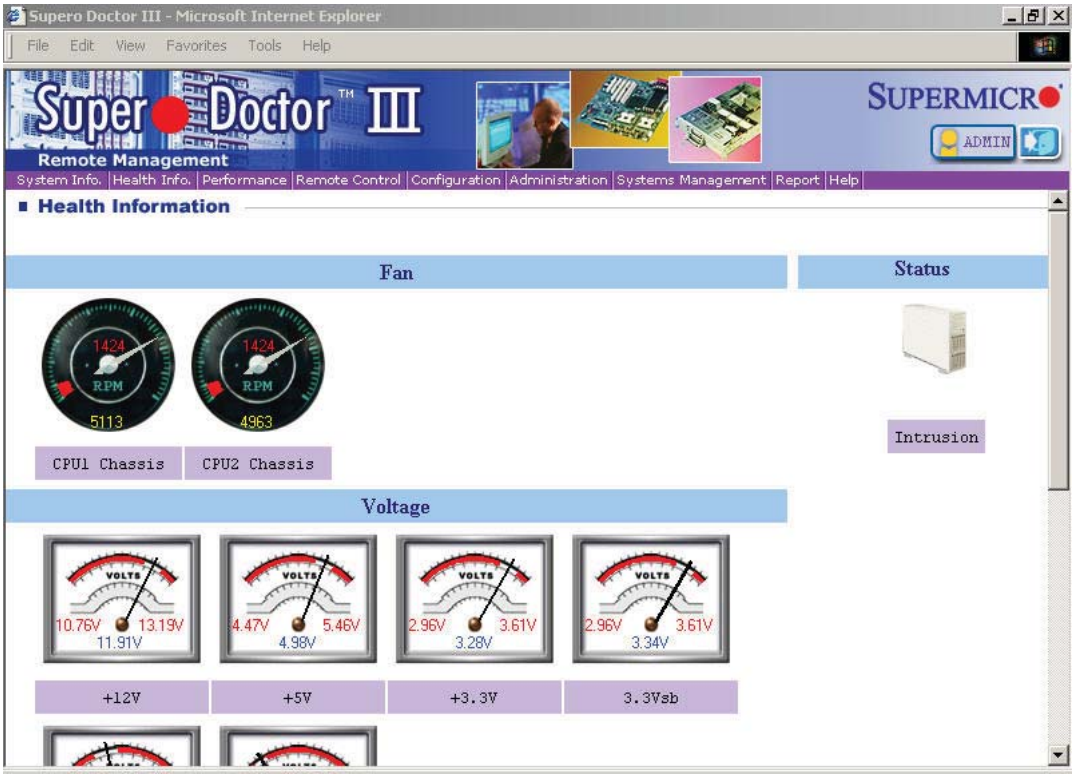
Supero Doctor III

The Supero Doctor III program is a web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Supero Doctor III program included on the CD-ROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Note: The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

Note: When SuperDoctor III is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within Super Doctor, as the Super Doctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor III.

Supero Doctor III Interface Display Screen (Health Information)



Supero Doctor III Interface Display Screen (Remote Control)

Note: SD III Software Revision 1.0 can be downloaded from our Web Site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download the SDIII User's Guide at: <http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf>. For Linux, we will recommend using Supero Doctor II.

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC217HQ-R920B chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows. The only tool you will need to install components and perform maintenance is a Philips screwdriver.

6-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

Figure 6-1. Chassis Front View

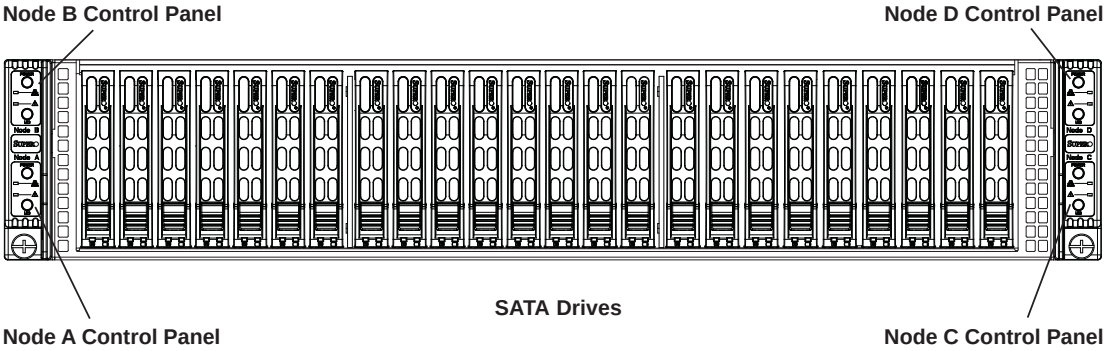
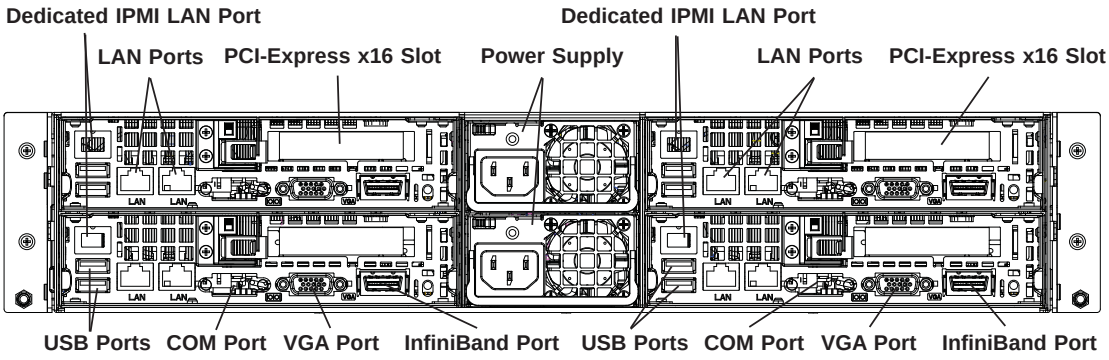


Figure 6-2. Chassis Rear View



6-2 Control Panel

Each control panel on the front of the chassis must be connected to the JF2 connector on its associated serverboard to provide you with system control buttons and status indicators.

These wires have been bundled together in a ribbon cable to simplify the connection. Connect the cable from JF2 on the serverboard to the control panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path. The LEDs inform you of system status for the serverboard it is connected to. See Chapter 3 for details on the LEDs and the control panel buttons.

6-3 System Fans

The system has four hot-swappable 8-cm PWM fans to provide the cooling for both nodes. The fans connect directly to the backplane but receive their power from the serverboard they are connected to logically. Fan speed may be controlled by a setting in BIOS (see Chapter 7).

Fan Configuration

In the 2U Twin, each node (serverboard) controls the two fans that reside on its side of the chassis. This means that two nodes will share control for two fans. If the fan speed settings in BIOS are different for these two nodes, the BIOS setting with the higher fan speed will apply. In the event that one of the serverboard drawers is removed, then the remaining node/serverboard will operate both fans.

Note: Due to this configuration, both nodes on the same side of the chassis as the failed fan must be powered down before replacing the fan.

System Fan Failure

If a fan fails, the remaining fans will ramp up to full speed and the overheat/fan fail LED on the control panel will blink on and off (about once per second). Replace any failed fan at your earliest convenience with the same type and model. See note above about powering down the nodes associated with the failed fan before replacing.

Changing a System Fan

1. If necessary, open the chassis while the power is running to determine which fan has failed. (Never run the server for an extended period of time with the chassis cover open.)

2. Remove the failed fan's wiring from the backplane.

3. Lift the fan up and out of the chassis.

4. Place the replacement fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.

5. Confirm that the fan is working properly before replacing the chassis cover.

6-4 Hard Drive Installation/Removal

Overview

The hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the system. For this reason, even empty carriers without drives installed must remain in the chassis.

Because of their hot-swap capability, you do not need to access the inside of the chassis or power down the system to install or replace hard drives.

Note: The operating system you use must have RAID support to enable the hot-swap capability of the hard drives.

Warning! Use caution when working around the hard drive backplane. Do not touch the backplane with any metal objects and make sure no cables touch the backplane. Also, regardless of how many drives are installed, all twelve drive carriers must remain in the chassis to maintain proper airflow.

Warning! Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro Web site at http://www.supermicro.com/products/nfo/storage.cfm

Installing and Removing Hard Drives

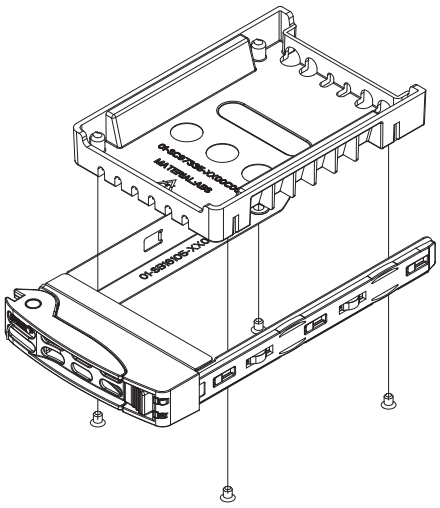
Mounting a Hard Drive in a Carrier

1. Install the drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.

2. Secure the drive to the carrier with four screws, as shown in Figure 6-3.

3. Use the open handle to replace the drive carrier into the chassis. Make sure to fully close the drive carrier handle.

Figure 6-3. Mounting a Hard Drive in a Carrier



Installing/Removing Hot-swap Drives

1. To remove a carrier, push the release button located beside the drive LEDs.

2. Swing the handle fully out and use it to pull the unit straight out (see Figure 6-4).

Be aware that powering down a node will power down all the hard drives that are logically associated with it (as shown in Figure 6-6).

Figure 6-4. Removing a Hard Drive

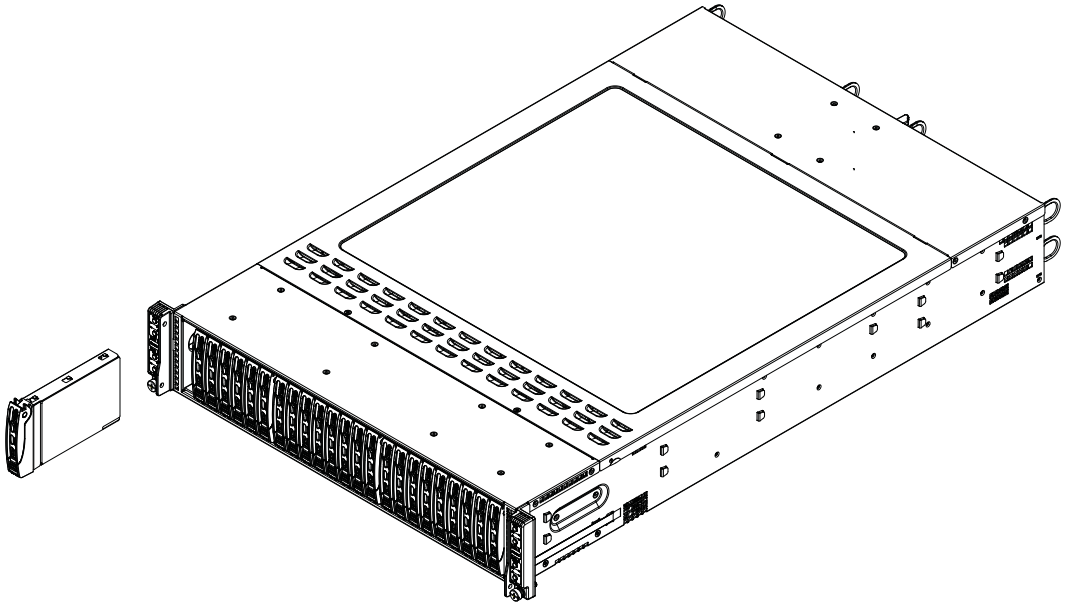
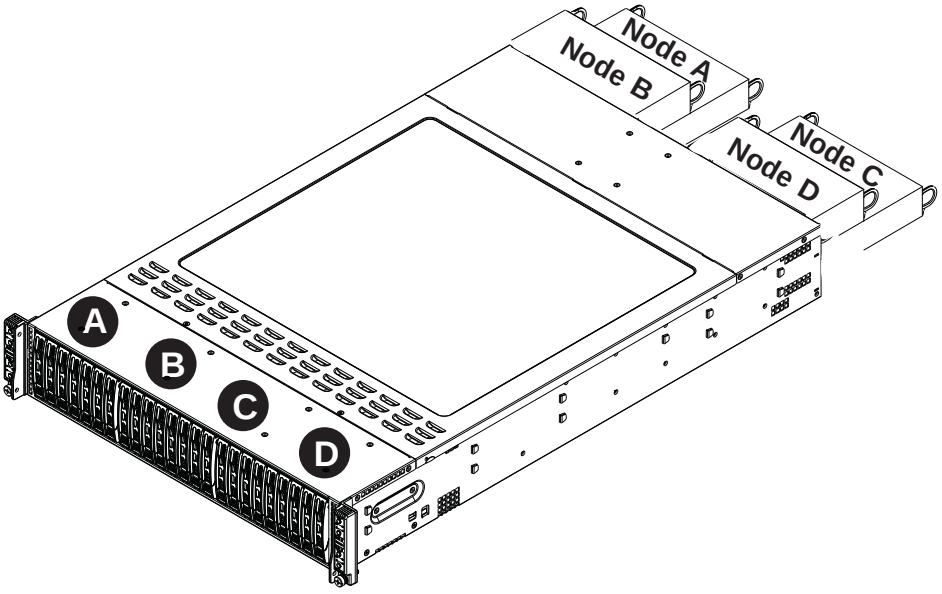


Figure 6-5. Drives and Nodes: Logical Configuration



Note: see Figure 6-1 for the locations of the control panels that are associated with each node.

6-5 Node Installation/Removal

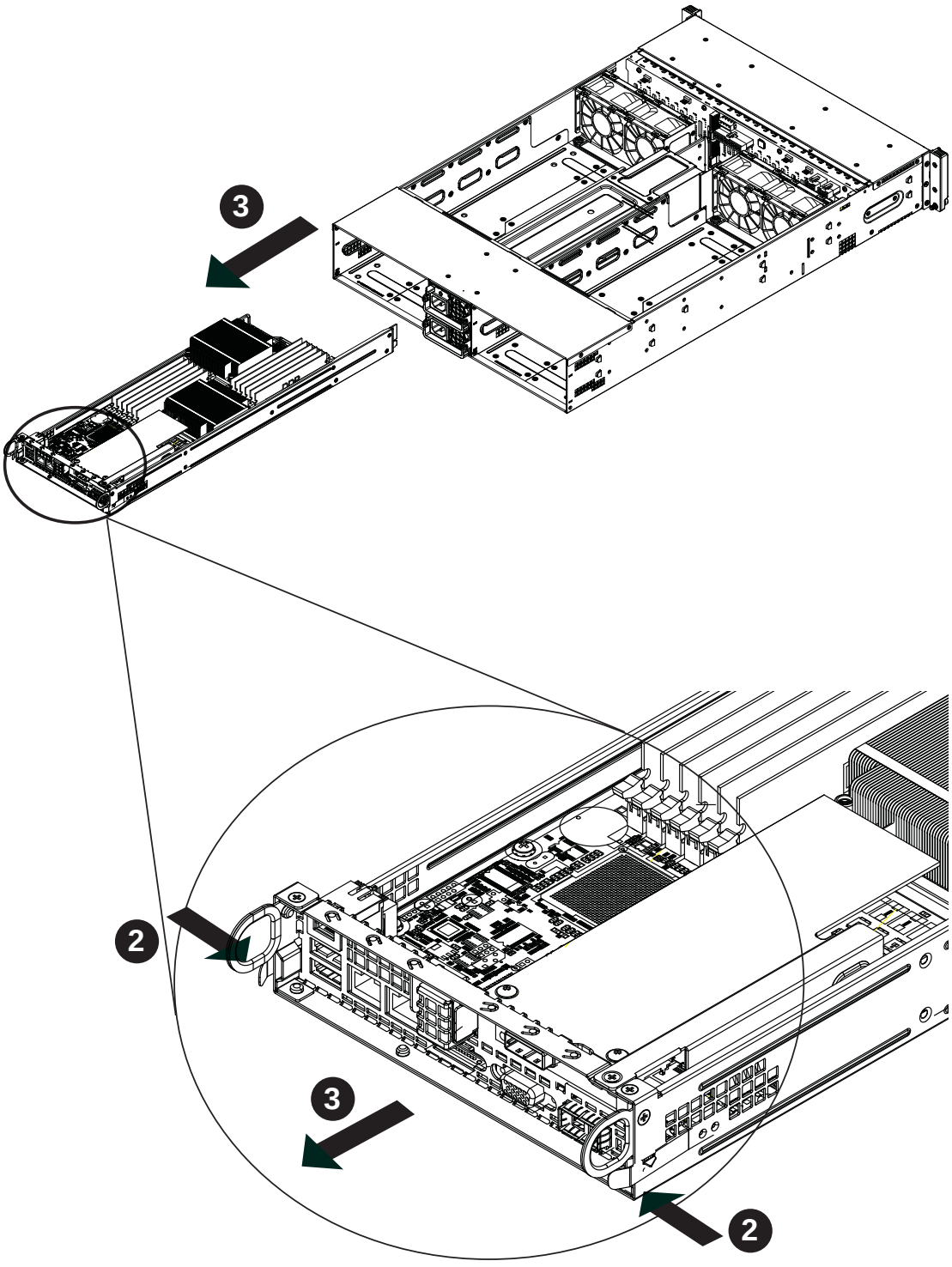
As with any server system, power must be removed from the serverboard when upgrading or installing memory or processors. In the 2U Twin server, the serverboards (nodes) are capable of being hot-swapped from the chassis, allowing one to be powered down for servicing while the other continues operating.

Important! Removing a node from the server affects the airflow throughout the system. For this reason, nodes should be removed, serviced and replaced as quickly as possible. Also note that powering down a node will power down all the hard drives that are logically associated with it.

Removing a System Node

1. Depress the power button on the control panel to power down the node.
2. There are two latches located below the handles at the rear of the node tray. Push both of these inward.
3. While pushing the latches inward, grasp both handles and pull the node from the chassis.
4. Perform any service needed to the node in a timely manner.
5. Reinstall the node by pushing it into its bay until firmly seated.

Figure 6-7. Removing a System Node



Note: numbers correspond to the procedural steps as described on the previous page.

6-6 Installing the Air Shrouds

Air Shrouds

Air shrouds concentrate airflow to maximize fan efficiency. The SC217 chassis air shroud does not require screws to set up. Four identical air shrouds are required, one in each serverboard drawer.

Installing an Air Shroud

1. Confirm that all four fans are in place and working properly

2. Place the first air shroud into the serverboard drawer so that it sits behind the system fans and goes over the top of the serverboard and its components.

3. Repeat the procedure for the remaining serverboard drawer.

6-7 Power Supply

The SuperServer 2016Ti-HTRF server has two 920 watt power supply modules to provide redundant power for the system. If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption. The LED on the control panel will flash slowly (about 4 seconds on and 4 off) and remain flashing until the failed unit has been replaced. Replacement units can be ordered directly from Supermicro (see contact information in the Preface). The power supply units have a hot-swap capability, meaning you can replace the failed unit without powering down the system.

Removing/Replacing the Power Supply (Figure 6-8)

1. Disconnect the AC power cord from the failed module.

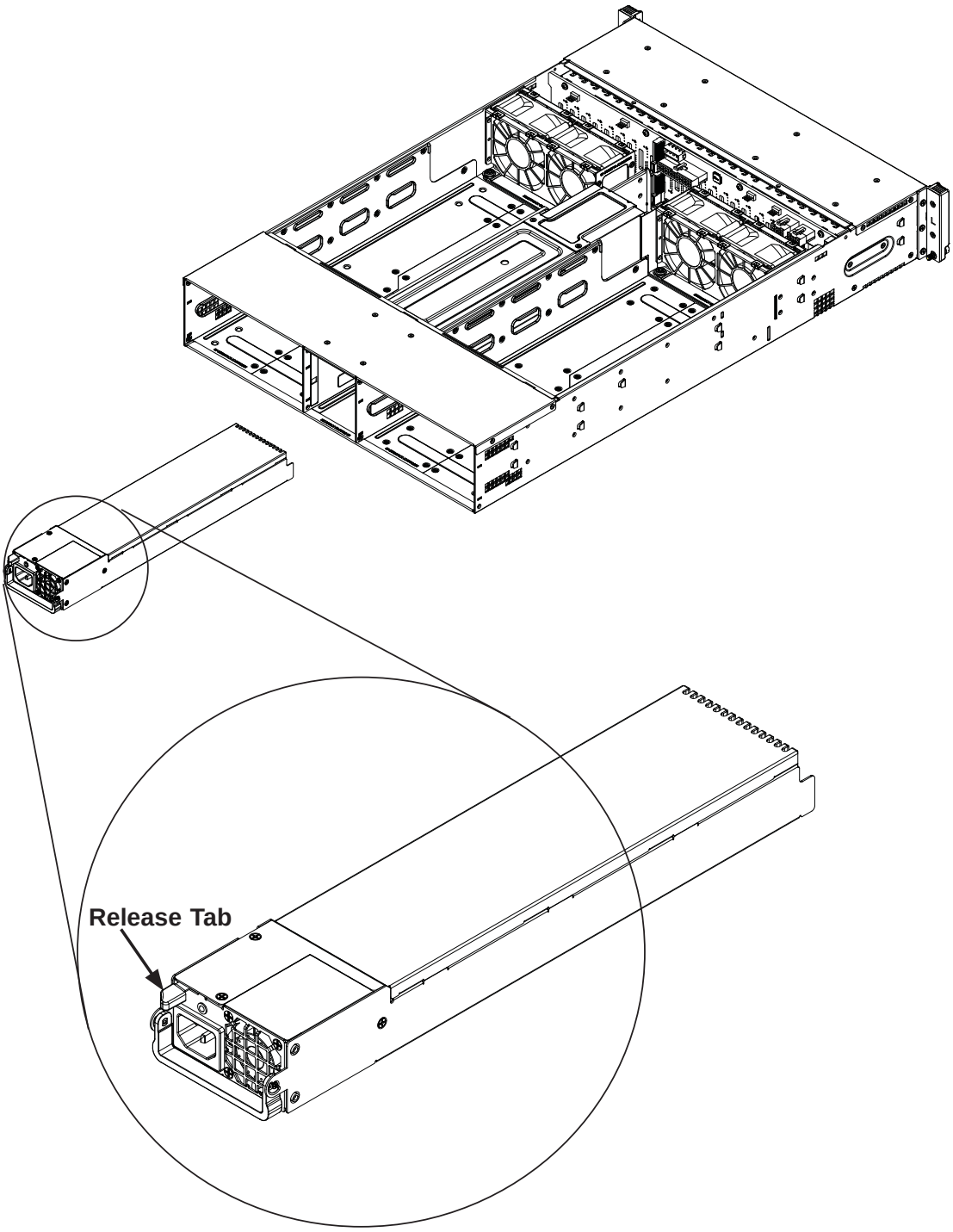
2. Push the colored release tab to the side and pull the power module out with the handle provided.

3. Replace the failed power supply module with the exact same model from Supermicro.

4. Carefully insert the new module into position in the chassis and push it in until fully seated. You should see the LED on the rear of the module turn amber showing that power (from the backup module) is present.

5. Reconnect the AC power cord to the new module.

Figure 6-8. Removing the Power Supply



Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X8SiT-HF. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Note: For instructions on BIOS recovery, please refer to the instruction guide posted at http://www.supermicro.com/support/manuals/.

Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.

Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (**Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

Note: Options printed in **Bold** are default settings.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

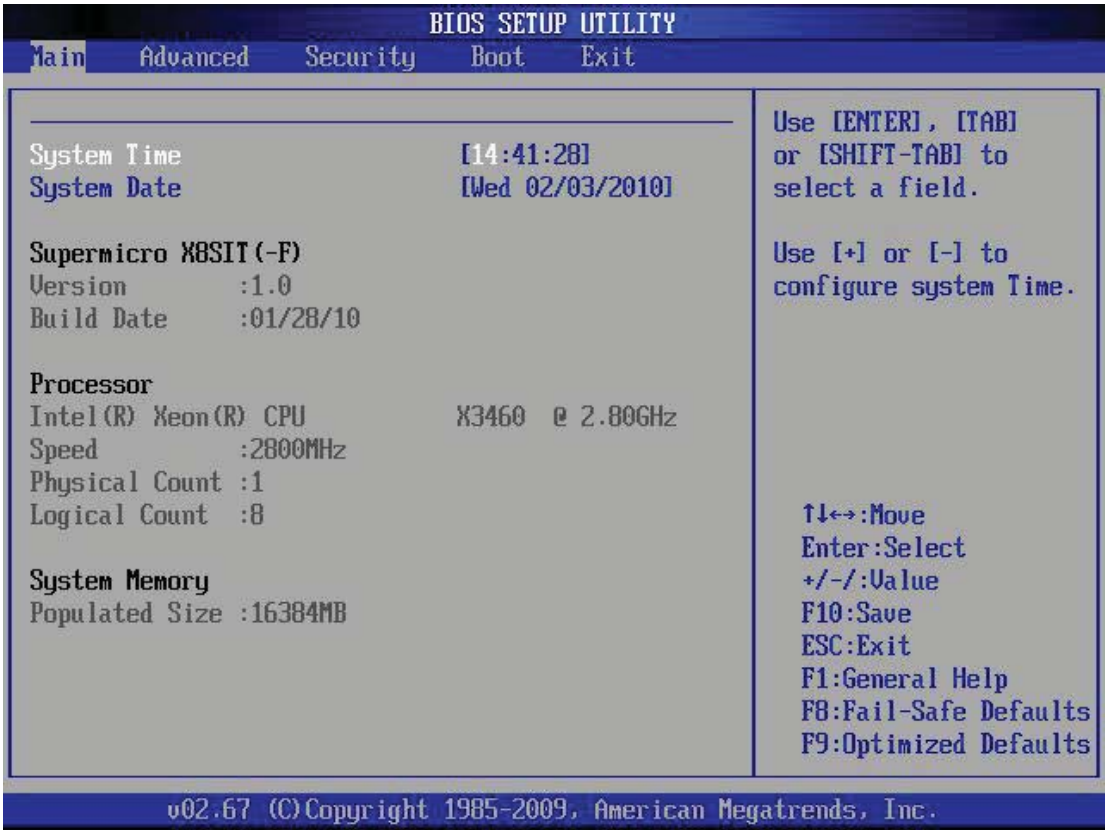
How to Start the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen, below the copyright message.

Warning! Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

7-2 Main Setup

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.



System Overview: The following BIOS information will be displayed:

System Time/System Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Enter new values through the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.)

Supermicro X8SiT-HF

Version

Build Date

Processor

The AMI BIOS will automatically display the status of processor as shown below:

Type of Processor

Speed

Physical Count

Logical Count

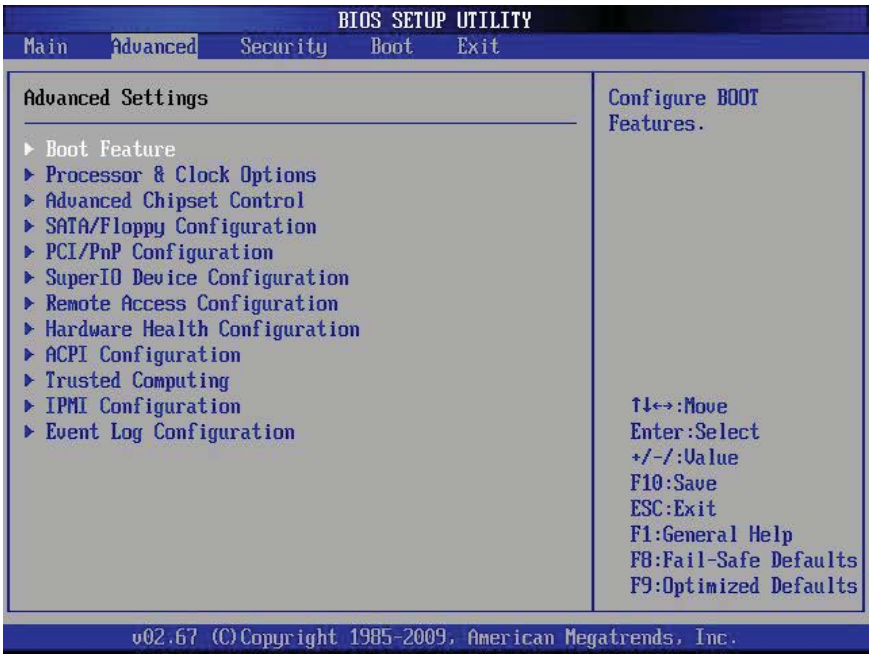
System Memory

This displays the size of memory available in the system:

Populated Size

7-3 Advanced Setup Configurations

Use the arrow keys to select Boot Setup and hit <Enter> to access the submenu items:



▶BOOT Feature

Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

Quiet Boot

This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

This sets the display mode for Option ROM. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

This feature selects the Power-on state for Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

This forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

Hit 'Del' Message Display

This feature displays "Press DEL to run Setup" during POST. The options are **Enabled** and Disabled.

Watch Dog Function

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

Power Button Mode

This setting allows you to decide if the power button will turn off the system instantly or wait for 4 seconds when it is pressed. The options are **Instant Off** and 4 Seconds Override.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, Power-Off and **Last State**.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at boot and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

SMC Chassis Type

This feature selects the type of Supermicro chassis used with the motherboard. Select 1U for the Twin system, which features a Power Fail LED and an Overheat (OH)/Fan Fail LED. Select 2U for the Twin2 system, which features a System Warning LED only. The options are **1U** and 2U.

▶Processor & Clock Options

Warning: Take Caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency or incorrect DRAM timing may cause system to become unstable. When this occurs, revert to the default setting.

CPU Ratio

This feature allows the user to use the CPU clock multiplier to multiply CPU speed in order to enhance performance. Select Manual to Manually set the multiplier setting. Select Auto for the BIOS to automatically select the CPU multiplier setting for your system. The options are **Auto** and Manual.

Clock Spread Spectrum

Select Enable to use the feature of Clock Spectrum, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. Select Disabled to enhance system stability. The options are **Disabled** and Enabled.

Hardware Prefetcher (Available when supported by the CPU)

If set to Enabled, the hardware pre fetcher will pre fetch streams of data and instructions from the main memory to the L2 cache in the forward or backward manner to improve CPU performance. The options are Disabled and **Enabled**.

Adjacent Cache Line Prefetch (Available when supported by the CPU)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

MPS and ACPI MADT Ordering

This feature allows the user to choose the method of ordering for the Multiple APIC Description Table (MADT). Select Modern Ordering if you have the Microsoft Windows XP or later version of the OS. Select Legacy Ordering if you use Microsoft Windows 2000 or earlier version of the OS. The options are **Modern Ordering** and Legacy Ordering.

Intel® Virtualization Technology (Available when supported by the CPU)

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled. **Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

Execute-Disable Bit Capability (Available when supported by the OS and the CPU)

Set to Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web Sites for more information.)

Simultaneous Multi-Threading (Available when supported by the CPU)

Set to Enabled to use the Hyper-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Active Processor Cores

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All,** 1, 2, 3 and 4.

Intel® EIST Technology

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. **Please refer to Intel's web site for detailed information.** The options are Disabled and **Enabled**.

Intel® Turbo Boost Technology (Available if Intel® EIST technology is Enabled)

This feature allows processor cores to run faster than marked frequency in specific conditions. The options are Disabled and **Enabled.**

C1E Support

Select Enabled to use the "Enhanced Halt State" feature. C1E significantly reduces the CPU's power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disabled and **Enabled**.

Intel® C-STATE Tech

If enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Default and **Enabled**.

C-State package limit setting

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are **Auto**, C1, C3, C6 and C7.

C1 Auto Demotion

When enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 based on un-core auto-demote information. The options are Disabled and **Enabled.**

C3 Auto Demotion

When enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are Disabled and **Enabled.**

▶Advanced Chipset Control

The items included in the Advanced Settings submenu are listed below.

Memory Remap Feature

This feature, when enabled, allows the remapping of everlapped PCI memory above the total physical memory. The settings are **Enabled** and Disabled.

Intel VT-d

Select Enabled to enable Intel's Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are Enabled and **Disabled**.

Active State Power Management

Select Enabled to start Active-State Power Management for signal transactions between L0 and L1 Links on the PCI Express Bus. This maximizes power-saving and transaction speed. The options are Enabled and **Disabled**.

USB Functions

This feature allows the user to decide the number of onboard USB ports to be enabled. The Options are: Disabled and **Enabled**.

Legacy USB Support (available if USB Functions above is Enabled)

Select Enabled to use Legacy USB devices. If this item is set to Auto, Legacy USB support will be automatically enabled if a legacy USB device is installed on the motherboard, and vise versa. The settings are Disabled, Enabled and **Auto**.

▶SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE Devices and displays the following items:

SATA#1 Configuration

If Compatible is selected, it sets SATA#1 to legacy compatibility mode, while selecting Enhanced sets SATA#1 to native SATA mode. The options are Disabled, Compatible, **Enhanced.**

Configure SATA as

This feature allows the user to select the drive type for SATA#1. The options are **IDE**, RAID and AHCI.

PCH RAID CodeBase (Available if RAID is selected above)

Select Intel to enable the Intel SATA Host RAID Utility. Select Adaptec to use the Adaptec Host RAID Utility. The options are **Intel** and Adaptec.

SATA#2 Configuration (Available when IDE is enabled under "Configure SATA#1 as" above)

Selecting Enhanced will set SATA#2 to native SATA mode. The options are Disabled and **Enhanced**

IDE Detect Timeout (sec)

Use this feature to set the time-out value for the BIOS to detect the ATA, ATAPI devices installed in the system. The options are 0 (sec), 5, 10, 15, 20, 25, 30, and **35**.

SATA 0 ~ 5

These settings allow the user to set the parameters of the disc storage devices attached to the SATA ports. Press <Enter> to activate the following submenu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the submenu are:

Type

Select the type of device connected to the system. The options are Not Installed, **Auto**, CD/DVD and ARMD.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In the LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must be equipped with a 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block Mode boosts the IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if Block Mode is not used. Block Mode allows transfers of up to 64 KB per interrupt. Select Disabled to allow data to be transferred from and to the device one sector at a time. Select Auto to allow data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

PIO Mode

The IDE PIO (Programmable I/O) Mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4.

Select Auto to allow the AMI BIOS to automatically detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.

Select 0 to allow the AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MBs.

Select 1 to allow the AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MBs.

Select 2 to allow the AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MBs.

Select 3 to allow the AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MBs.

Select 4 to allow the AMI BIOS to use PIO mode 4. It has a data transfer bandwidth of 32-Bits. Select Enabled to enable 32-Bit data transfer.

DMA Mode

Select Auto to allow the BIOS to automatically detect IDE DMA mode when the IDE disk drive support cannot be determined.

Select SWDMA0 to allow the BIOS to use Single Word DMA mode 0. It has a data transfer rate of 2.1 MBs.

Select SWDMA1 to allow the BIOS to use Single Word DMA mode 1. It has a data transfer rate of 4.2 MBs.

Select SWDMA2 to allow the BIOS to use Single Word DMA mode 2. It has a data transfer rate of 8.3 MBs.

Select MWDMA0 to allow the BIOS to use Multi Word DMA mode 0. It has a data transfer rate of 4.2 MBs.

Select MWDMA1 to allow the BIOS to use Multi Word DMA mode 1. It has a data transfer rate of 13.3 MBs.

Select MWDMA2 to allow the BIOS to use Multi-Word DMA mode 2. It has a data transfer rate of 16.6 MBs.

Select UDMA0 to allow the BIOS to use Ultra DMA mode 0. It has a data transfer rate of 16.6 MBs. It has the same transfer rate as PIO mode 4 and Multi Word DMA mode 2.

Select UDMA1 to allow the BIOS to use Ultra DMA mode 1. It has a data transfer rate of 25 MBs.

Select UDMA2 to allow the BIOS to use Ultra DMA mode 2. It has a data transfer rate of 33.3 MBs.

Select UDMA3 to allow the BIOS to use Ultra DMA mode 3. It has a data transfer rate of 66.6 MBs.

Select UDMA4 to allow the BIOS to use Ultra DMA mode 4 . It has a data transfer rate of 100 MBs.

The options are **Auto**, SWDMAn, MWDMAn, and UDMAn.

S.M.A.R.T.

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select Auto to allow the AMI BIOS to automatically detect hard disk drive support. Select Disabled to prevent the AMI BIOS from using the S.M.A.R.T. Select Enabled to allow the AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

32-Bit Data Transfer

Select Enable to enable the function of 32-bit IDE data transfer. The options are **Enabled** and Disabled.

▶PCI/PnP Configuration

This feature allows the user to set the PCI/PnP configurations for the following items:

Clear NVRAM

This feature clears the NVRAM during system boot. The options are **No** and Yes.

Plug & Play OS

Selecting Yes allows the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select **No** to allow the AMI BIOS to configure all devices in the system.

PCI Latency Timer

This feature sets the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

PCI IDE Bus Master

When enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are **Disabled** and Default.

PCIE I/O Performace

This feature selects the setting for the processor's PCIE maximum payload size. The options are 128B and **256B.**

ROM Scan Ordering

This item determines what kind of option ROM activates over another. The options are **Onboard First** and Add-on First.

PCI Slot 1 OPROM

Use this feature to enable or disable PCI slot Option ROMs. The options are Disabled and **Enabled.**

Onboard LAN1 Option ROM Select

This feature selects whether to load the iSCSI or PXE onboard LAN option ROM. The options are iSCSI and **PXE**.

Load Onboard LAN1 Option ROM
Load Onboard LAN2 Option ROM

This feature is to enable or disable the onboard LAN option ROMs. The options are **Disabled** and Enabled.

Boot Graphics Adapter Priority

Use this feature to select the graphics controller to be used as the primary boot device. The options are Other and **Onboard VGA**.

▶Super IO Device Configuration

Serial Port1 Address/ Serial Port3 Address

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 3. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable. Select 3F8/IRQ4 to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options for Serial Port 1 are Disabled, **3F8/IRQ4**, 2E8/IRQ3. The options for Serial Port 3 are Disabled, **2F8/IRQ3**, and 2E8/IRQ3.

▶Remote Access Configuration

Remote Access

This allows the user to enable the Remote Access feature. The options are **Disabled** and Enabled.

If Remote Access is set to Enabled, the following items will display:

Serial Port Number

This feature allows the user to decide which serial port to be used for Console Redirection. The options are COM 1 and **COM 3**.

Note: Serial Over LAN (SOL) will be enabled when either COM 1 or COM 3 is selected.

Serial Port Mode

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

Flow Control

This feature allows the user to set the flow control for Console Redirection. The options are **None**, Hardware, and Software.

Redirection After BIOS POST

Select Disabled to turn off Console Redirection after Power-On Self-Test (POST). Select Always to keep Console Redirection active all the time after POST. (Note: This setting may not be supported by some operating systems.) Select Boot Loader to keep Console Redirection active during POST and Boot Loader. The options are Disabled, Boot Loader, and **Always**.

Terminal Type

This feature allows the user to select the target terminal type for Console Redirection. The options are **ANSI**, VT100, and VT-UTF8.

VT-UTF8 Combo Key Support

This is a terminal keyboard definition that provides a way to send commands from a remote console. Available options are **Enabled** and Disabled.

Sredir Memory Display Delay

This feature defines the length of time in seconds to display memory information. The options are **No Delay,** Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

▶Hardware Health Configuration

This feature allows the user to monitor Hardware Health of the system and review the status of each item when displayed.

CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.

Warning: Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed.

The options are:

- The Early Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

- **The Default Alarm**: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5ºC above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

System Temperature

This feature displays the absolute system temperature (i.e., 34ºC).

CPU Temperature

The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

Low – This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

User intervention: No action required.

Medium – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

High – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm:

The Default Alarm – the Overheat LED and system buzzer will activate if the High condition continues for some time after it is reached. The CPU fan will run at full speed to bring the CPU temperature down. If the CPU temperature still increases

even with the CPU fan running at full speed, the system buzzer will activate and the Overheat LED will turn on.

The Early Alarm – the Overheat LED and system buzzer will be activated exactly when the High level is reached. The CPU fan will run at full speed to bring the CPU temperature down.

Note: In both the alarms above, please take immediate action as shown below. See CPU Overheat Alarm to modify the above alarm settings.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems. Note: the system may shut down if it continues for a long period to prevent damage to the CPU.

Notes: The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is that each CPU is embedded by a unique temperature information that the motherboard can read. This 'Temperature Threshold' or 'Temperature Tolerance' has been assigned at the factory and is the baseline by which the motherboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different 'Temperature Tolerances', the installed CPU can now send its 'Temperature Tolerance' to the motherboard resulting in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading (i.e., 25^{o}C).

The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at www.Intel.com.

Fan1 ~ Fan 4 Reading

This feature displays the fan speed readings from fan interfaces Fan1 through Fan4.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select Full Speed to allow the onboard fans to run at full speed (of 100% Pulse Width Modulation Duty Cycle) for maximum cooling. The Full Speed setting is recommended for special system configuration or debugging. Select Performance for the onboard fans to run at 70% of the Initial PWM Cycle for

better system cooling. The Performance setting is recommended for high-power-consuming and high-density systems. Select Balanced for the onboard fans to run at 50% of the Initial PWM Cycle in order to balance the needs between system cooling and power saving. The Balanced setting is recommended for regular systems with normal hardware configurations. Select Energy Saving for the onboard fans to run at 30% of the Initial PWM Cycle for best power efficiency and maximum quietness. The Options are: **Full Speed (@100% of PWM Cycle)**, Performance (@70% of PWM Cycle), Balanced (@50% of PWM Cycle), and Energy Saving (@30% of PWM Cycle).

CPU Vcore, AVCC, 3.3Vcc, 12V, V_DIMM, 5V, 5Vsb, 3.3Vsb, and Vbat

▶ACPI Configuration

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

High Performance Event Timer

Select Enabled to activate the High Performance Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

ACPI Aware O/S

Enable ACPI support if it is supported by the OS to control ACPI through the Operating System. Otherwise, disable this feature. The options are **Yes** and No.

ACPI APIC Support

Select Enabled to include the ACPI APIC Table Pointer in the RSDT (Root System Description Table) pointer list. The options are **Enabled** and Disabled.

APIC ACPI SCI IRQ

When this item is set to Enabled, APIC ACPI SCI IRQ is supported by the system. The options are Enabled and **Disabled**.

Headless Mode

This feature is used to enable the system to function without a keyboard, monitor or mouse attached The options are Enabled and **Disabled**.

ACPI Version Features

The options are ACPI v1.0, **ACPI v2.0** and ACPI v3.0. Please refer to ACPI's website for further explanation: http://www.acpi.info/

▶IPMI Configuration

Intelligent Platform Management Interface (IPMI) is a set of common interfaces that IT administrators can use to monitor system health and to manage the system as a whole. For more information on the IPMI specifications, please visit Intel's website at www.intel.com.

IPMI Firmware Revision

This item displays the current IPMI firmware revision.

Status of BMC

Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This is an informational feature which returns the status code of the BMC micro controller.

View BMC System Event Log

This feature is used to view any BMC events. It shows the total number of entries and will allow the viewing of each event by scrolling down on an Entry Number and pressing Enter.

Clear BMC System Event Log

This feature is used to clear the System Event Log. Caution: Any cleared information is unrecoverable. Make absolutely sure you no longer need any data stored in the log before clearing the BMC Event Log.

Set LAN Configuration

Set this feature to configure the IPMI LAN adapter with a network address.

Channel Number - Enter the channel number for the SET LAN Config command. This is initially set to **[1]**. Press <+> or <-> on your keyboard to change the Channel Number.

Channel Number Status - This feature returns the channel status for the Channel Number selected above: "Channel Number is OK" or "Wrong Channel Number".

IP Address Source - This feature selects whether the IP address, Subnet Mask and Gateway Address are automatically assigned by the network's DHCP server (Dynamic Host and Configuration Protocol) or manually entered by the user (Static). If Static is selected, the IP Address, Subnet Mask and Gateway

Address must be manually entered below. If DHCP is selected, the next three items will be configured automatically and will be grayed out. The options are Static and **DHCP**.

IP Address - Enter the IP address for this machine. This should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255.

Subnet Mask - Subnet masks tell the network which subnet the machine belongs to. The value of each three-digit number separated by dots should not exceed 255 (i.e., 255.255.255.0).

Gateway Address - Enter the IP address of the Gateway this machine will use (i.e., 192.168.10.1).

MAC Address - The BIOS will automatically enter the MAC address (also known as Hardware Address) of this machine, however it may be over-ridden. MAC addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.9E.73.CF)

BMC Watch Dog Timer Action

This feature allows the BMC to reset or power down the system if the operating system hangs or crashes. The options are **Disabled**, Reset System, Power Down, Power Cycle.

BMC WatchDog TimeOut [Min:Sec]

This option appears if BMC Watch Dog Timer Action (above) is enabled. This is a timed delay in minutes or seconds, before a system power down or reset after an operating system failure is detected. The options are **[5 Min]**, [1 Min], [30 Sec], and [10 Sec].

▶Event Log Configuration

View Event Log

Use this option to view the System Event Log.

Mark all events as read

This option marks all events as read. The options are OK and Cancel.

Clear event log

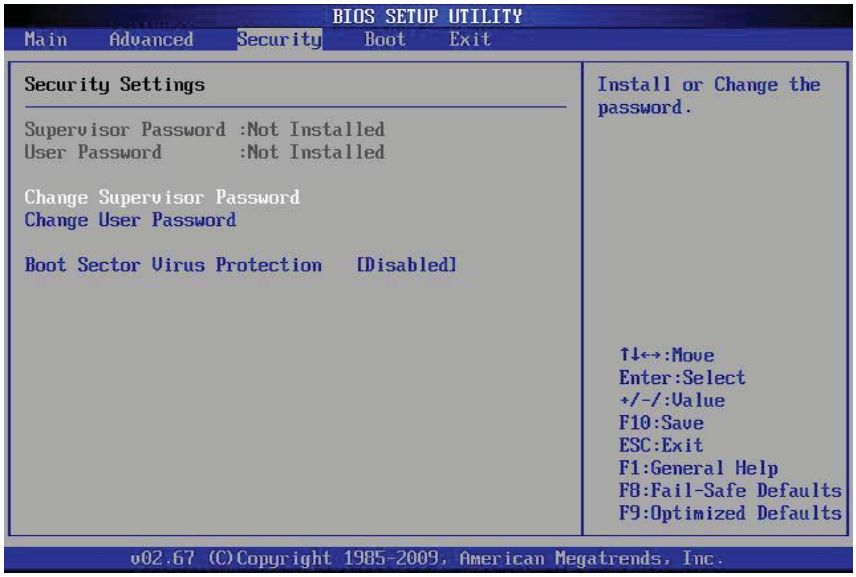
This option clears the Event Log memory of all messages. The options are OK and **Cancel.**

PCIE Error Log

Use this option to enable logging of errors encountered in the system's PCIe bus. The options are Yes and **No.**

7-4 Security Settings

The AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.



Supervisor Password

This item indicates if a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password:

This item indicates if a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Change Supervisor Password

Select this feature and press <Enter> to access the submenu, and then type in a new Supervisor Password.

User Access Level (Available when Supervisor Password is set as above)

Available options are **Full Access**: grants full User read and write access to the Setup Utility, View Only: allows access to the Setup Utility but the fields cannot be changed, Limited: allows only limited fields to be changed such as Date and Time, No Access: prevents User access to the Setup Utility.

Change User Password

Select this feature and press <Enter> to access the submenu , and then type in a new User Password.

Clear User Password (Available only if User Password has been set)

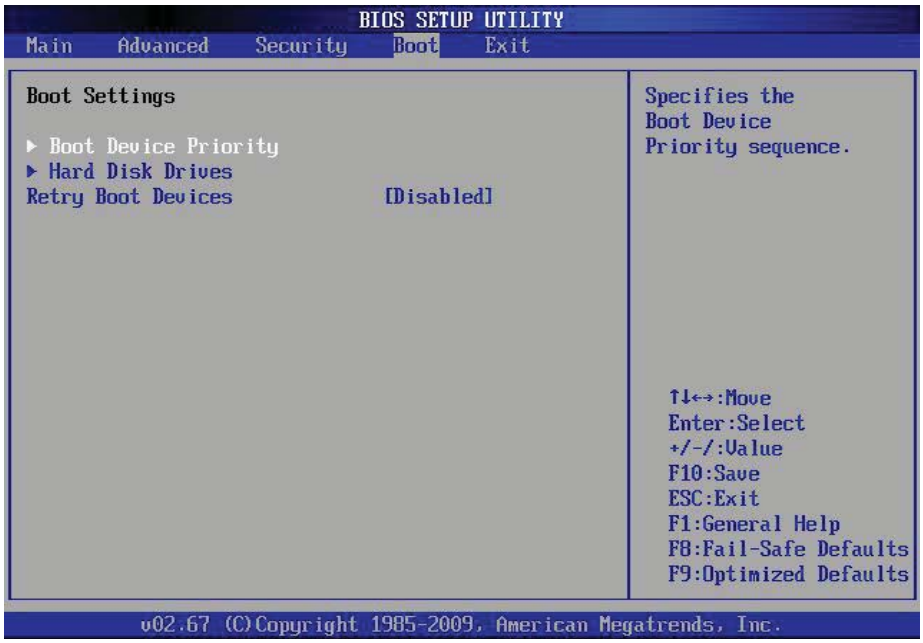
Password Check

Available options are **Setup** and Always.

Boot Sector Virus Protection

When Enabled, the AMI BOIS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

7-5 Boot Settings



Use this feature to configure Boot Settings:

▶Boot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device. The settings are 1st boot device, 2nd boot device, 3rd boot device, 4th boot device, 5th boot device and Disabled.

- 1st Boot Device - 1st Floppy Drive
- 2nd Boot Device - [USB: XXXXXXXXX]
- 3rd Boot Device - [SATA: XXXXXXXXX]
- 4th Boot Device - [Network: XXXXXXXXX]
- 5th Boot Device - [Network: XXXXXXXXX]

▶Hard Disk Drives

This feature allows the user to specify the sequence of priority from the available Hard Drives.

- 1st Drive [SATA: XXXXXXXXXX]
- 2nd Drive [SATA: XXXXXXXXXX]

▶Removable Drives

This feature allows the user to specify the boot sequence from available Removable Drives. The settings are 1st boot device, 2nd boot device, and Disabled.

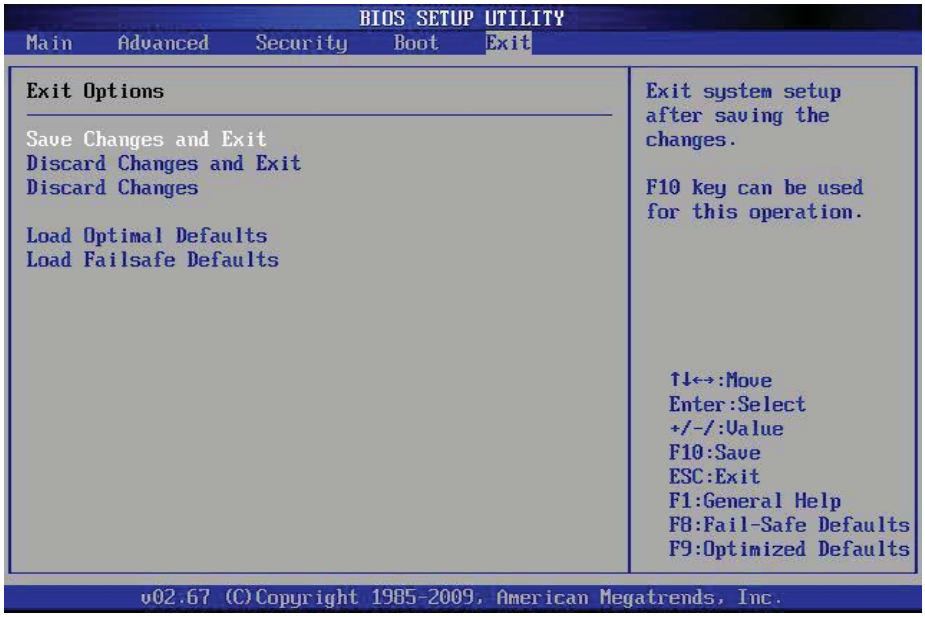
- 1st Drive
- 2nd Drive - [USB: XXXXXXXXX]

Retry Boot Devices

Select this option to retry booting from the configured boot devices if the systems fail to boot initially. The options are **Disabled** and Enabled.

7-6 Exit Options

Select the Exit tab from the AMI BIOS Setup Utility screen to enter the Exit BIOS Setup screen.



Save Changes and Exit

When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then, select OK to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.

Notes

Appendix A

POST Error Beep Codes

This section lists POST (Power On Self Test) error beep codes for the AMI BIOS. POST error beep codes are divided into two categories: recoverable and terminal. This section lists Beep Codes for recoverable POST errors.

Recoverable POST Error Beep Codes

When a recoverable type of error occurs during POST, BIOS will display a POST code that describes the problem. BIOS may also issue one of the following beep codes:

1 long and eight short beeps - video configuration error

1 repetitive long beep - no memory detected

1 continuous beep with the front panel Overheat LED on - system overheat

Notes

Appendix B

BIOS Recovery

The recovery procedure described in this section is to be used only when you are advised by your Supermicro Technical Support representative or in cases of emergencies where the system can no longer boot due to a corrupted BIOS. DO NOT reprogram (re-flash) the BIOS if your system is running properly.

B-1 Recovery from USB Device

If the BIOS file is corrupted and the system is not able to boot up, this feature will allow you to recover the BIOS image using a USB-attached device. A USB Flash drive or a USB CD/DVD ROM/RW drive may be used for this purpose. Please note that USB hard disk drives are NOT supported at this time. Below is the two-part procedure to recover the BIOS:

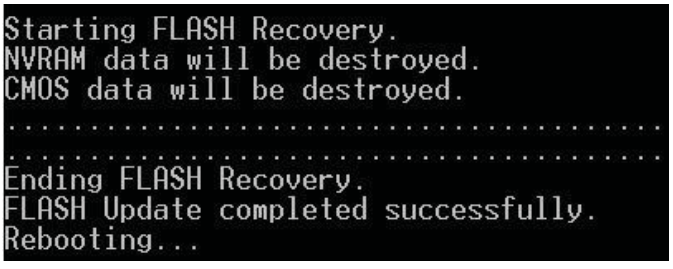
Part 1: Boot Sector Recovery Process

1. Using a different system, download and copy the correct BIOS binary image into a USB flash device or a writable CD/DVD disc's Root "\" Directory. Rename the downloaded file to "super.rom", so the recovery process can recognize and read the BIOS binary file.

2. Insert the USB device that contains the new BIOS binary image (“super.rom”) and power the system down.

3. While powering on the system, press and hold <Ctrl> and <Home> simultaneously on your keyboard until the USB device's LED indicator comes on. This will take a few seconds or up to one minute.

4. Once the USB device's LED is on, release the <Ctrl> and <Home> keys. The system may generate beep codes to indicate that the BIOS ROM firmware is being reprogrammed. The screen will also display a message as shown below. DO NOT INTERRUPT THIS PROCESS!



5. When the Boot Sector Recovery Process is complete, the system will reboot automatically and you will see a checksum error on your screen.

Part 2: BIOS Reprogramming (Re-Flashing)

After completing the Boot Sector Recovery Process, you will need to reprogram ("re-flash") the proper BIOS binary file again into the BIOS ROM in order to have the correct BIOS file loaded by the system. For details on how to flash/re-flash a BIOS, please check our website for "Update your BIOS", or see the section 3-3 (FAQ) of this manual. DO NOT INTERRUPT THIS PROCESS!

When completed, the system will reboot automatically, and you will see a checksum error again.

Press "F1" to go to setup. Press "F9" to load the defaults and then press "F10" to save and exit.

B-2 Recovery from an IDE/SATA ATAPI Drive

This process is identical to the Boot Sector Recovery Process from a USB Device/ Drive (as above), except that the BIOS image file ("super.rom") is loaded from an IDE/ATAPI CD/DVD/ROM/RW disc drive that is attached to the system. Note that loading from an IDE/SATA hard disk drive is NOT supported.

1. Using a different system, download and copy the correct BIOS binary image into a writable CD/DVD disc's Root "\" Directory. Rename the downloaded file to "super.rom", so the recovery process can recognize and read the BIOS binary file.

   Note: Record/Burn the CD/DVD-R/RW disc using the ISO 9600 standard format. Refer to your CD/DVD mastering application documentation for instructions on how to do this.

2. Insert the newly-created disc into the IDE/SATA ATAPI CD/DVD ROM/RW drive of the system that has the corrupted BIOS and power the system down.

3. Follow the step-by-step instructions under Part 1 - Recovery Process from a USB Device/Drive (above) starting from Step 3 and continue on to Part 2 - BIOS Reprogramming (Re-Flashing).

If your system still does not boot up after performing the above procedure, then there may be other issues with your motherboard. Please contact your customer service representative.

Appendix C

System Specifications

Note: unless noted specs apply to a complete system (both serverboards).

Processors

Two Intel® Xeon® 3400 and L3400 Series, Core™ i3 and Pentium® G6950 processors (LGA1156 socket)

Note: please refer to our website for details on supported processors.

Chipset

Intel 3420 chipset

BIOS

32 Mb AMI SPI Flash ROM

Memory Capacity

Six 240-pin, DDR3 ECC SDRAM DIMM sockets with support for up to 16GB of UDIMM or up to 32GB of RDIMM 1333/1066/800 MHz memory

Note: refer to Section 5-6 for details on installation.

SATA Drive Bays

Twenty four hot-swap drive bays to house standard SATA drives (six per node)

PCI Expansion

Four low-profile PCI-Express x16 2.0 slots (one each node)

Serverboard

X8SiT-HF (proprietary form factor)
Dimensions: 6.5 x 16.4 in (165 x 417 mm)

Chassis

SC217HQ-R920B (2U Rackmount)
Dimensions: (WxHxD) 17.2 x 3.5 x 26.75 in. (437 x 89 x 679 mm)

Weight

Gross Weight: 85 lbs. (38.6 kg.)

System Cooling

Four 8-cm PWM (Pulse Width Modulated) fans

System Input Requirements

AC Input Voltage: 100 - 240V AC auto-range
Rated Input Current: 13 - 4A max
Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 920W (Part# PWS-920P-1R)
Rated Output Voltages: +12V (75A), +5Vsb (4A)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 20% to 95% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

Notes

(continued from front)

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