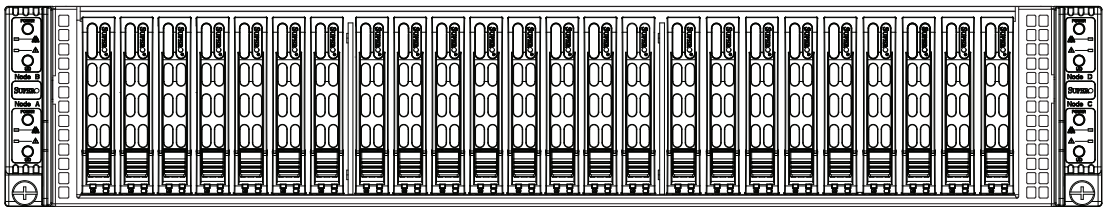
SUPERO®

2U Twin^{3}™
SuperServer 2015TA-HTRF



USER'S MANUAL

Revision 1.0

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WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

Manual Revision 1.0
Release Date: April 19, 2011

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 2015TA-HTRF. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 2015TA-HTRF is a 2U Twin^3 (eight serverboards/nodes in a 2U chassis) rackmount server based on the SC217HO-R720B server chassis and eight Super X7SPT-DF-D525 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 X7SPT-DF-D525 serverboard and the SC217HO-R720B chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 2015TA-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 2015TA-HTRF.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X7SPT-DF-D525 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 SC217HO-R720B 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 2015TA-HTRF is a 2U Twin^3 rackmount server. The 2015TA-HTRF is comprised of two main subsystems: the SC217HO-R720B chassis and eight X7SPT-DF-D525 motherboards. Please refer to our web site for information on operating systems that have been certified for use with the 2015TA-HTRF.

In addition to the mainboard and chassis, various hardware components may have been included with the 2015TA-HTRF, as listed below.

- One CD containing drivers and utilities
- SuperServer 2015TA-HTRF User's Manual

1-2 Motherboard Features

At the heart of the SuperServer 2015TA-HTRF are eight X7SPT-DF-D525 motherboards, which are single processor, low-power motherboards based upon Intel's ATOM D525 + ICH9R chipset. Below are the main features of the X7SPT-DF-D525.

Processor

The X7SPT-DF-D525 supports one Intel® Atom™ D525 1.8 GHz processor. The processor is embedded in the motherboard.

Memory

The X7SPT-DF-D525 has two DIMM slots that can support up to 4 GB of unbuffered non-ECC DDR3-800 SO-DIMM memory.

Onboard SATA

A SATA controller is built into the ICH9R portion of the chipset to provide support for a six port, 3 Gb/sec SATA subsystem (RAID 0, 1, 10 supported - RAID 5 is supported by Windows only).

Onboard Controllers/Ports

Onboard I/O backpanel ports include a VGA port, PS/2 mouse and keyboard ports, two Gb LAN ports and two USB ports. Additional USB headers 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, virus protection and BIOS rescue.

Onboard Graphics

A Matrox G200eW graphics/video controller is integrated into the X7SPT-DF-D525.

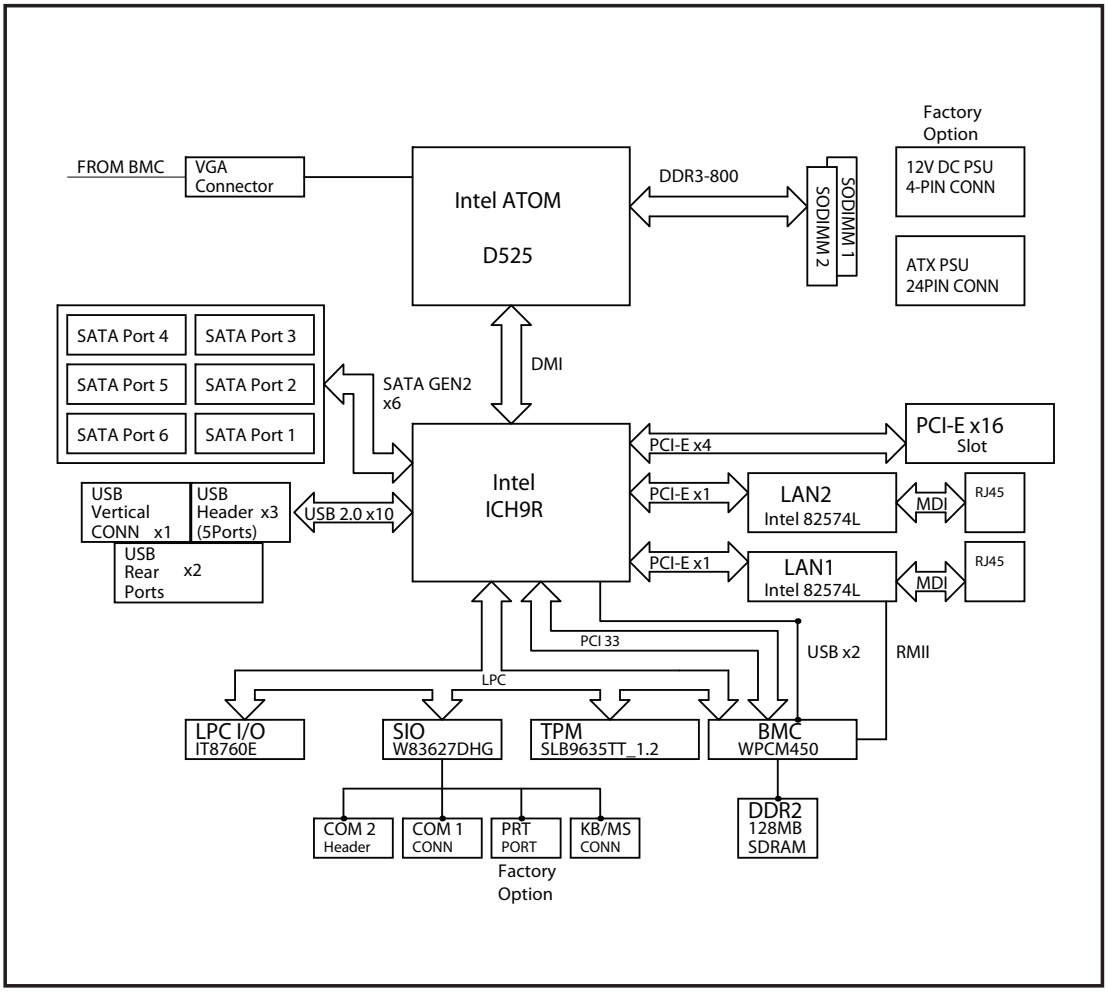

Figure 1-1. Intel Atom D525 + ICH9R Chipset: System Block Diagram

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 SC217HO-R720B 2U chassis. Details on the chassis can be found in Chapter 6.

System Power

The SC217HO-R720B includes a redundant (dual) 720W power supply, which provides power to both serverboards (nodes). If either power supply fails, the other will allow the system to continue to run.

SATA Subsystem

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

Control Panel

The SC217HO-R720B features four independant control panels. Each control panel has LEDs to indicate power on, network activity, power fail, fan fail and system overheat conditions for its own specific node. Each control panel also includes a main power button.

Rear I/O Panel

Eight separate I/O panels (one for each X7SPT-DF-D525 motherboard) are included on the SC217HO-R720B chassis. Each supports two USB ports, one VGA port and two Gb Ethernet LAN ports (one LAN port is shared with an IPMI port). See Chapter 6 for details.

Cooling System

The SC217HO-R720B 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 Twin^3: System Notes

As a 2U Twin^3 configuration, the 2015TA-HTRF is a unique server system. With eight system boards incorporated into a single chassis acting as eight separate nodes, there are several points you should keep in mind.

Nodes

Each of the serverboards act as a separate node in the system. With two nodes housed in each of four hot-swap trays, two may be powered off and on without affecting the others. In addition, each tray with its two nodes 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 720W 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 2015TA-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 three drives to each serverboard. Consequently, RAID setup is limited to a three-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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Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get the 2015TA-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

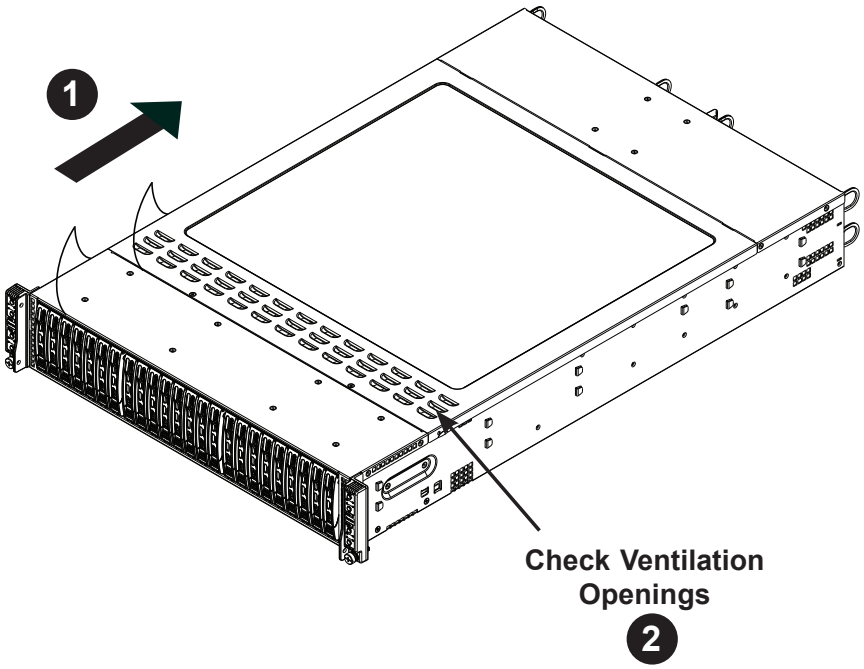
Before operating the server for the first time, it is important to remove the protective film covering the top of the chassis, in order to allow for proper ventilation and cooling.

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

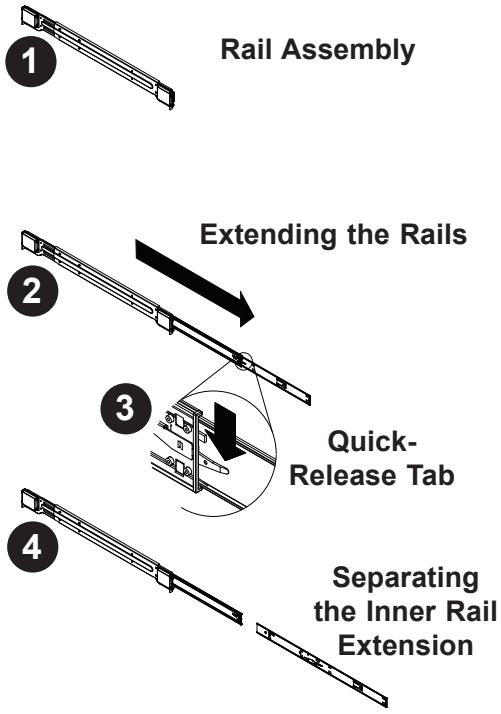
This section provides information on installing the SC217 chassis into a rack unit with the quick-release rails provided. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with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

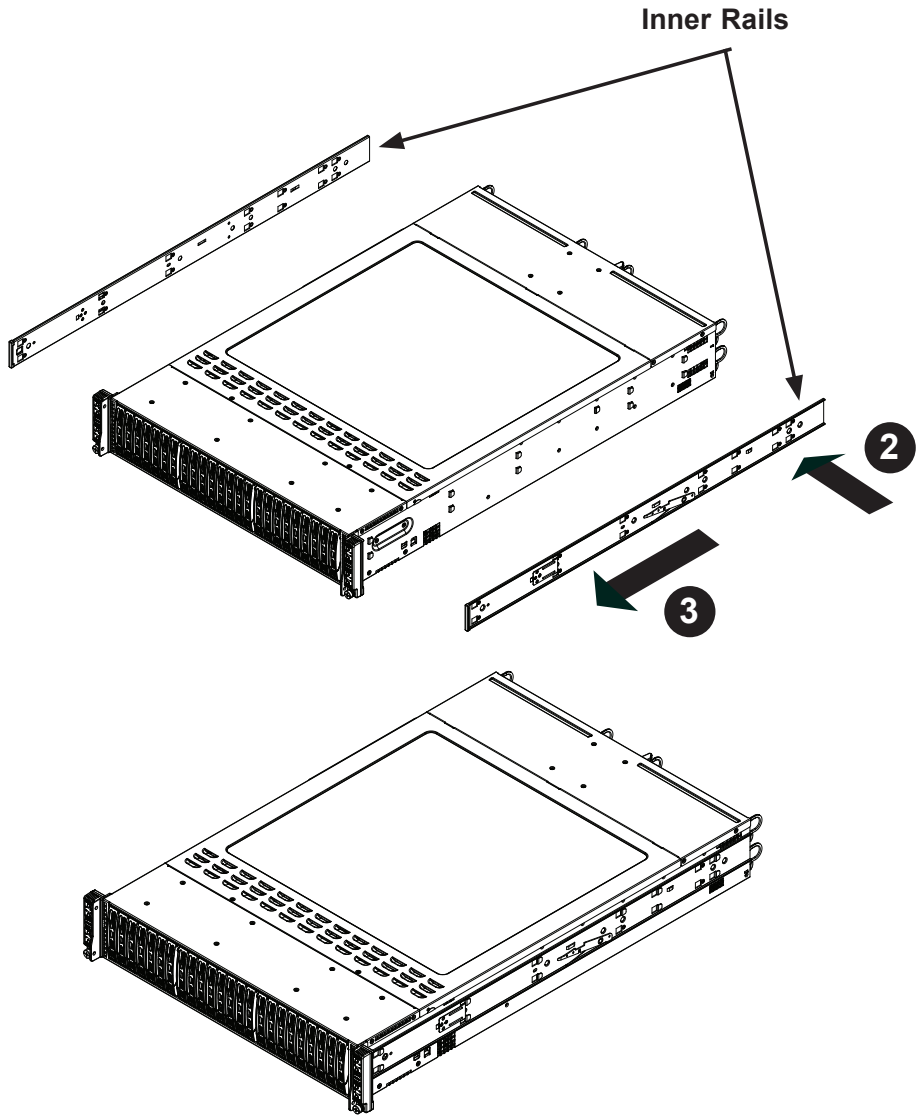


Figure 2-3: Installing the Inner Rails

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.

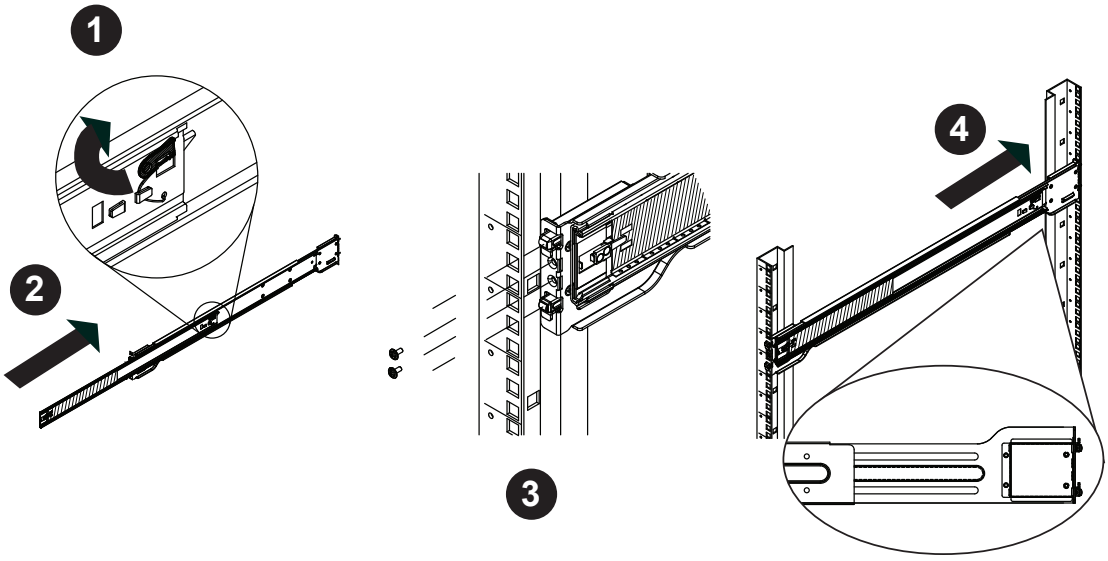


Figure 6-5: Extending and Releasing the Outer Rails

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.

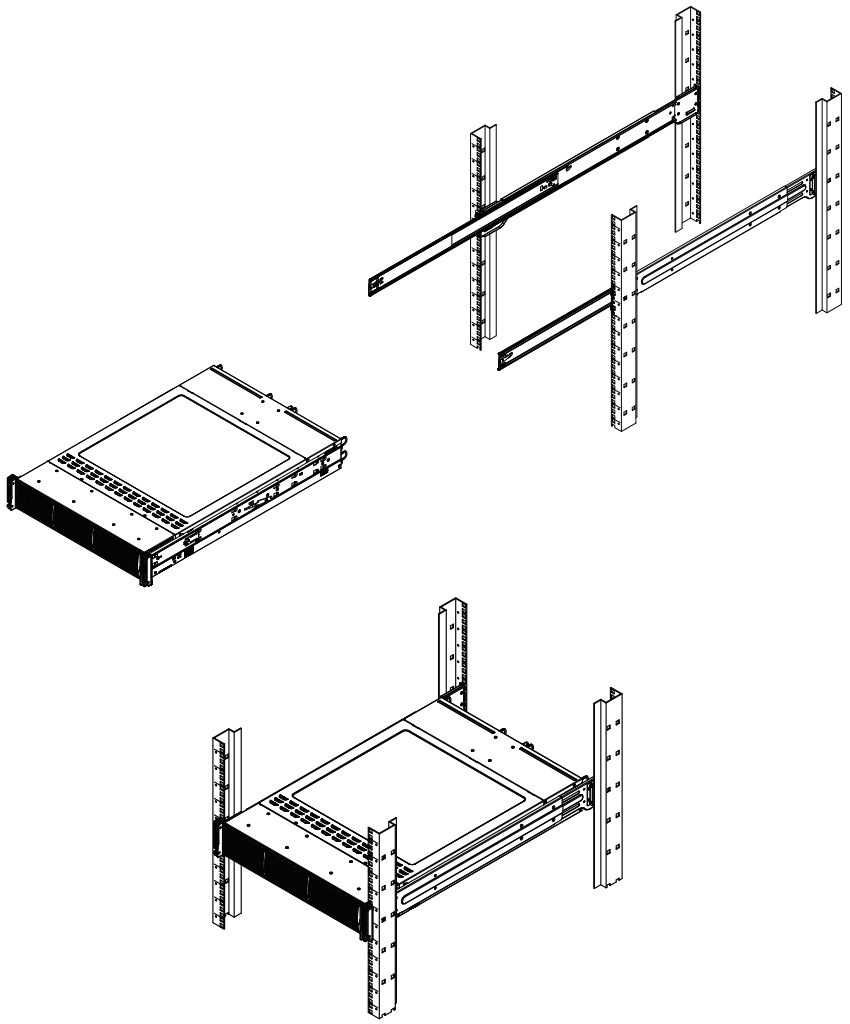


Figure 6-6: Installing into a Rack

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 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 eight 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.

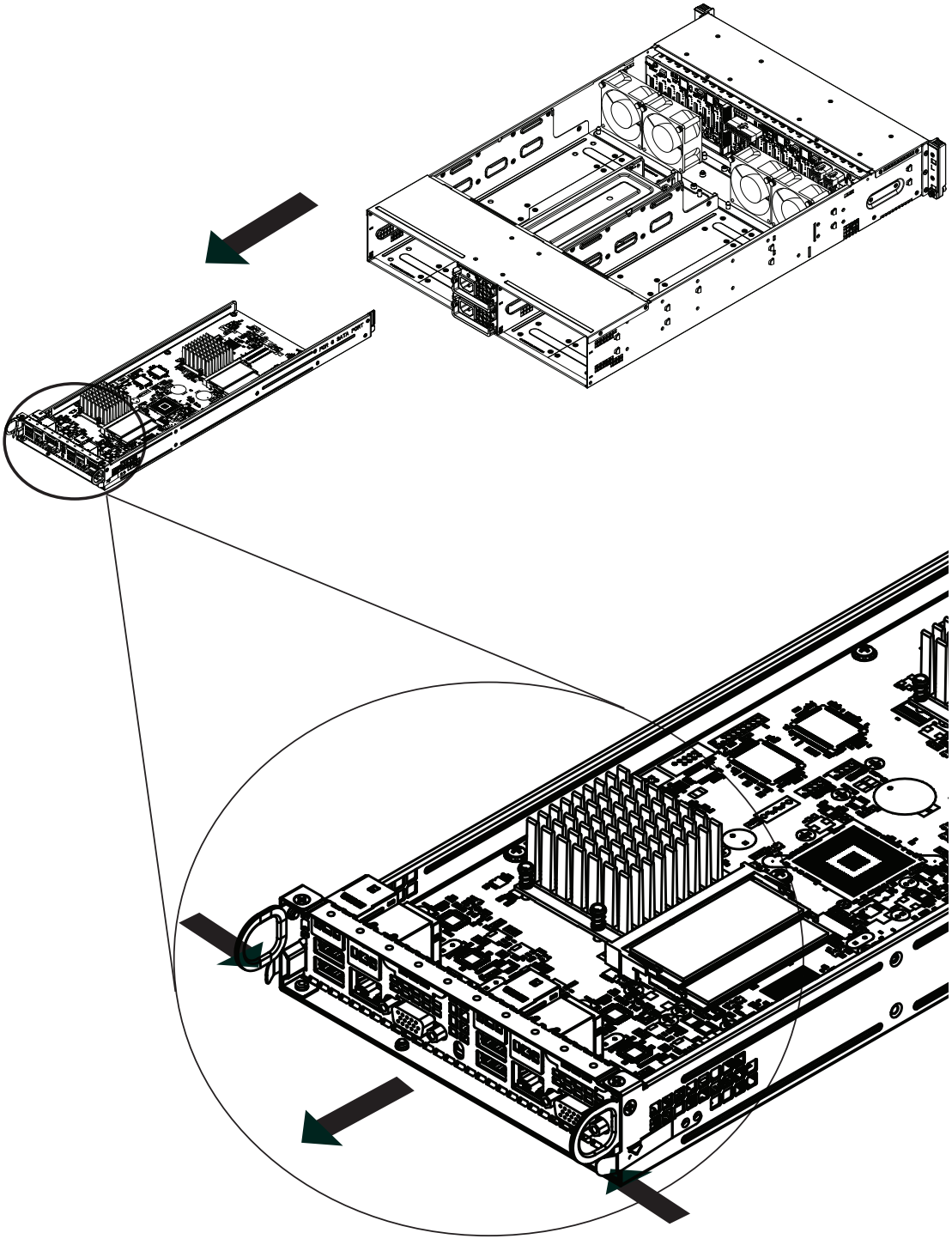
Providing Power

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

Each control panel has its own power on/off 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.

3-3 Control Panel LEDs

In addition to the LEDs built into the power 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 2015TA-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 2015TA-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.

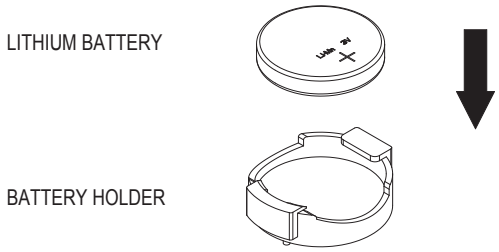
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 2015TA-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 X7SPT-DF-D525 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.

Unpacking

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

5-2 Motherboard Installation

This section explains the first step of physically mounting the X7SPT-DF-D525 into the SC217HO-R720B. 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 cable (with its location noted) should be connected. (See the motherboard layout for connector locations.)

- Control Panel cable (JF1)

Connecting Power Cables

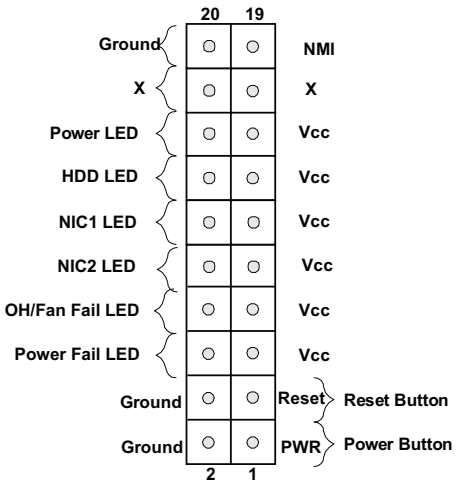
The X7SPT-DF-D525 has a 24-pin primary power supply connector (JPW1) for connection to the ATX power supply. See Section 5-9 for power connector pin definitions.

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.

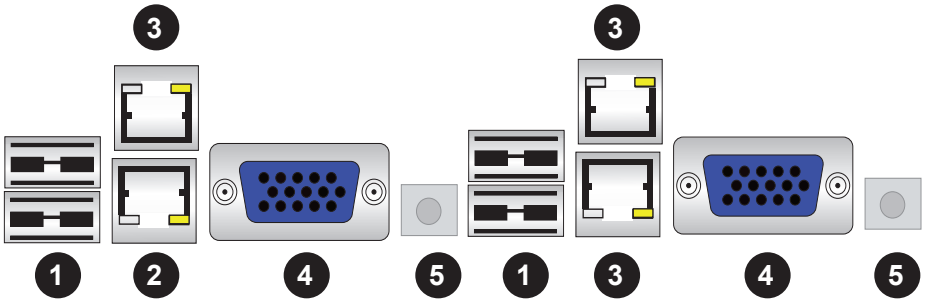
Figure 5-1. Control Panel Header Pins



5-4 I/O Ports

The 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. I/O Ports



Rear I/O Ports	
1. USB0/1	4. VGA Port
2. LAN1 Port	5. UID Button
3. LAN2 Port	

*OEM option.

5-5 Onboard Processor

The Intel Atom processor is soldered directly onto the motherboard. Installing and removing the processor is not required. A small active heatsink sits on the processor to keep it cool.

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 SO DIMMs into the memory slots, starting with DIMM1 then DIMM2. Insert each DIMM vertically into its slot while paying attention to the notch along the bottom of the module to prevent incorrect installation.

2. Gently press down on the DIMM module until it snaps into place in the slot. Repeat step 1 to install DIMM2 if needed. See diagrams on the following page.

Memory Support

There are two nodes on each X7SPT-DF-D525 in the system. Each node supports up to 4GB of unbuffered Non-ECC DDR3 SODIMMs (800MHz in two SO DIMM slots.) Populating these DIMM slots with a pair of memory modules of the same type and same size will result in interleaved memory, which will improve memory performance.

Note: Refer to the Supermicro website for a list of memory modules that have been validated with the X7SPT-DF-D525 motherboard.

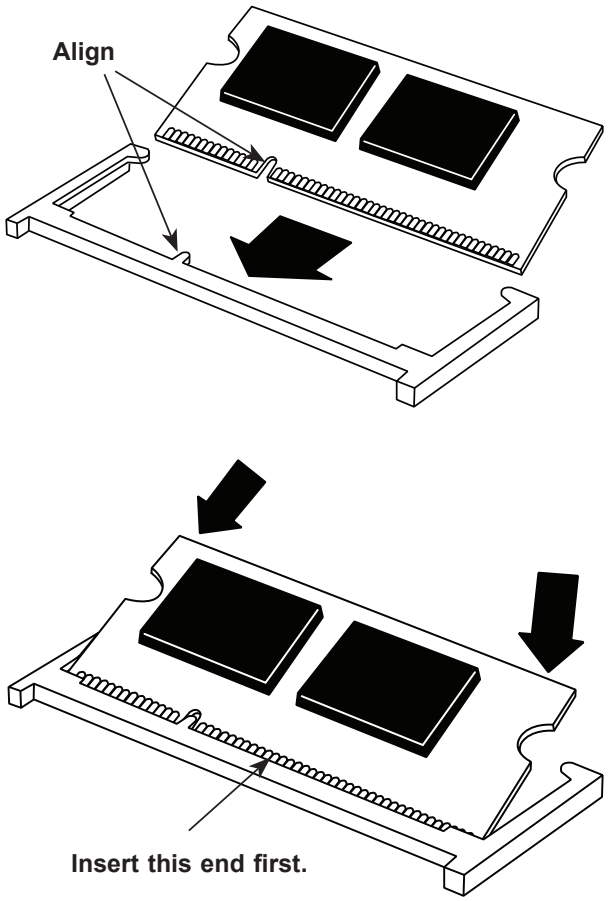
Figure 5-3. DIMM Installation

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

2. Insert the SO-DIMM module vertically at about a 45 degree angle.

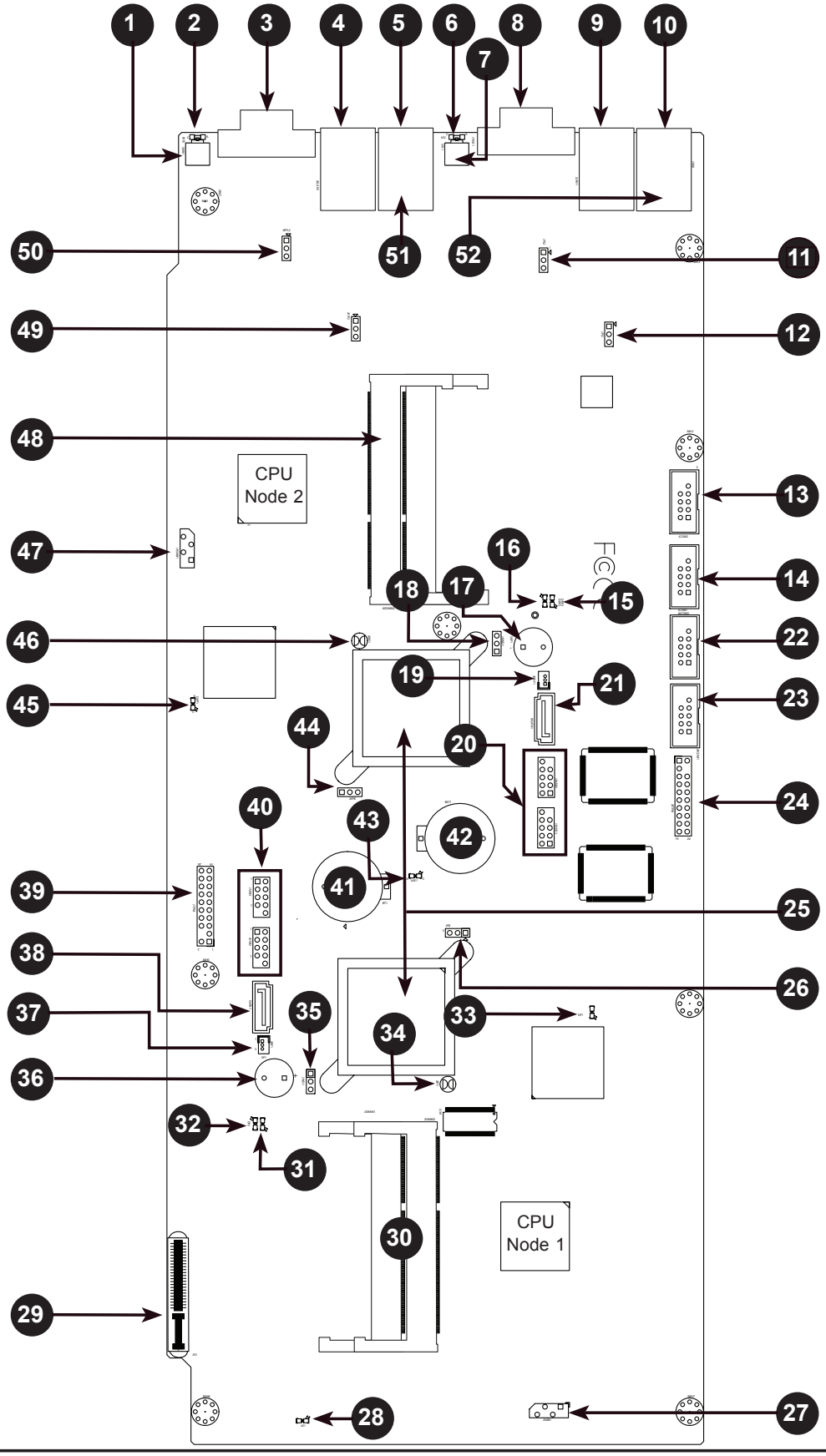
3. Press down until the module locks into place. The side clips will automatically secure the SO DIMM module, locking it into place.

4. To Remove: Use your thumbs to gently push the side clips near both ends away from the module. This should release it from the slot. Pull the SO DIMM module upwards.



5-7 Motherboard Details

Figure 5-4. X7SPT-DF-D525 Layout



Number	Connector	Description
3,8	JKVGA1, JVGA1	Video/Graphics Connector
4,9	JKLAN1/JKLAN2, JLAN1/JLAN2	RJ45 Connector for LAN1 and LAN2
5,10	JK666, J666 (top)	IPMI Dedicated LAN
13, 22	JCOM2,JKCOM2	Internal Serial Port (COM2)
14, 23	JCOM1,JKCOM1	Internal Serial Port (COM1)
17, 36	SKP1, SP1	Onboard Speaker
24, 39	JKTPM, JTPM	TPM Header
25	U1/UK2	ICH9
27, 47	JSMB1, JKSMB1	System Management Bus header
30	JDIMM1, JDIMM2	SO-DIMM Slots (Node 1)
48	JKDIMM1, JKDIMM2	SO-DIMM Slots (Node 2)
29	JF2	Hot Plug Connector
19, 37	JKWF1, JWF1	SATA Disk on Module (DOM) Power
21, 38	IKSATA1, ISATA1	SATA 1 Connector
20, 40	JKUSB2/3, JUSB2/3	USB Headers
41, 42	BT1,BKT1	Onboard Battery
51, 52	J666, JK666 (bottom)	Back Panel USB 2.0 Ports (JUSB0/JUSB1, JKUSB0/JKUSB1)

Number	LED	Description
2,6	LKE2, LE2	Unit ID LED
28, 43	LE1,LKE1	3.3V Dual LED
16, 31	DKP2, DP2	Power LED
15, 32	DKP3, DP3	SATA LED
45, 33	DKP1, DP1	BMC Heartbeat LED

Number	Jumper	Description	Default Setting
1,7	SKW1,SW1	Unit ID Switch	**Open**
11, 50	JPL2, JKPL2	LAN2 Enable/Disable	Pins 1-2 (Enabled)
12, 49	JPL1, JKPL1	LAN1 Enable/Disable	Pins 1-2 (Enabled)
26, 44	JPB,JKPB	BMC Enable/Disable	Pins 1-2 (Enabled)
18, 35	JKWD1, JWD1	Watch Dog Timer Mode	Pins 1-2 (Reset)
34, 46	JBT1,JKBT1	CMOS Clear	(See Section 5-9)

Notes: All jumpers, connectors, and LEDs with a "K" in the name are for Node 2. The rest are for Node 1 or shared between the two. Jumpers not indicated are for test purposes only.

5-8 Connector Definitions

Serial Ports (OEM Option)

Two onboard serial port headers (COM1, COM2) are located on the motherboard for each node. See the table on the right for pin definitions.

Serial Ports COM1/COM2 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	N/A

Universal Serial Bus

For each node, there are two USB headers located on the motherboard to provide front chassis access. (Cables are not included.) See the table on the right for pin definitions.

Back Panel USB0/1 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 2/3, USB 4/5 Pin Definitions

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

Front Panel Accessible Add-on Card Header

The JF2 add-on card header provides front access to the power supply, Serial ATA and Front Panel Control connections for the motherboard. Plug an add-on card into this header to use the functions indicated above. This header is designed specifically for this motherboard.

Onboard Speaker

An onboard speaker/buzzer is provided for each node (SKP1/SP1). This device provides audible status messages for the motherboard.

TPM Header (JTPM/JKTPM)

This header is used to connect a Trusted Platform Module (TPM) from a third-party vendor. A TPM is a security device that allows encryption and authentication of hard drives. It enables the motherboard to deny access if the TPM associated with the hard drive 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

SMB

A System Management Bus (SMB) header is located at JSMB1 for Node 1 and at JKSMB1 for Node 2. Connect the appropriate cable here to use the SMB I2C connection on your system.

SMB Header Pin Definitions

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

SATA DOM Power (OEM Option)

The SATA DOM Power on JWF1 for Node 1 and JKWF1 for Node 2 is used to supply power to SATA Disk-on-Module (DOM) solid-state storage devices.

JSMB1 (Node 1)
JKSMB1 (Node 2)
JWF1 (Node 1)
JKWF1 (Node 2)

SATA DOM Power Pin Definitions

Pin#	Definition
1	VCC
2	Ground
3	Ground

LAN Ports

For each node: There are LAN ports located on the I/O back panel. These ports accept RJ45 type cables. There are two Ethernet ports (LAN1 & LAN2) for each node on the motherboard

Note: Please refer to the Onboard Indicators section for LAN LED information.

LAN Port Pin Definitions

Pin #	Definition	Pin #	Definition
1	TX_D1+	5	BI_D3-
2	TX_D1-	6	RX_D2-
3	RX_D2+	7	BI_D4+
4	BI_D3+	8	BI_D4-

Rear UID (Unit ID) Button

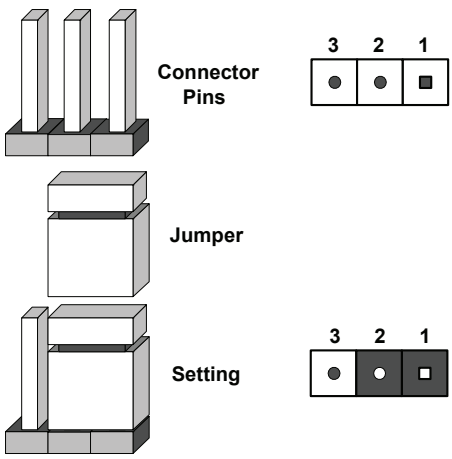
The Rear UID button is used together with the front panel UID LED and rear UID LED (located next to the UID button). The rear UID button makes it easier to identify or 'mark' the unit by turning on both the blue UID LED on the back panel and the UID LED on the front panel simultaneously. It enables the user to locate the system from either side of the chassis when, for example, the system is installed for example with several units.

5-9 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 the JPL1/JKPL and JPL2/JKPL2 jumpers enable or disable the LAN1 and LAN2 Ethernet 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 (I^2C) Bus to PCI Slots

Jumpers JI^2C1 and JI^2C2 allow you to connect the System Management Bus (SMB) to the PCI-E PCI slot. The default setting is Disabled. See table on the right for jumper settings.

I^2C to PCI-Slots Jumper Settings	
Jumper	Definition
On	Enabled
Off	Disabled

Watch Dog Enable/Disable

Watch Dog (JWD1/JKWD1) is a system monitor that can reboot the system when a software application hangs. Close pins 1 and 2 to reset the system if an application hangs the default setting). Close pins 2 and 3 to generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

Watch Dog Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	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 pins 1 and 2 to Enable BMC. See the table on the right for jumper settings.

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

5-10 Onboard Indicators

LAN1/2 LEDs

A total of four LAN (Ethernet) ports are located on the I/O back panel. Each have two LEDs. 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

Unit ID LEDs (LE2/LKE2)

There are two unit ID LEDs on the motherboard, one for each node. Each Unit ID LED is associated with a Unit ID switch. The Unit ID Switch activates the Unit ID LED next to it, and the corresponding Unit ID LED on the front panel of the chassis (if so equipped). This enables a user or a service person to easily identify which unit is being serviced from behind or in front of the system, a mounting rack or cabinet by simply looking at what chassis has its Unit ID LED activated.

Main Power LED (LE1/LKE1)

There are two main power LEDs on the motherboard, one for each node. This LED indicates that power from the power supply is reaching the motherboard (hard switched, usually on the power supply).

Power/Suspend LED (DP2/DKP2)

There are two Power/Suspend LEDs on the motherboard, one for each node. This LED indicates that the system is turned on (soft switched). When this LED is blinking, it indicates that the system is on suspend mode.

SATA LED (DKP3/DP3)

There are two SATA LEDs on the motherboard, one for each node. When this LED is blinking, it indicates activity on the system's SATA port(s).

BMC Heartbeat LED (DKP1/DP1)

There are two BMC Heartbeat LEDs on the motherboard, one for each node. When this LED is blinking, it indicates that the Baseboard Management Controller (BMC) is activated.

5-11 SATA Ports

SATA Ports

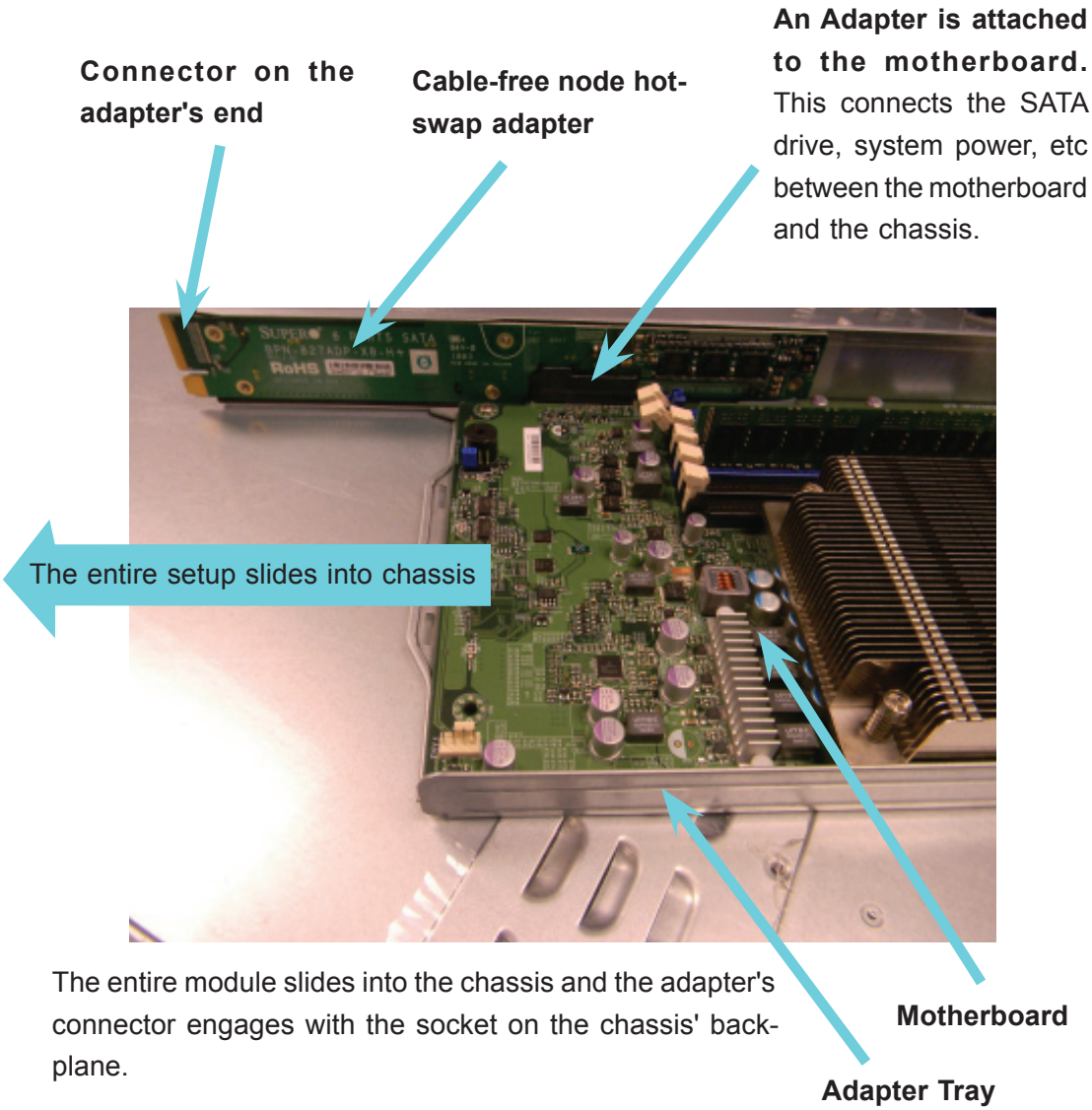
Four Serial ATA (SATA) ports are supported on each node. IKSATA/ISATA1 are located on the motherboard while the rest are supported through the hot-plug using an adapter card (see JF2, 2-13). These four SATA ports are supported by the Intel ICH9R South Bridge. See the table on the right for pin definitions.

SATA Port Pin Definitions

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

5-12 Node Hot-Swapping

The X7SPT-DF-D525 supports cable-free node hot-swapping when installed in a Supermicro 2U Twin^3 server chassis together with the cable-free hot-swap adapter (both sold separately). Node hot-swapping enables the user to replace a motherboard in a multi-node server without powering down the entire system. However, cable-free node hot-swapping allows node hot-swapping without the tedious task of unplugging and plugging back all the supporting cables between the chassis and motherboard. This is done by mounting the motherboard on a tray and attaching the tray's adapter to the motherboard. The adapter has a connector on its end that plugs into the server's backplane. This serves as the connection between the motherboard and all the components mounted in the chassis. Thus the term 'cable-free'. It also enables the motherboard to easily slide in and out of the chassis for easy maintenance. See the figure below for more information.



The entire module slides into the chassis and the adapter's connector engages with the socket on the chassis' backplane.

Note: The image is for illustration purposes only and may not be the same motherboard described in this manual.

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 (example shown)

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.

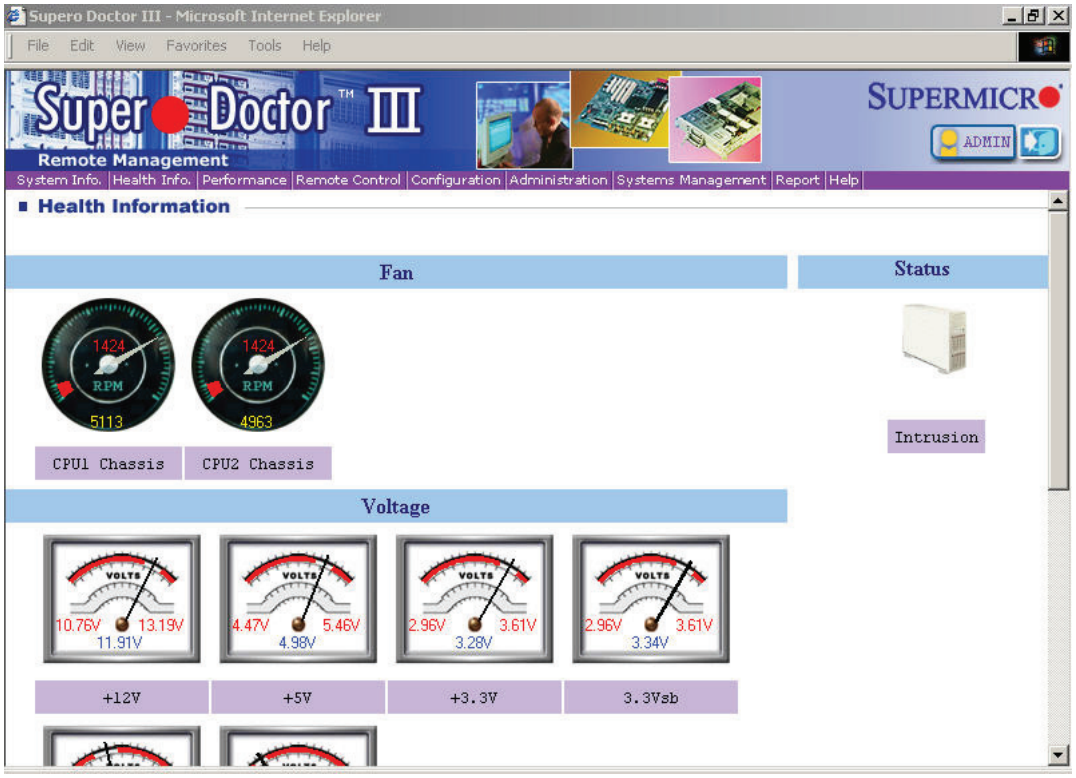
Supero Doctor III

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/manuals/other/SDIII_User_Guide.pdf>. For Linux, we will recommend using Supero Doctor II.

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC217HO-R720B 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

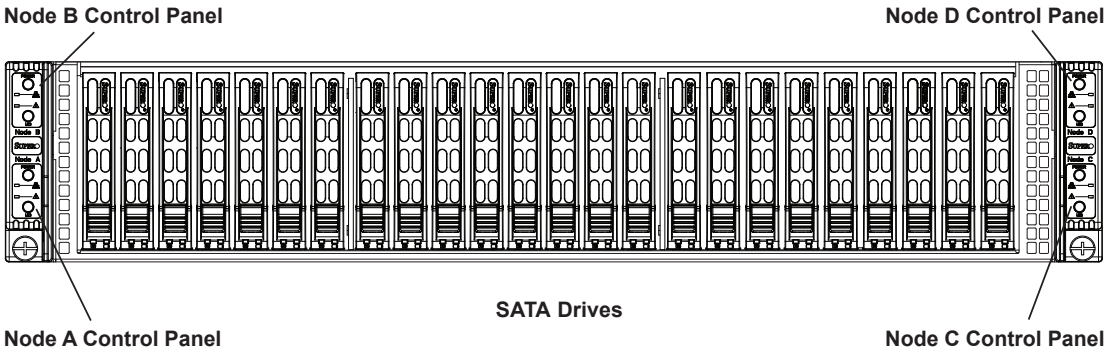
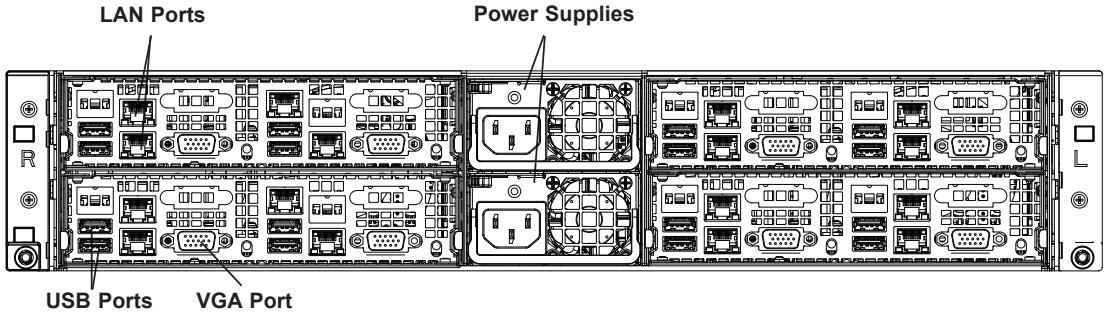


Figure 6-2. Chassis Rear View



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. The control panel 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 all 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^3, each node (serverboard) controls the fans that reside on its side of the chassis. This means that four 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 nodes/serverboards will operate both fans.

Note: Due to this configuration, all 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

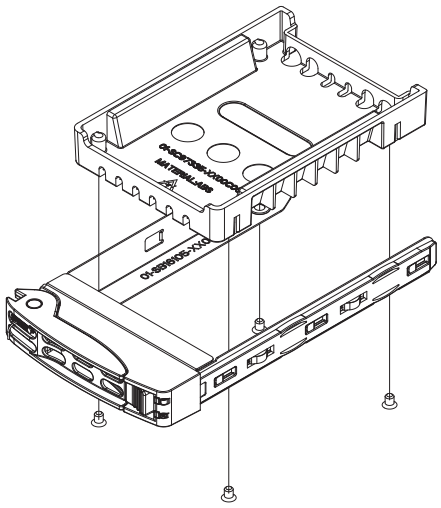
Mounting a Hard Drive in a Carrier

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 6-5).

Figure 6-4. Removing a Hard Drive

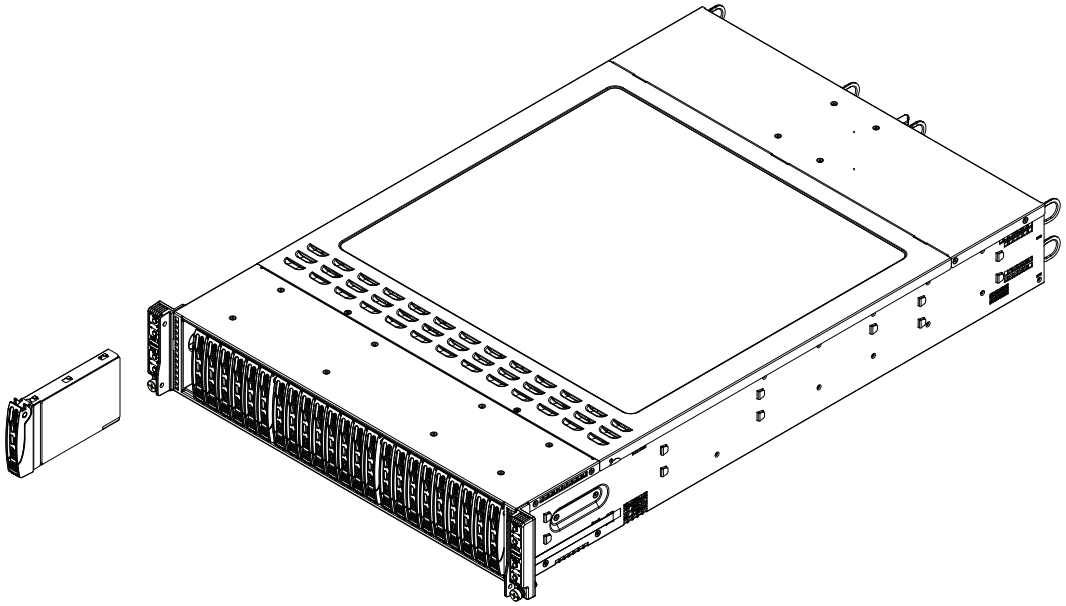
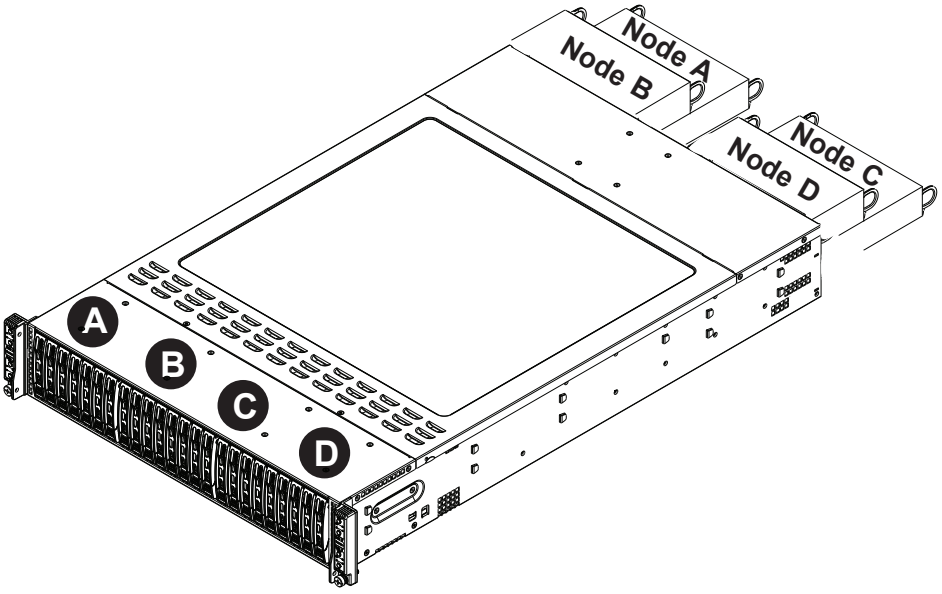


Figure 6-5. Drives and Nodes: Logical Configuration



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

6-5 Node Installation/Removal

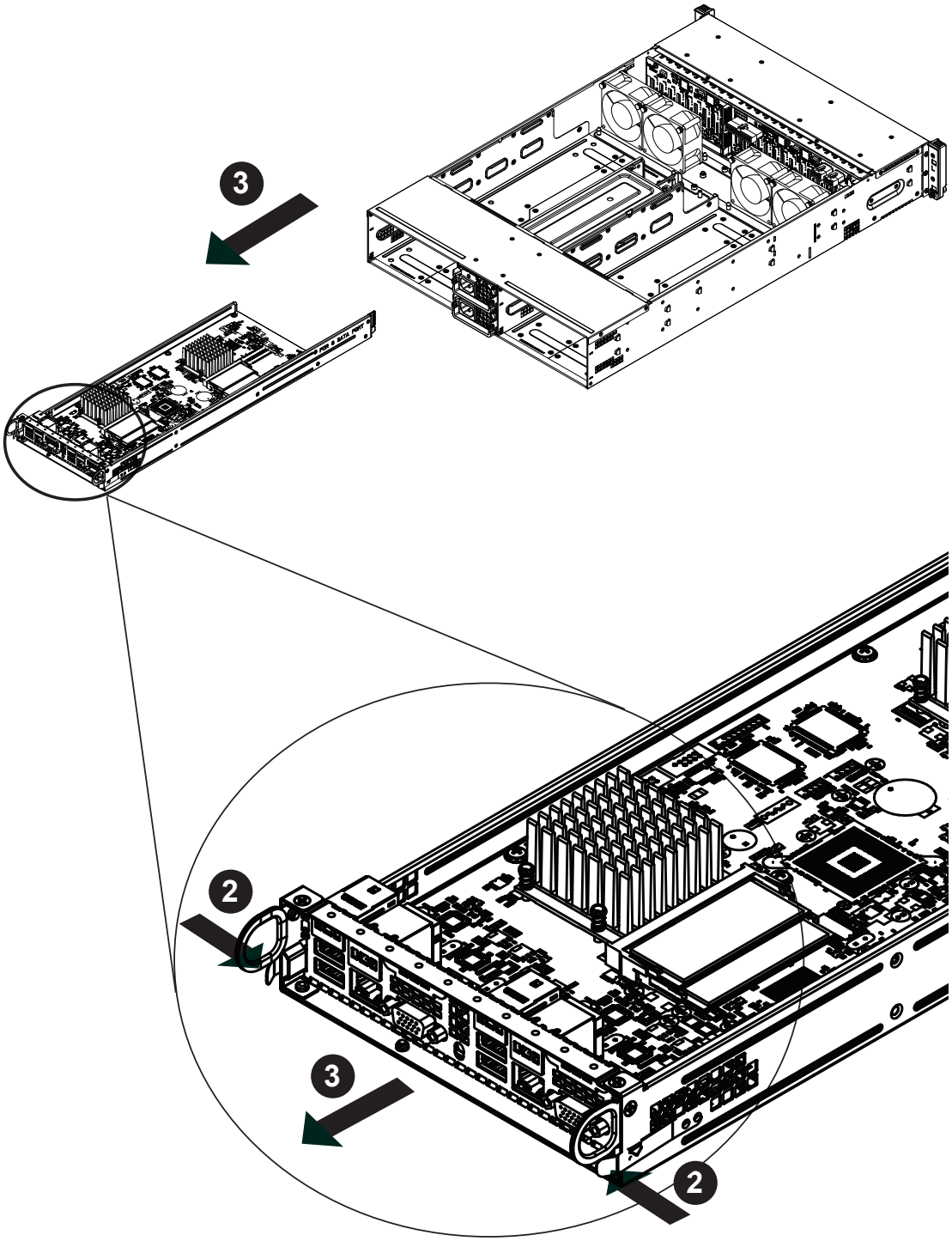
As with any server system, power must be removed from the serverboard when upgrading or installing memory or processors. In the 2U Twin^3 server, the serverboards (nodes) are capable of being hot-swapped from the chassis, allowing some to be powered down for servicing while the others continue operating.

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 6-6. Removing a System Node



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

6-6 Power Supply

The SuperServer 2015TA-HTRF server has two 720 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 6-7)

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

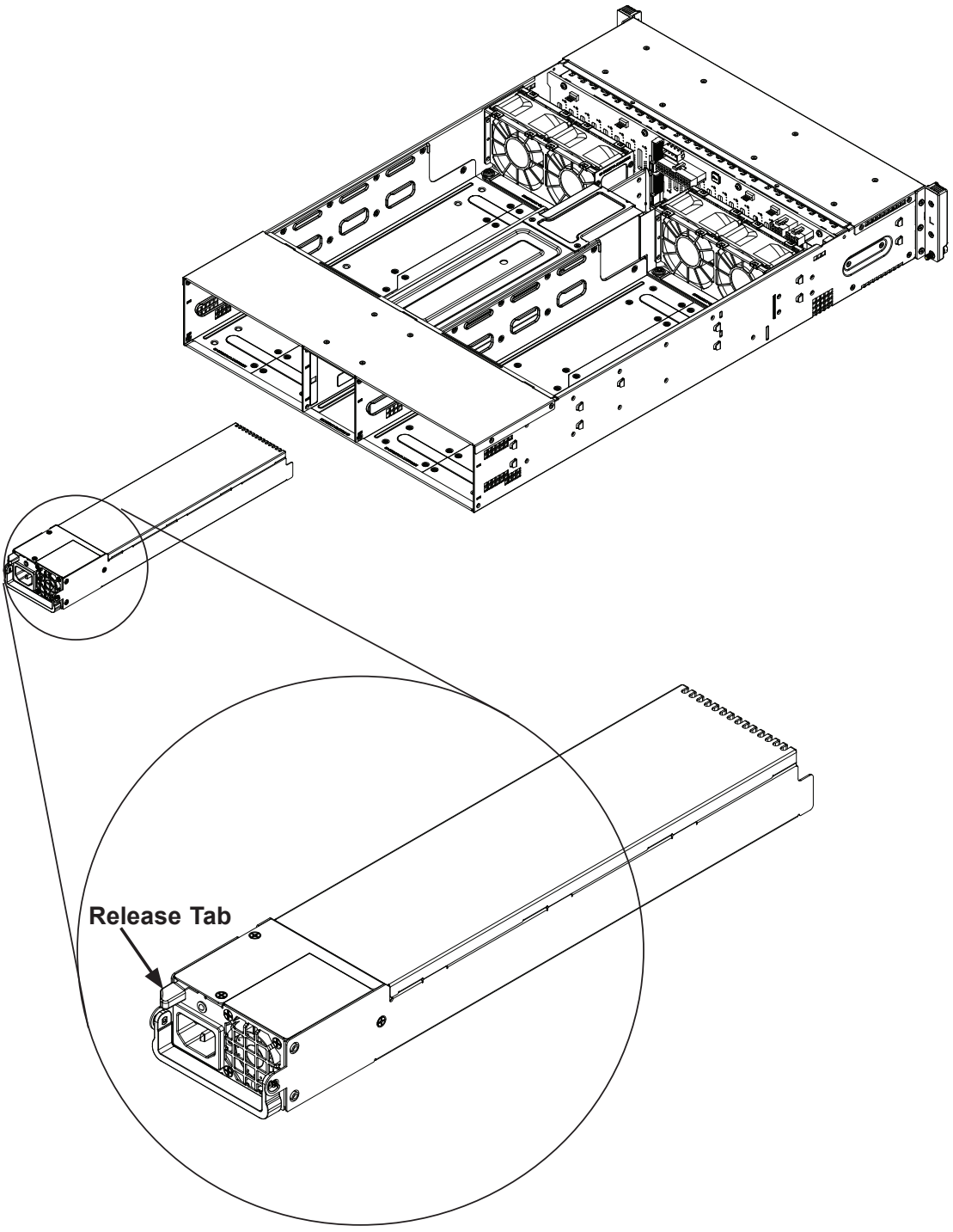
2. Push the colored release tab to the side and pull the power module out with the handle provided.

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 6-7. Removing the Power Supply



Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X7SPT-DF-D525. 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.

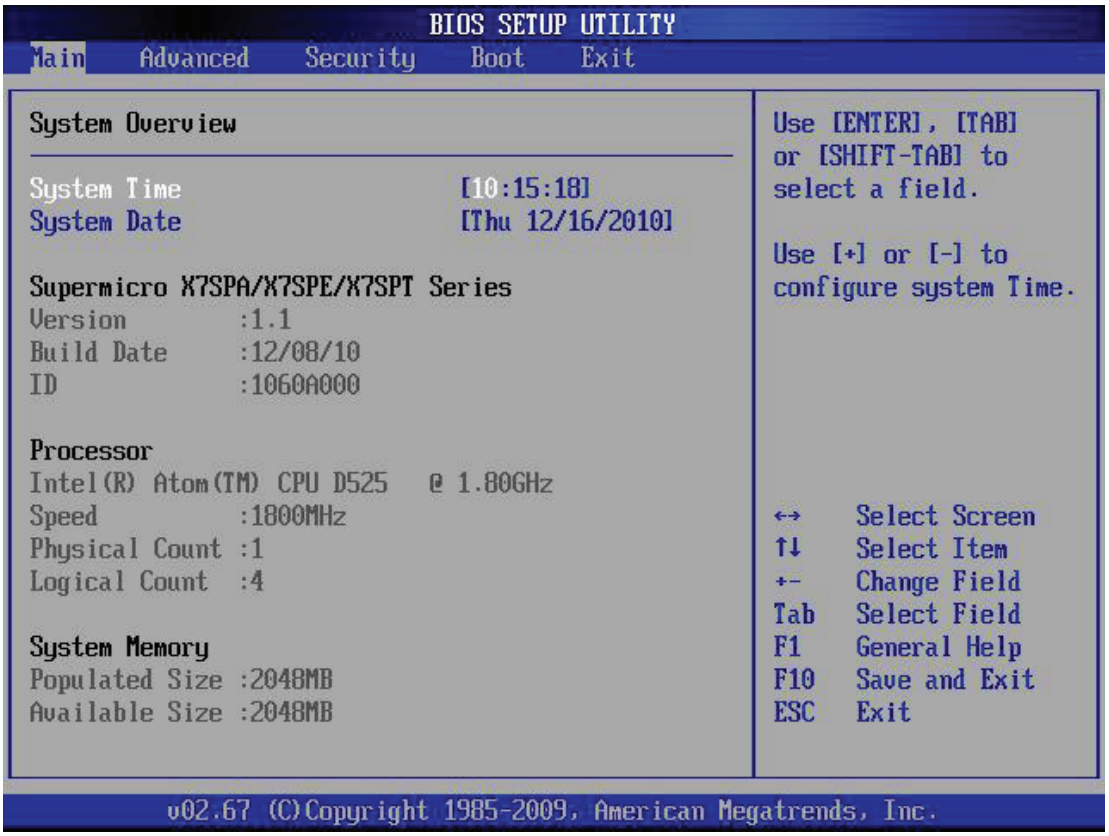
How to Start the Setup Utility

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 X7SPA/X7SPE/X7SPT Series

Version

Build Date

ID

Processor

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

Type of Processor

Speed

Physical Count

Logical Count

System Memory

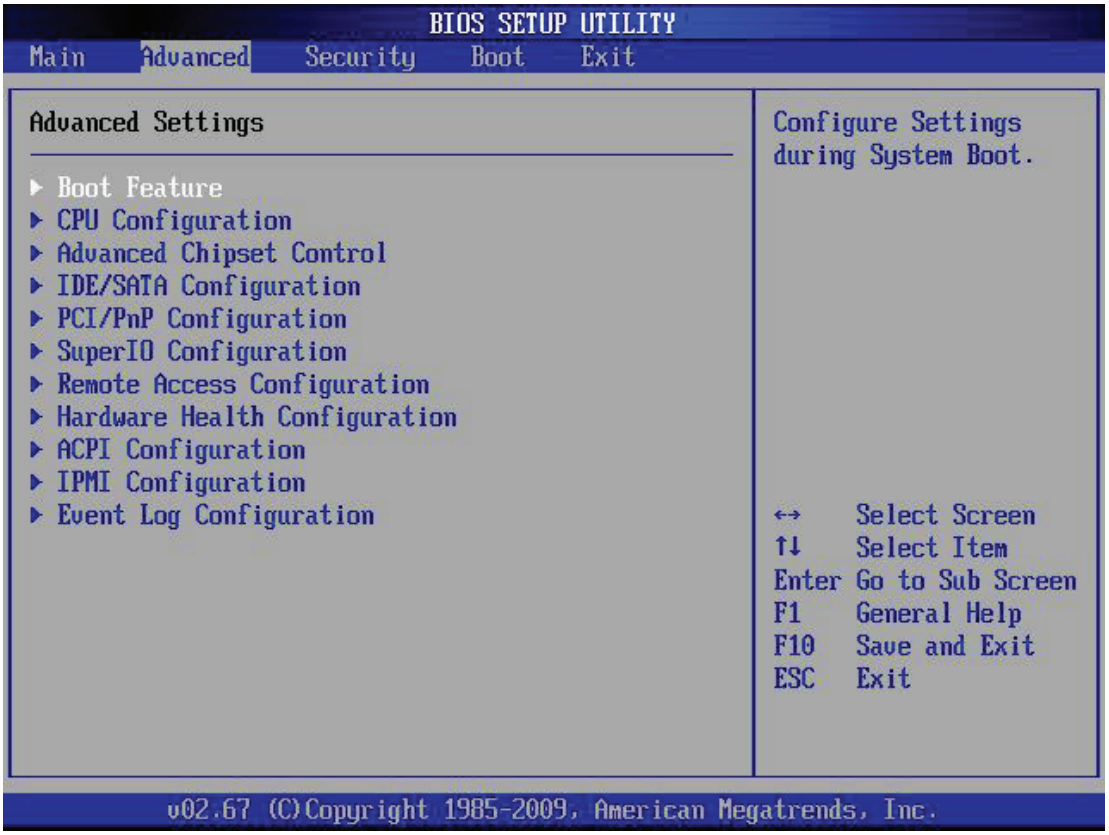
This displays the size of memory available in the system:

Populated Size

Available 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 Function

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.

EUP Support

This feature supplies standby power while in S5 (sleep mode). Set this feature to Disabled to comply with EuP requirements, Enable this feature to activate wake-up capability while in sleep mode. The options are **Enabled** and Disabled.

▶CPU Configuration

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.

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.

Max CPUID Value Limit

This feature allows the user to set the maximum CPU ID value. Enable this function to boot the legacy operating systems that cannot support processors with extended CPUID functions. The options are Enabled and **Disabled** (for the Windows OS.).

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.)

Hyper-threading Technology

This setting allows you to **Enable** or Disable hyper-threading in the CPU. Enabling hyper-threading results in increased CPU performance.

▶Advanced Chipset Control

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

▶Northbridge Configuration

DRAM Frequency

This option allows the user to select the desired frequency setting for the onboard memory modules. The options are **Auto**, 667 MHz and 800 MHz.

Configure DRAM Timing by SPD

This option allows the user to select the desired DRAM timing for the onboard memory modules. The options are **Enabled** and Disabled. The following will appear when Disabled is selected:

DRAM CAS# Latency

The options are [3], [4], **[5]**, and [6]

DRAM RAS# to CAS# Delay

The options are 3 DRAM Clocks, 4 DRAM Clocks, 5 DRAM Clocks, and **6 DRAM Clocks**.

DRAM RAS# Precharge

The options are 3 DRAM Clocks, 4 DRAM Clocks, 5 DRAM Clocks, and **6 DRAM Clocks**.

DRAM RAS# Activate to Precharge

The options are 9 DRAM Clocks, 10 DRAM Clocks, 11 DRAM Clocks, 12 DRAM Clocks**,** 13 DRAM Clocks, 14 DRAM Clocks, and **15 DRAM Clocks.**

Internal Graphics Mode Select

This option selects the amount of system memory used by the onboard graphics adapter. The options are **Enabled, 8MB**.

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, 2 USB ports, 4 USB ports, 6 USB ports, 8 USB ports, 10 USB ports, and **12 USB ports.**

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**.

USB Controller

This feature allows the user to Enable or Disable the onboard USB controller. The options are **Enabled** and Disabled. Note: This function is grayed-out if USB Functions above is set to Enabled.

▶IDE/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#1 as

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

SATA#2 Configuration (Available if 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**.

Primary IDE Master/Slave,
Secondary IDE Master/Slave

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. For Hard disk drives

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 **Enabled**.

ROM Scan Ordering

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

Load Onboard LAN 1 Option ROM/ Load Onboard LAN 2 Option ROM

Select Enabled to load the onboard LAN Option ROM for the LAN port as specified. The options are Enabled and **Disabled**.

Initiate Graphics Adapter

Use this feature to select the graphics controller to be used as the primary boot device. The options are Other, **Onboard VGA** and Slot 6. Select Slot 6 if a graphics controller is installed in the CPU-controlled Slot 6 slot.

▶Super IO Device Configuration

Serial Port1 Address/ Serial Port2 Address

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. 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 Port1 are Disabled, **3F8/IRQ4**, 2E8/IRQ3. The options for Serial Port2 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 decide which serial port to be used for Console Redirection. The options are **COM 1,** COM 2 and COM 3.

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

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.

CPU Temperature

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

System Temperature

This feature displays the absolute system temperature (i.e., 90ºC).

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/FAN2 Speed

This feature displays the fan speed readings from fan interfaces Fan1 (CPU Fan) and Fan2 (System Fan).

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, -12V, 3.3Vsb, and Vbat

This feature displays the voltage readings for the described components.

▶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.

USB Device Wakeup from S3/S4

Select Enable to awaken the system via a USB device when the system is in S3 or S4 sleep State. 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.

Suspend Mode

This setting allows you to configure the ACPI (Advanced Configuration and Power Interface) state for your system when it is in the Suspend mode. The options are **S1**, S3 and Auto.

AMI OEMB Table

Set this value to allow the ACPI BIOS to add a pointer to an OEMB table in the Root System Description Table (RSDT) table. The options are **Enabled**, and Disabled.

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. **Note:** For this particular motherboard, IPMI shares the same network interface with LAN1.

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.

IPMI Function

Set this item to Disabled to turn off the IPMI feature. The options are **Enabled** and Disabled..

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 this 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 Gateway address 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.D0.D4.60)

BMC Watch Dog Timer Action

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

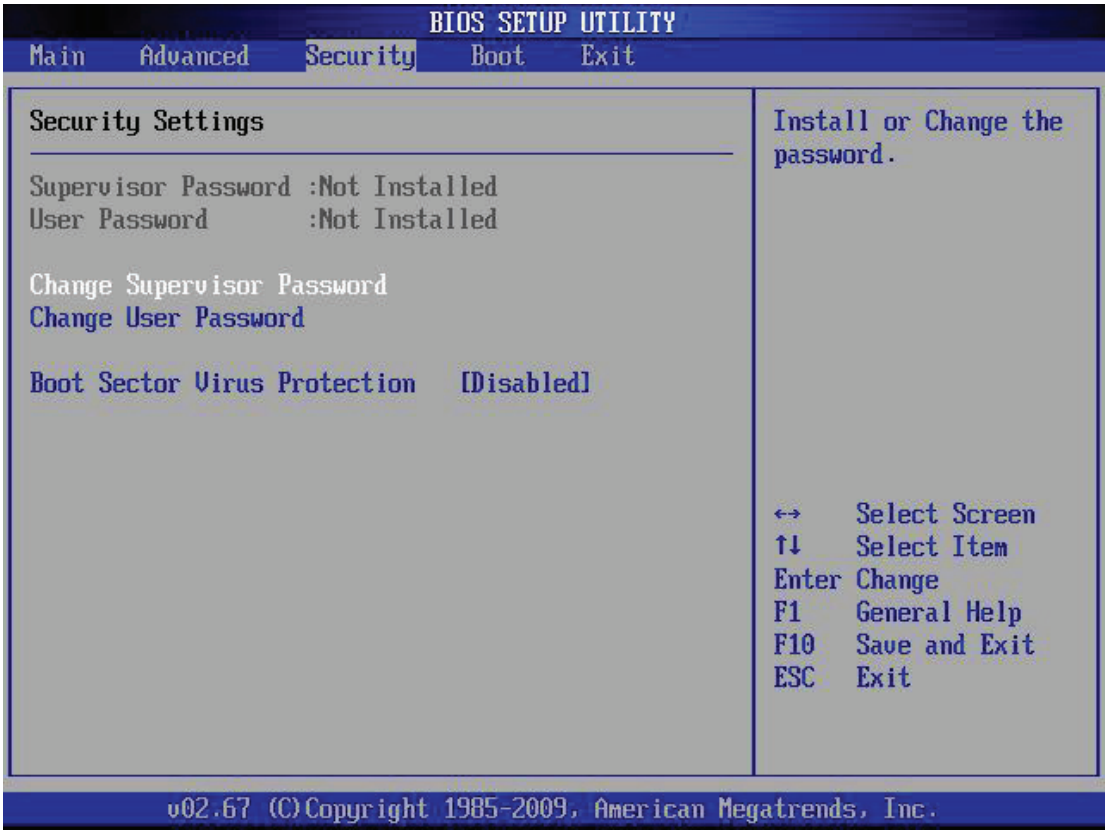
This option marks all events as read. The options are OK and Cancel.

Clear event log

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

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

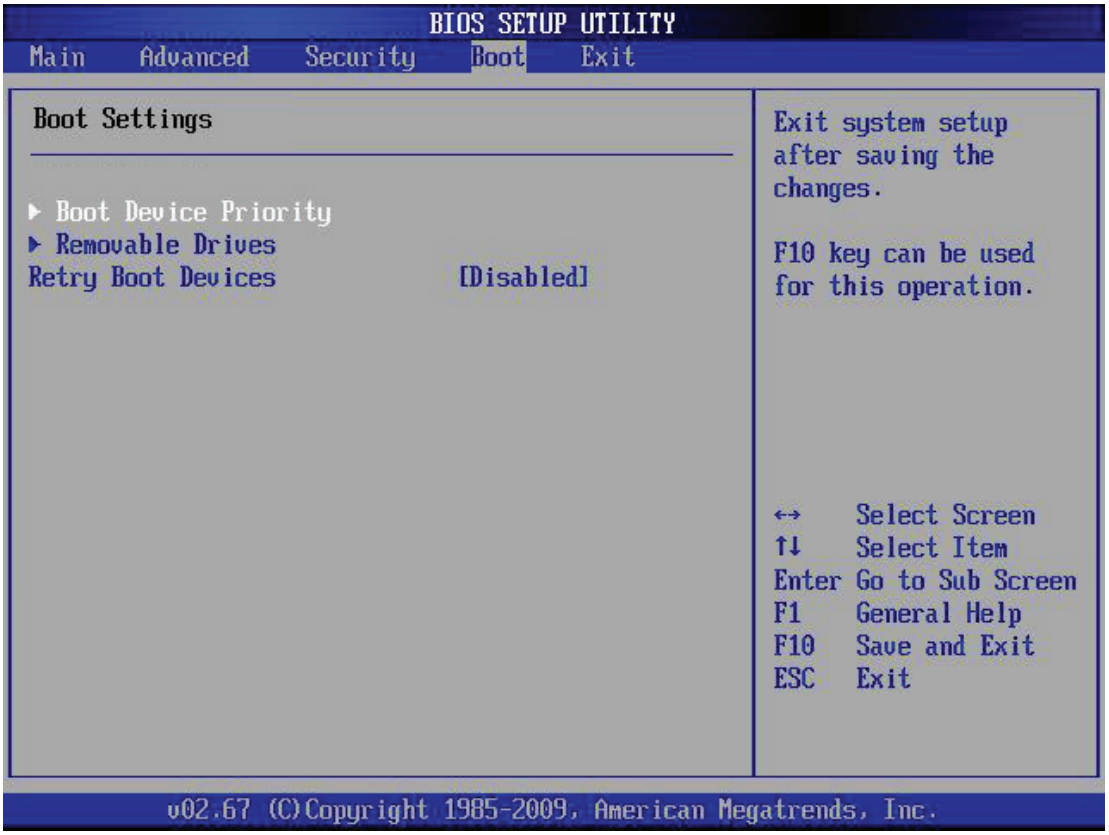
Available options are **Setup** and Always.

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]

▶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

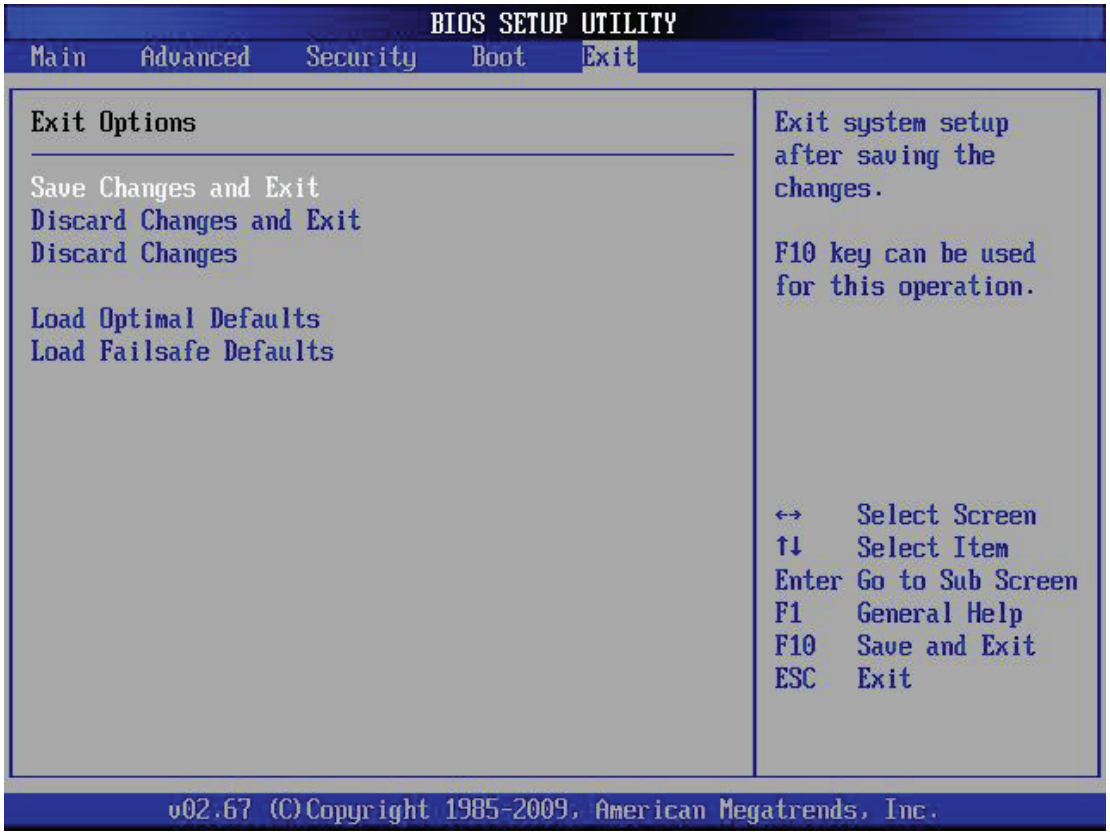
- 2nd Drive - [USB: XXXXXXXXX]

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 con-

figuration 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 two short beeps - video configuration error

1 repetitive long beep - no memory detected

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

8 short beeps - display memory read/write error

Notes

Appendix B

System Specifications

Note: unless noted, serverboard specs apply to a each serverboard (node)

Processors
One Intel® Atom™ D525 1.8 GHz processor (embedded in the motherboard)

Chipset
Intel ATOM D525 + ICH9R chipset

BIOS
8 Mb AMI SPI Flash ROM

Memory Capacity
Two SO-DIMM slots that can support up to 4 GB of unbuffered non-ECC DDR3-800 SO-DIMM memory

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

SATA Drive Bays
Twenty four hot-swap drive bays to house 3.5" SATA drives (three per node)

Motherboard
X7SPT-DF-D525 (mini ITX)
Dimensions: 7.5 x 6.75 in (190.5 x 171.5 mm)

Chassis
SC217HO-R720B (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: 9A - 4A
Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 720W (Part# PWS-721P-1R)
Rated Output Voltages: +12V (59A), +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: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

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

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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