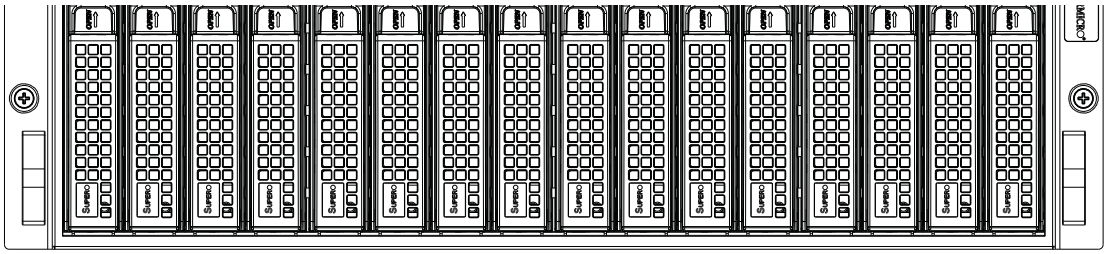
SUPERMICRO®

SUPERSERVER

Super Microcloud™
5037MR-H8TRF



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: June 28, 2012

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 5037MR-H8TRF. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 5037MR-H8TRF is an 8-node, Microcloud™ server system based on the SC938BH-R1K62B 3U chassis and eight X9SRD-F motherboards.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the system and describes the main features of the Super X9SRD-F motherboard and the SC938BH-R1K62B chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the server 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 5037MR-H8TRF.

Chapter 5: Advanced Motherboard Setup

Chapter 5 provides detailed information on the X9SRD-F motherboard, 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 motherboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC938BH-R1K62B 3U server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring 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: BIOS POST Codes

Appendix B: System Specifications

Notes

Table of Contents

Chapter 1

Introduction

1-1 Overview

The SuperServer 5037MR-H8TRF is an eight node, Microcloud™ server system comprised of two main subsystems: the SC938BH-R1K62B 3U chassis and eight X9SRD-F motherboards. Please refer to our web site for information on operating systems that have been certified for use with the 5037MR-H8TRF (www.supermicro.com).

In addition to the motherboard and chassis, various hardware components have been included with the 5037MR-H8TRF, as listed below:

- Four chassis fans (FAN-0133L4)
- One passive heatsink, each node (SNK-P0047PS+)
- One air shroud, each node (MCP-310-93803-0B)
- One riser card, each node (RSC-RR1U-E8)
- SATA Accessories
  One SATA backplane (BPN-SAS-938H)
  Sixteen hot-swap hard drive carriers (MCP-220-00094-0B)
- One rail kit (MCP-290-00053-0N)

1-2 Motherboard Features

The 5037MR-H8TRF includes a total of eight X9SRD-F single processor motherboards, which are based on the Intel C602J PCH chipset. Below are the main features of the X9SRD-F. (See Figure 1-1 for a block diagram of the chipset).

Processors

Each X9SRD-F supports a single Intel E5-2600 Series processor in an LGA 2011 socket. Please refer to the motherboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X9SRD-F has four DIMM slots that can support up to 128 GB of ECC LV/LR/R/UDIMM DDR3-1600/1333/1066/800 memory. This equates to a maximum of 1024 GB for the system. Memory modules of the same size and speed should be used. See Chapter 5 for details.

SATA

A SATA controller is integrated into the chipset to provide a six-port SATA subsystem. Two of these are for SATA 3.0 (ports SATA0/1) and the rest support SATA 2.0. The SATA drives are hot-swappable units.

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

Rear I/O Ports

The rear I/O panel includes one KVM connector, an IPMI port, a power LED and buttons for UID (Unit Identification) and power.

Graphics

There is no onboard graphics controller on the X9SRD-F. A VGA port is included on the KVM connector.

IPMI

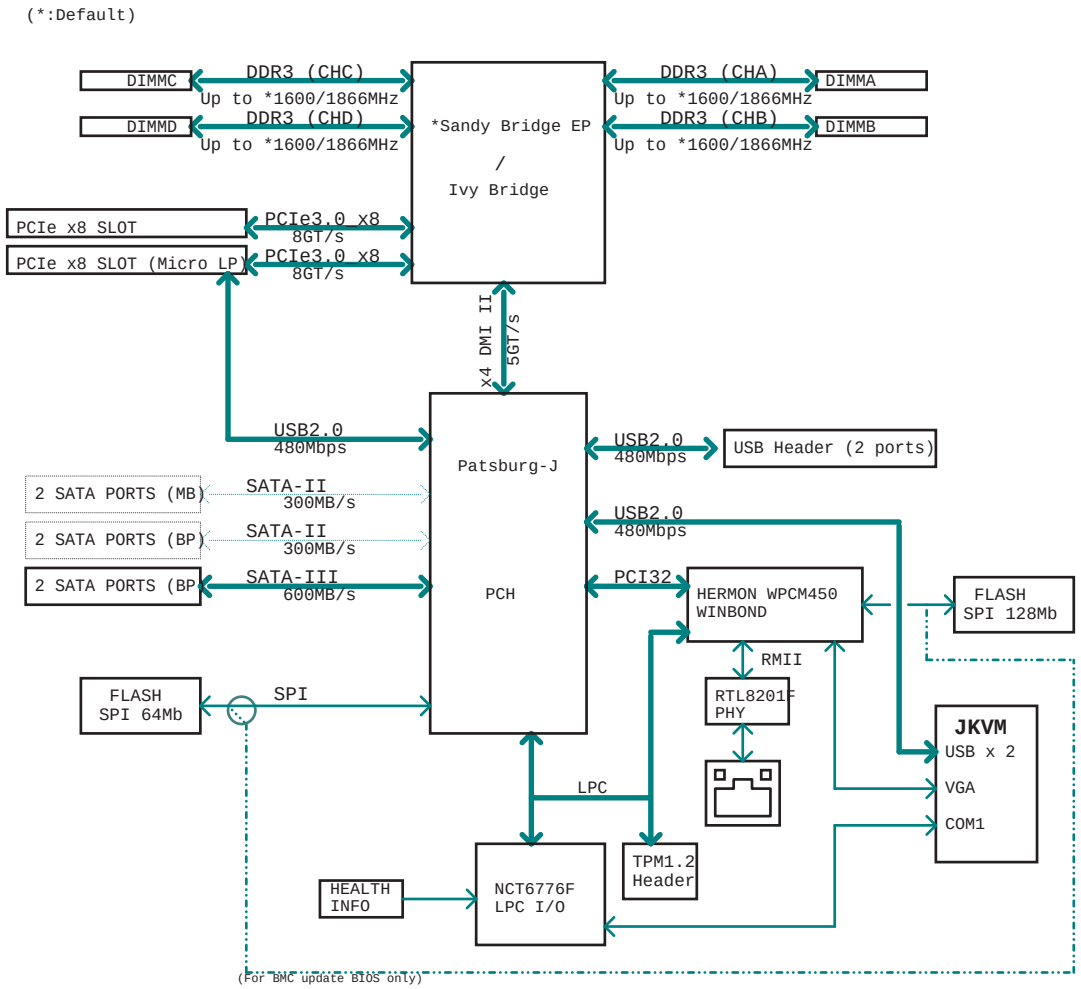
IPMI (Intelligent Platform Management Interface) is a hardware-level interface specification that provides remote access, monitoring and administration for Supermicro server platforms. IPMI allows server administrators to view a server's hardware status remotely, receive an alarm automatically if a failure occurs, and power cycle a system that is non-responsive.

Other Features

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

Figure 1-1. Intel C602J Chipset: System Block Diagram

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



1-3 Server Chassis Features

The following is a general outline of the main features of the SC938BH-R1K62B server chassis.

System Power

The SC938BH-R1K62B features a redundant (two separate power modules) 1620W high-efficiency power supply. This power redundancy feature allows you to replace a failed power supply without shutting down the system.

Front Control Panel

The control panel on the 5037MR-H8TRF features a power button/LED, a power fail LED and eight LEDs to indicate the status of each node in the system.

Cooling System

The SC938BH-R1K62B chassis includes four 8-cm fans located behind the backplane. Each fan is associated with and controlled by two nodes. Each node also has an air shroud to channel the airflow from the system fans to efficiently cool the components that generate the most heat. See Chapter 6 for details.

1-4 Contacting Supermicro

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Technical Support:	
Email:	support@supermicro.com.tw
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Notes

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your 5037MR-H8TRF 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 motherboard, 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 5037MR-H8TRF 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 5037MR-H8TRF. 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 5037MR-H8TRF may have come with hardware to mount the system into a server rack. If mounting to a rack with the rail kit, 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) and 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 acccording 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 SATA 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.

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.).

2-4 Installing the System into a Rack

This section provides information on installing the chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean that the assembly procedure will differ slightly from the instructions provided. 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 26.5" and 36.4" deep.

Identifying the Sections of the Rack Rails

The chassis package includes two rail assemblies in the rack mounting kit. Each assembly consists of three sections: An inner chassis rail that secures directly to the chassis, an outer rail that secures to the rack, and a middle rail, which extends from the outer rail. These assemblies are specifically designed for the left and right side of the chassis.

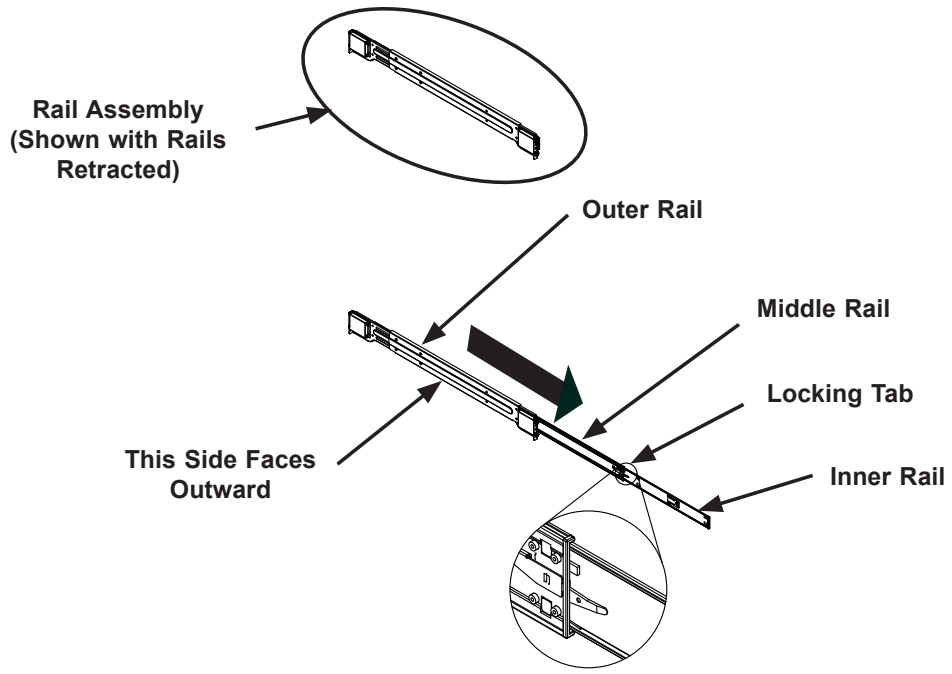


Figure 2-1. Identifying the Outer, Middle and Inner Rails (Left Rail Assembly Shown)

Locking Tabs

Each inner rail has a locking tab. This tab locks the chassis into place when installed and pushed fully into the rack. These tabs also lock the chassis in place when fully extended from the rack. This prevents the server from coming completely out of the rack when when the chassis is pulled out for servicing.

Releasing the Inner Rail

Releasing Inner Rail from the Outer Rails

1. Identify the left and right outer rail assemblies as described on the previous page.
2. Pull the inner rail out of the outer rail until it is fully extended as illustrated below.
3. Press the locking tab down to release the inner rail.
4. Repeat steps 1-3 for the remaining outer rail.

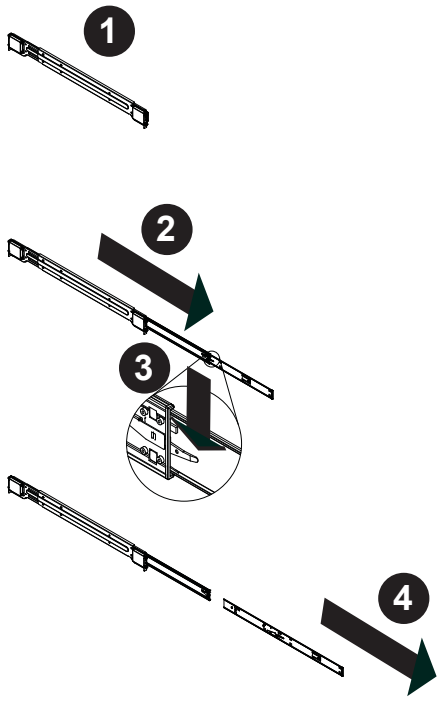


Figure 2-2. Extending and Releasing the Inner Rail

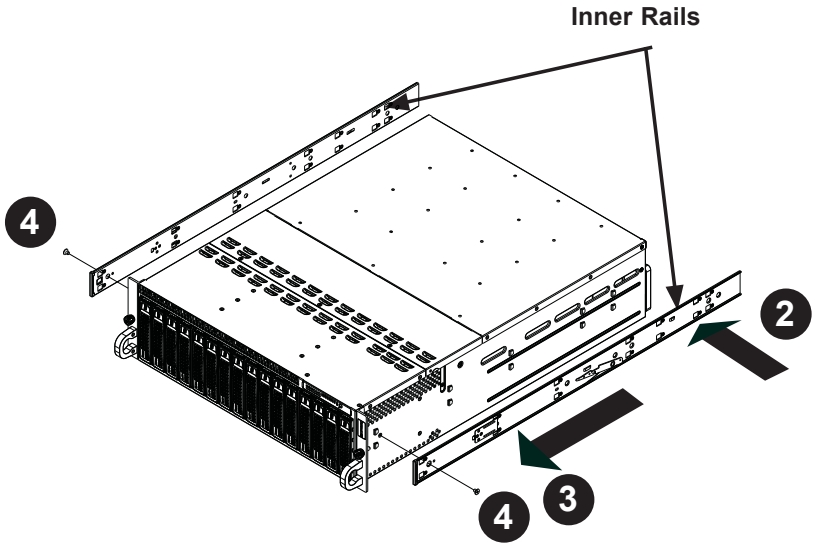


Figure 2-3. Installing the Inner Rails

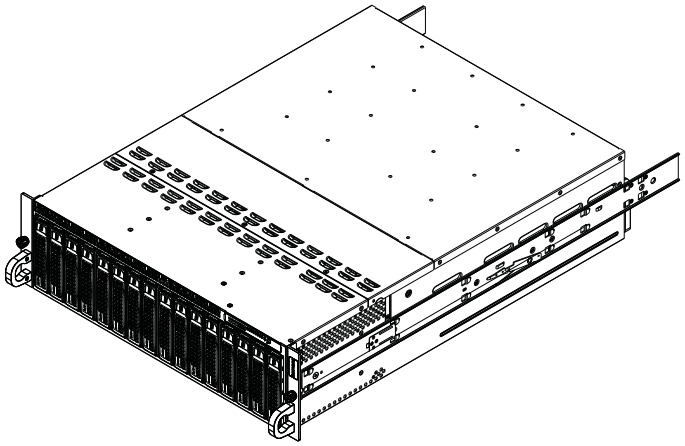


Figure 2-4. Inner Rails Installed on the Chassis

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.

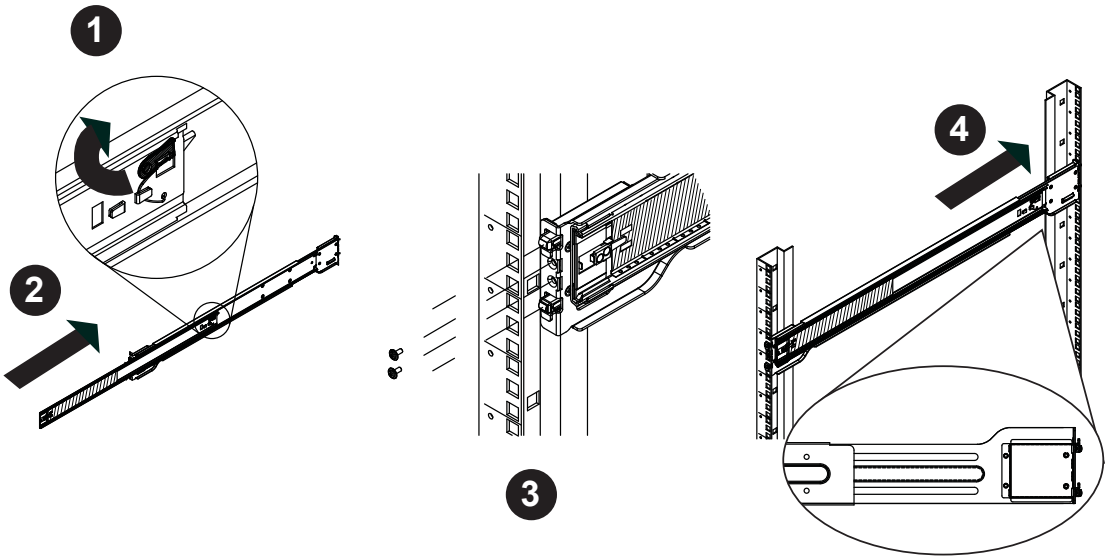


Figure 2-5. Extending and Releasing the Outer Rails

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.

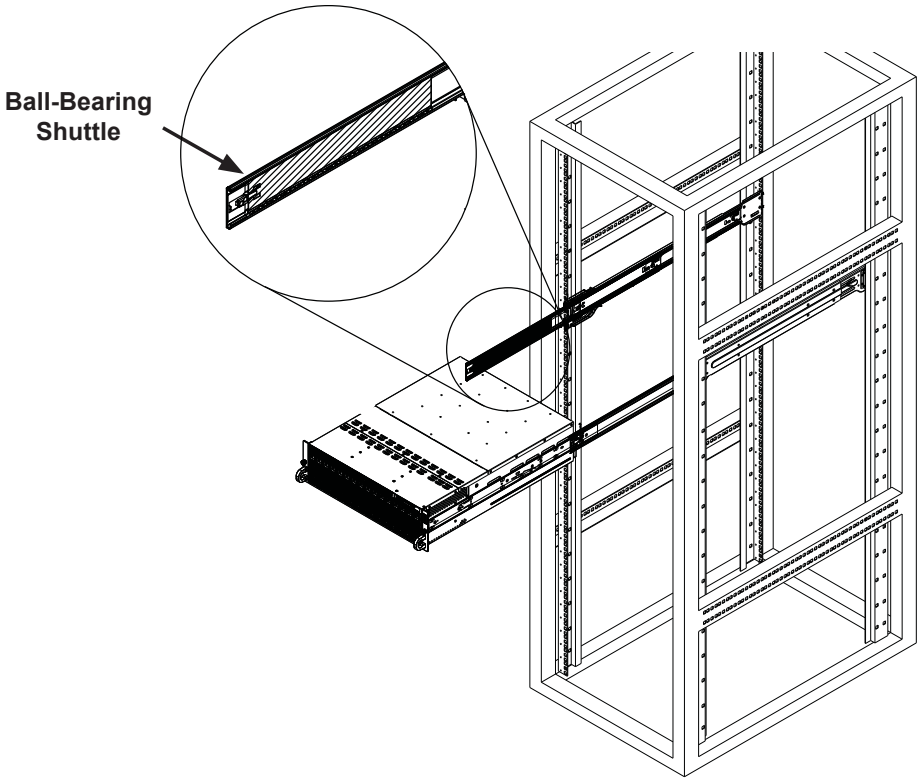


Figure 2-6. Installing the Chassis into a Rack

Standard Chassis Installation

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.

Optional Quick Installation Method

The following quick installation method may be used to install the chassis onto a rack.

1. Install the inner rails on the chassis as previously described on page 2-6.
2. Install the whole rail assembly onto the rack as described on page 2-7.
3. Release the inner rail without retracting the middle rail.
4. Install the chassis onto the middle rail as described in the previous section.

Note that these figures are for illustrative purposes only. Servers should always be installed to racks from the bottom up.

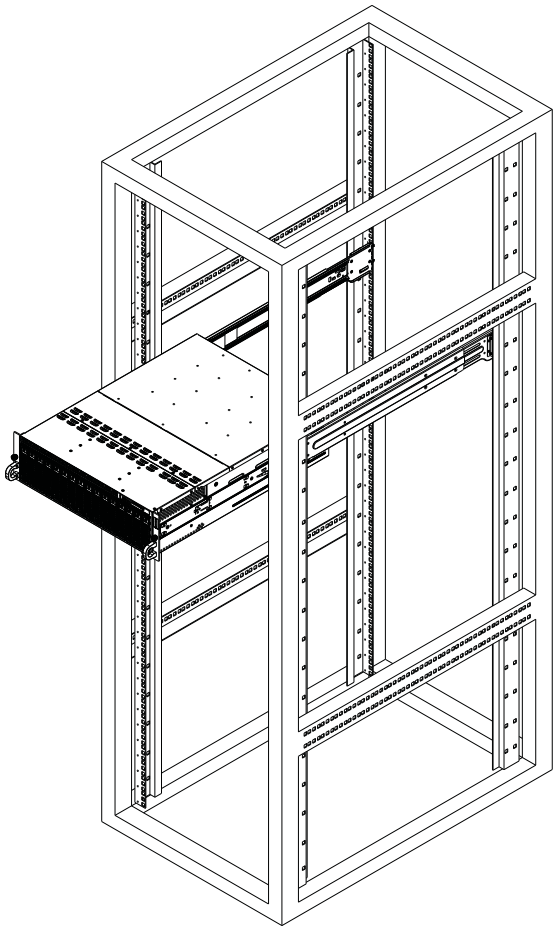


Figure 2-7. Installing the Chassis into a Rack

2-5 Checking the Motherboard Setup

After setting up the the system, you may need to open the unit to make sure all the connections have been made.

Note: Before operating the system for the first time, it is important to remove the protective film covering the ventilation openings on the top of the chassis. These vents provide proper ventilation and cooling for the system.

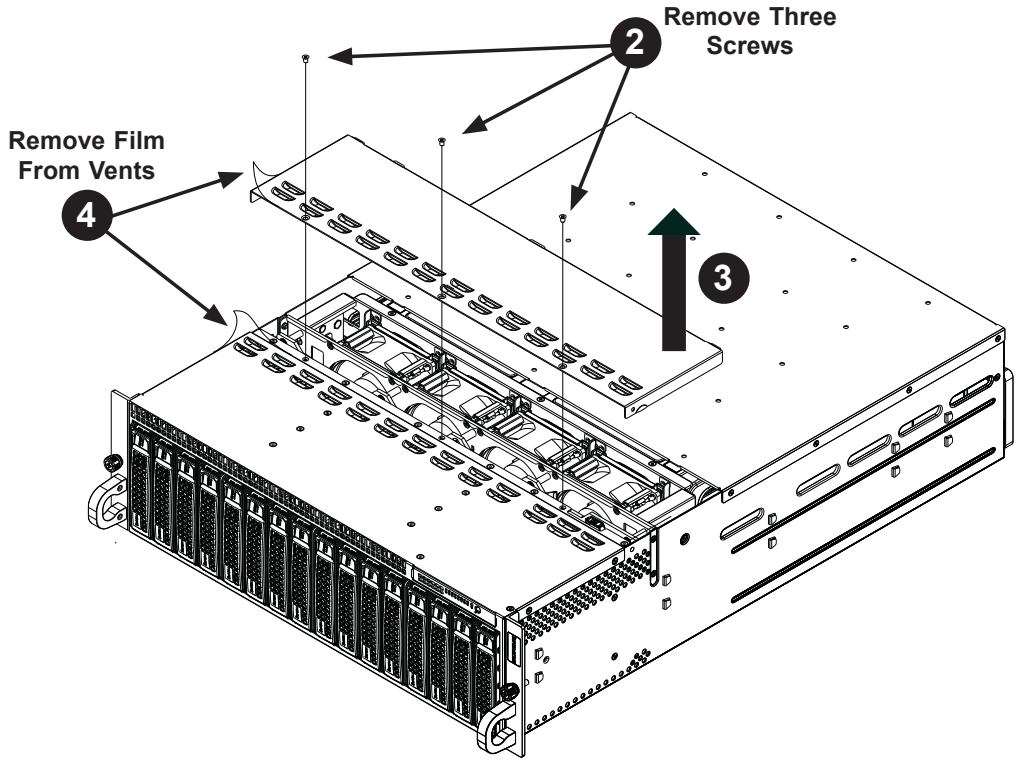
Removing the Chassis Cover and Protective Film

1. Disconnect the chassis from any power source.
2. Remove the three screws that secure the top cover onto the chassis as illustrated in Figure 2-8.
3. Lift the top cover up and off the chassis.
4. Peel off the protective film covering the top cover and the top of the chassis
5. Check that all ventilation openings on the top cover and the top of the chassis are clear and unobstructed.

Checking the Components and Setup

1. You may have a processor already installed into each of the motherboards. Each processor should have its own heatsink attached. See Chapter 5 for instructions on processor and heatsink installation.
2. Your server 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. If desired, you can install add-on cards to the system. 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.

Figure 2-8. Accessing the Inside of the System



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.

2-6 Preparing to Power On

Checking the Drives

1. Depending upon your system's configuration, your system may have hard 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 hot-swap system fans working in conjunction with air shrouds on each node. The system component layout was carefully designed to promote sufficient airflow through the chassis.

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. Keep this in mind when you reroute them after working on the system.

Providing Power

1. Plug the AC power cords 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.

Warning: Except for short periods of time while swapping nodes, do not operate the server with the node bays empty. In the unlikely event of a node failure, remove the failed node and replace it with the dummy node that was included with the system..

Chapter 3

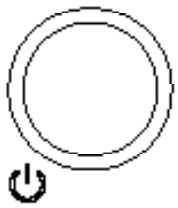
System Interface

3-1 Overview

LEDs are included on the control panel, the serverboard nodes and on the drive carriers to keep you constantly informed of the overall status of the system. The SC938 features four separate control panels on the handles of the chassis to control the nodes.

This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

3-2 Control Panel Buttons



Power Button/LED

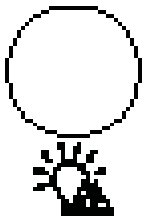
The main power button on the control panel functions as both an on/off switch and as an LED. The LED illuminates green when powered-on and is not illuminated when powered-off.

- A quick press of less than five seconds will sequentially power-on all of the nodes in order from one to eight.
- Pressing the button for longer than five seconds will sequentially power-down the nodes in order from one to eight.

Turning off system power with this button removes the main power, but keeps standby power supplied to the system. Therefore, you must completely unplug system from any power source before servicing the chassis. This does not apply to hot-swappable hard drives, serverboard nodes and system fans.

3-3 LEDs

Power Failure LED



This red LED is illuminated only when a power failure occurs. The LED will illuminate when any node is powered-on and one of the power supplies fails. This LED is off during normal operation.

Node Status LEDs

The SC938 control panel features eight numbered node status LEDs, which indicate the status of each serverboard node.

Figure 3-1. Node Status LEDs

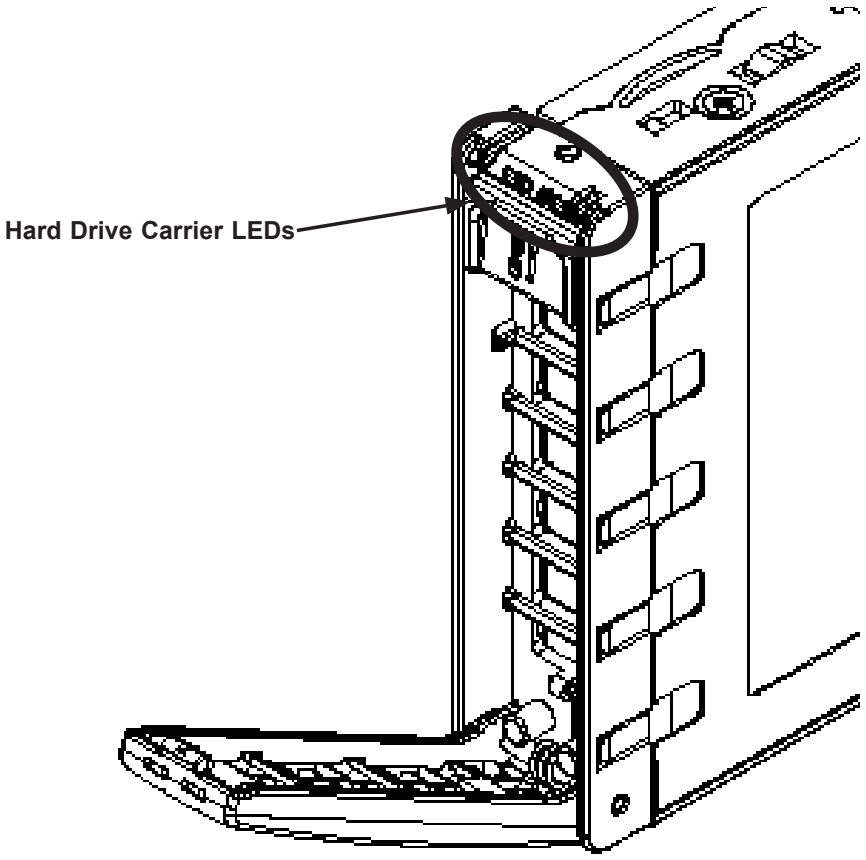
LED Appearance	Description
Solid Green	The node is powered on and operating normally
Blinking Green	The node is in the process of shutting down
Solid Red	The node is detecting an overheated condition
1Hz Blinking Red	The node is detecting a fan failure
.25Hz Blinking Red	The node is detecting a power failure
Solid Blue	The node local UID is on
1Hz Blinking Blue	The node remote UID is on
No Illumination	The node is powered-down

3-4 Hard Drive Carrier LEDs

The hard drives ued in the SC938 chassis are installed in drive carriers. Each drive carrier has two LEDs located on the front of the carrier.

- Green: Each drive carrier has a green LED. When illuminated, this LED indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.
- Red: Indicates a drive failure. If one of the drives fail, you should also be notified by your system management software.

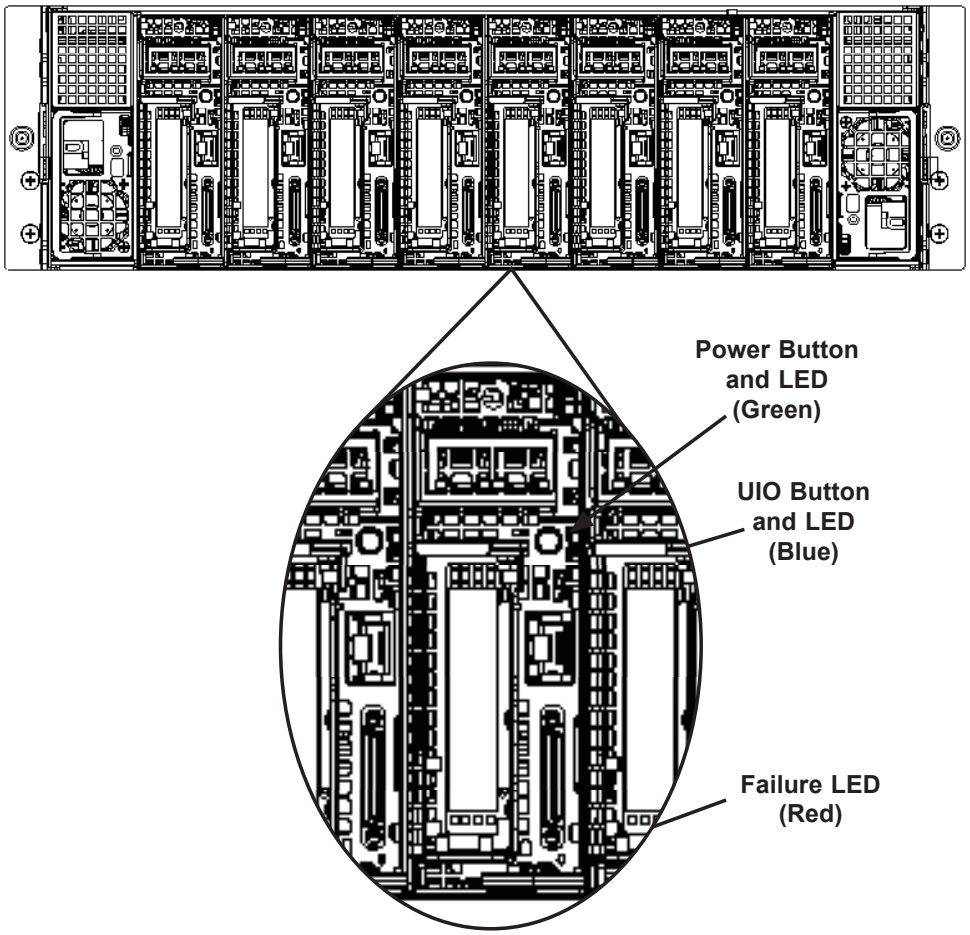
Figure 3-2. Hard Drive Carrier LEDs



3-5 Node LEDs

Individual LEDS are located on the back of each serverboard node on the rear of the chassis.

Figure 3-3. Rear Node LED Indicators



Power Button and LED

This button will power on the node individually. It is illuminated green when the node is powered on, it is off (unilluminated) when the node is powered off.

UIO Button and LED

This button is used to identify the node within the system. It is illuminated blue when activated, it is off when inactive.

Failure LED

This LED is illuminated red when a failure has occurred and off during normal operation. If illuminated, check that the two corresponding hard drives are fully inserted into their bays with their handles completely pushed in. Check also that the fan is operating properly and that the node is fully inserted into its bay.

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 5037MR-H8TRF 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 motherboard, memory modules and floppy drive. When disconnecting power, you should first power down the system with the operating system first and then unplug the power cords of all the power supply units in the system.

- 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 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.

- Motherboard 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 SuperServer 5037MR-H8TRF clean and free of clutter.

- The SuperServer 5037MR-H8TRF weighs approximately 62.2 lbs. (28.3 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 and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

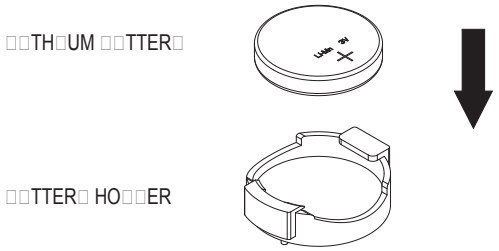
Electrostatic Discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient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

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 5037MR-H8TRF is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

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 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 server 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

The X9SRD-F motherboards have been preinstalled into carriers to simplify installing and removing the nodes from the SC938H-R1620B chassis. The motherboards should remain in these carriers at all times. If a failed node needs to be returned for repair or replacement, the motherboard is to be shipped assebled in its carrier and not by itself. See Chapter 6 for instructions on installing and removing the motherboard nodes from the chassis.

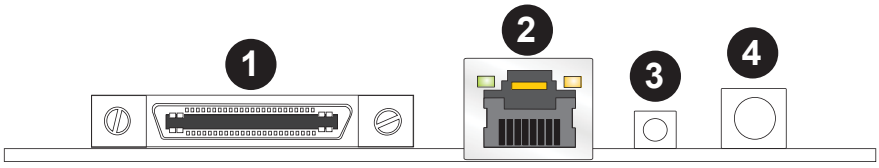
5-3 Connecting Cables

The 5037MR-H8TRF server was designed as a cableless system. As a result, all power and data connections to the motherboard nodes are made whenever a node is installed into its bay in the chassis. This covers the main power connection, the control panel connections and the data and power connections for the SATA drives.

5-4 I/O Ports

The I/O ports are located at the back of the motherboard node. See Figure 5-1 below for the colors and locations of the various I/O ports.

Figure 5-1. I/O Ports



I/O Ports			
1	KVM Port	3	UID Button
2	IPMI Port	4	Power Button and LED

5-5 Installing the Processor and Heatsink

Caution: Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

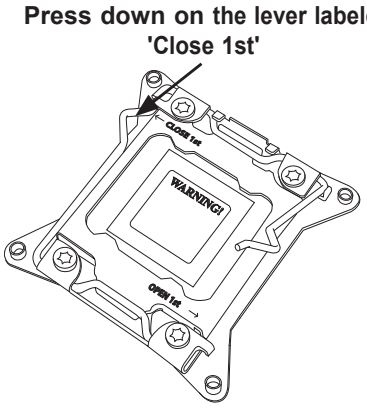
Notes:

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

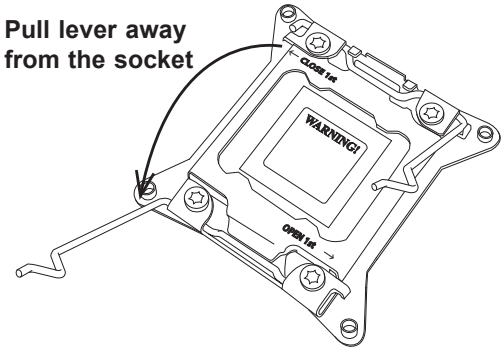
Installing an LGA 2011 Processor

Follow the procedure below to install a CPU.

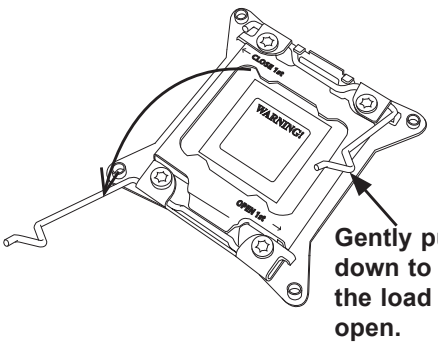
1. There are two levers on the LGA 2011 socket. First press and release the load lever labeled 'Open 1st'.



2. Press the second load lever labeled 'Close 1st' to release the load plate from its locked position.

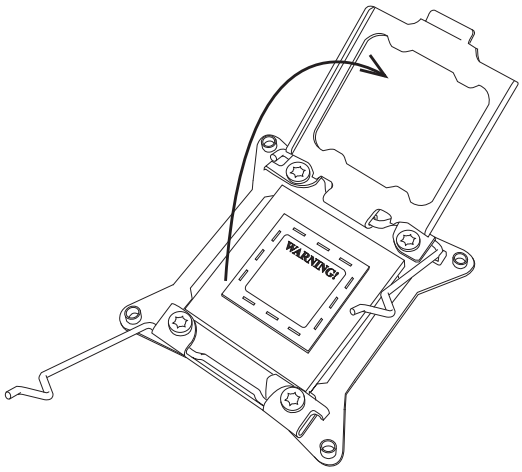


3. With the lever labeled 'Close 1st' fully retracted, gently push down on the 'Open 1st' lever to open the load plate. Lift the load plate to open it completely.

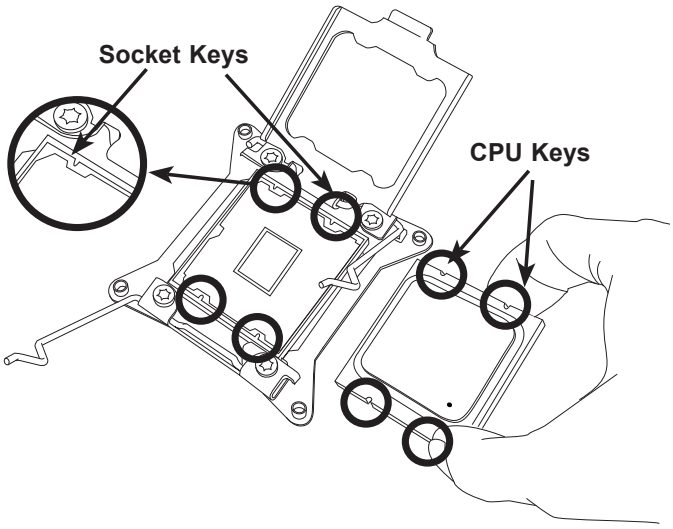


4. Using your thumb and the index finger, remove the 'WARNING' plastic cap from the socket.

5. Use your thumb and index finger to hold the CPU by its edges. Align the CPU keys, which are semi-circle cutouts, against the socket keys.



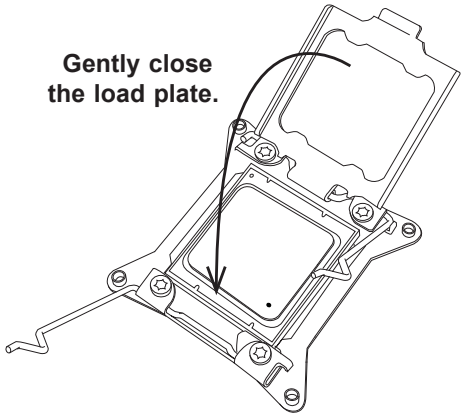
6. Once they are aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically and do not rub the CPU against any pins of the socket, which may damage the CPU or the socket.)

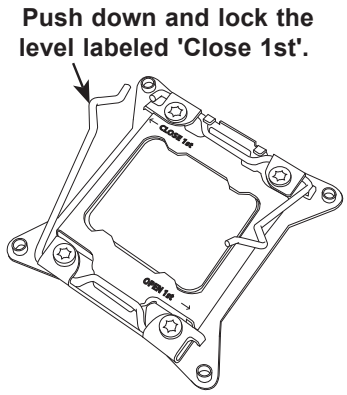


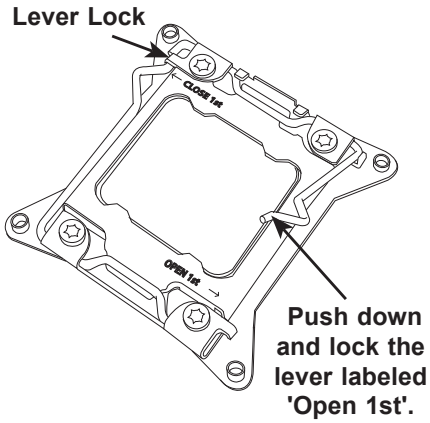
Caution: You can only install the CPU to the socket in one direction. Make sure that the CPU is properly inserted into the socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is aligned properly.

7. With the CPU in the socket, inspect the four corners of the CPU to make sure that they are flush with the socket.

8. Close the load plate. Lock the lever labeled 'Close 1st', then lock the lever labeled 'Open 1st'. Use your thumb to gently push the load levers down until the lever locks.







Installing a CPU Heatsink

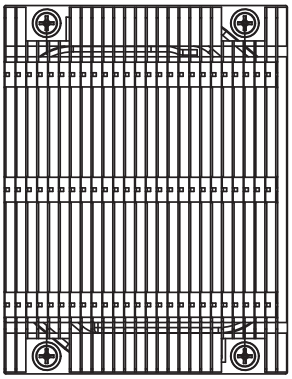
1. Remove power from the system and unplug the AC power cord from the power supply.

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

3. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the (preinstalled) heatsink retention mechanism.

4. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug. Do not fully tighten the screws or you may damage the CPU.)

5. Add the two remaining screws then finish the installation by fully tightening all four screws.



Removing the Heatsink

1. Unscrew and remove the heatsink screws from the motherboard in the sequence as show in the picture above.

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

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

4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before you re-install a heatsink.

Note: see Chapter 6 for details on installing the air shroud.

5-6 Installing Memory

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

How to Install Memory

1. Insert the desired number of DIMMs into the memory slots, starting with DIMMA1, then DIMMB1, DIMMC1, DIMMD1. Pay attention to the notch along the bottom of the module to prevent incorrect installation.

2. Insert each DIMM module vertically push down until it and snaps into place. Repeat to install more memory, if needed. See instructions on the next page.

Memory Support

Each X9SRD-F supports up to 128GB of unbuffered DDR3 ECC LV/LR/R/UDIMM 1333/1600 MHz in 4 DIMM slots.. Please refer to the product page on our web site for possible updates to memory support.

Figure 5-2. Installing and Removing DIMMs

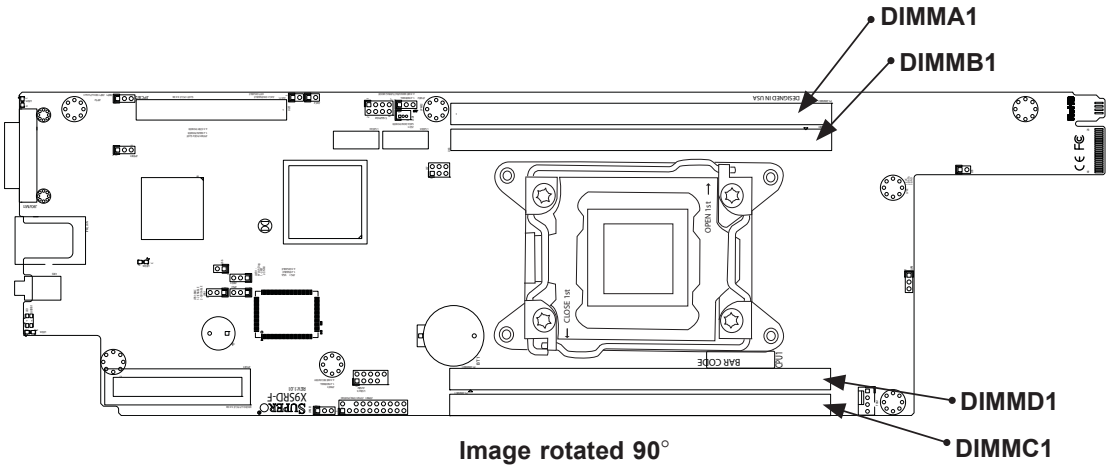
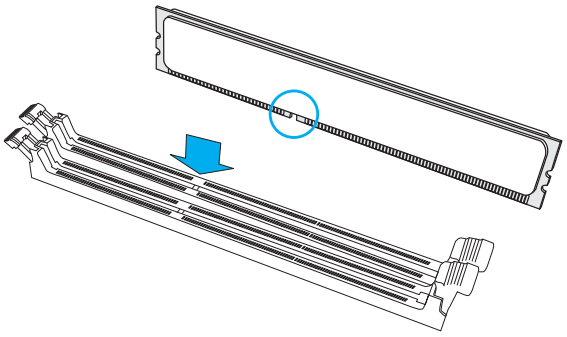


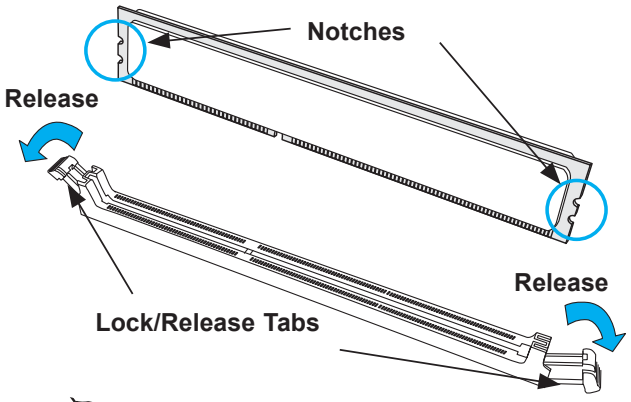
Image rotated 90°

Installing and Removing DIMMs

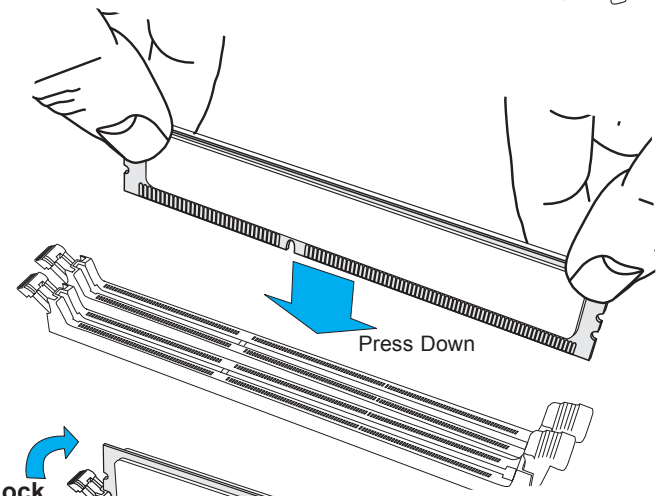
Position the DIMM module's bottom key so that it aligns with the receptive point on the slot.



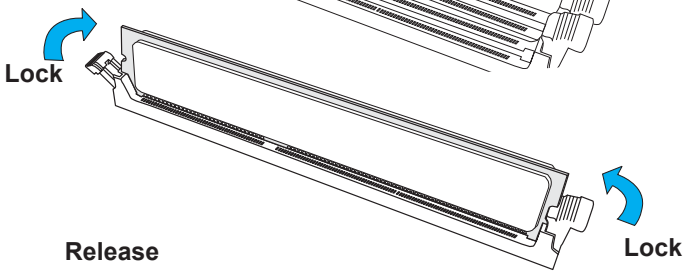
Push a lock/release tab to the release position. Make sure that the side notches of the DIMM module aligns with the lock/release tab of the slot as it is pressed in.



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

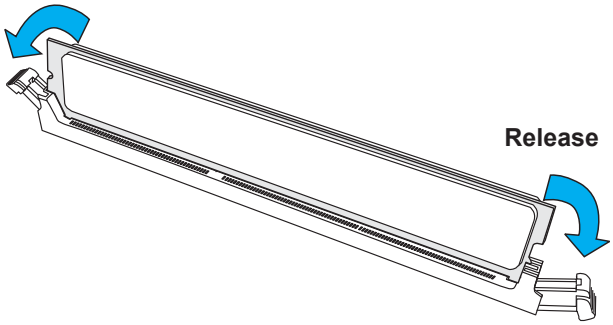


When the module is properlly inserted, the lock/release tabs will automatically secure the DIMM module, locking it into place.



To Remove:

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



Memory Population Guidelines

When installing memory modules, the DIMM slots should be populated in the following order: DIMMA1, DIMMB1, DIMMC1 and DIMMD1.

- Always use DDR3 DIMM modules of the same size, type and speed.
- Mixed DIMM speeds can be installed. However, all DIMMs will run at the speed of the slowest DIMM.
- The motherboard will support one or three DIMM modules installed. For best memory performance, install DIMM modules in pairs.

Recommended Population (Balanced)				
DIMMA1 Slot	**DIMMB1 Slot**	**DIMMC1 Slot**	**DIMMD1 Slot**	**Total System Memory**
2GB	2GB			4GB
2GB	2GB	2GB	2GB	8GB
4GB	4GB			8GB
4GB	4GB	4GB	4GB	16GB
8GB	8GB			16GB
8GB	8GB	8GB	8GB	32GB
16GB	16GB			32GB
16GB	16GB	16GB	16GB	64GB
32GB	32GB			64GB
32GB	32GB	32GB	32GB	128GB

5-7 Adding PCI Add-On Cards

The 5037MR-H8TRF supports one low-profile PCI card in each of the eight nodes. To install an expansion card, follow the instructions below.

Installing an Add-on Card

1. Power-down the node using that node's individual power button and remove it as described in Chapter 6.
2. Open the PCI slot clip and remove the PCI slot shield.
3. Open the PCI slot clip in the rear of the motherboard node.
4. Remove the PCI slot shield.
5. Insert the expansion card into the riser card which is pre-installed on the motherboard (if desired the riser card may be removed from the motherboard by removing the riser card screw)

6. Slide the expansion cards bracket into the PCI card slot and fit it with the opening in the rear of the node.

7. Close the PCI card slot clip to secure the expansion card.

Note: The PCI slot shields protect the motherboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused slot.

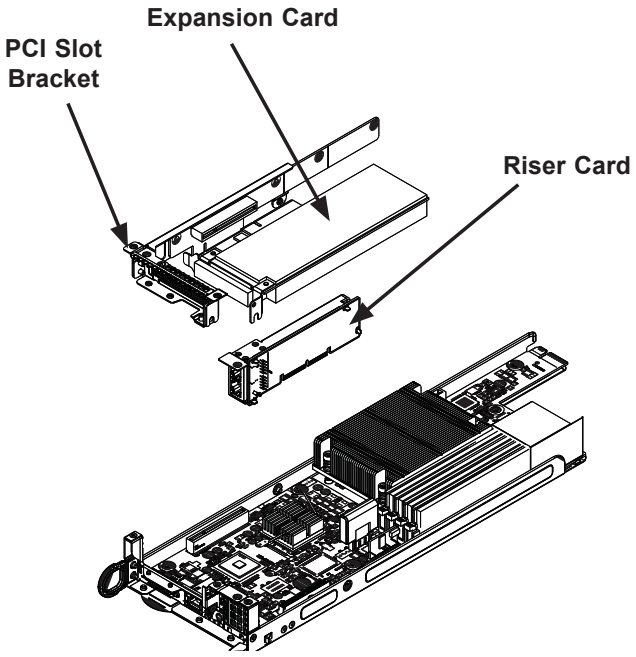
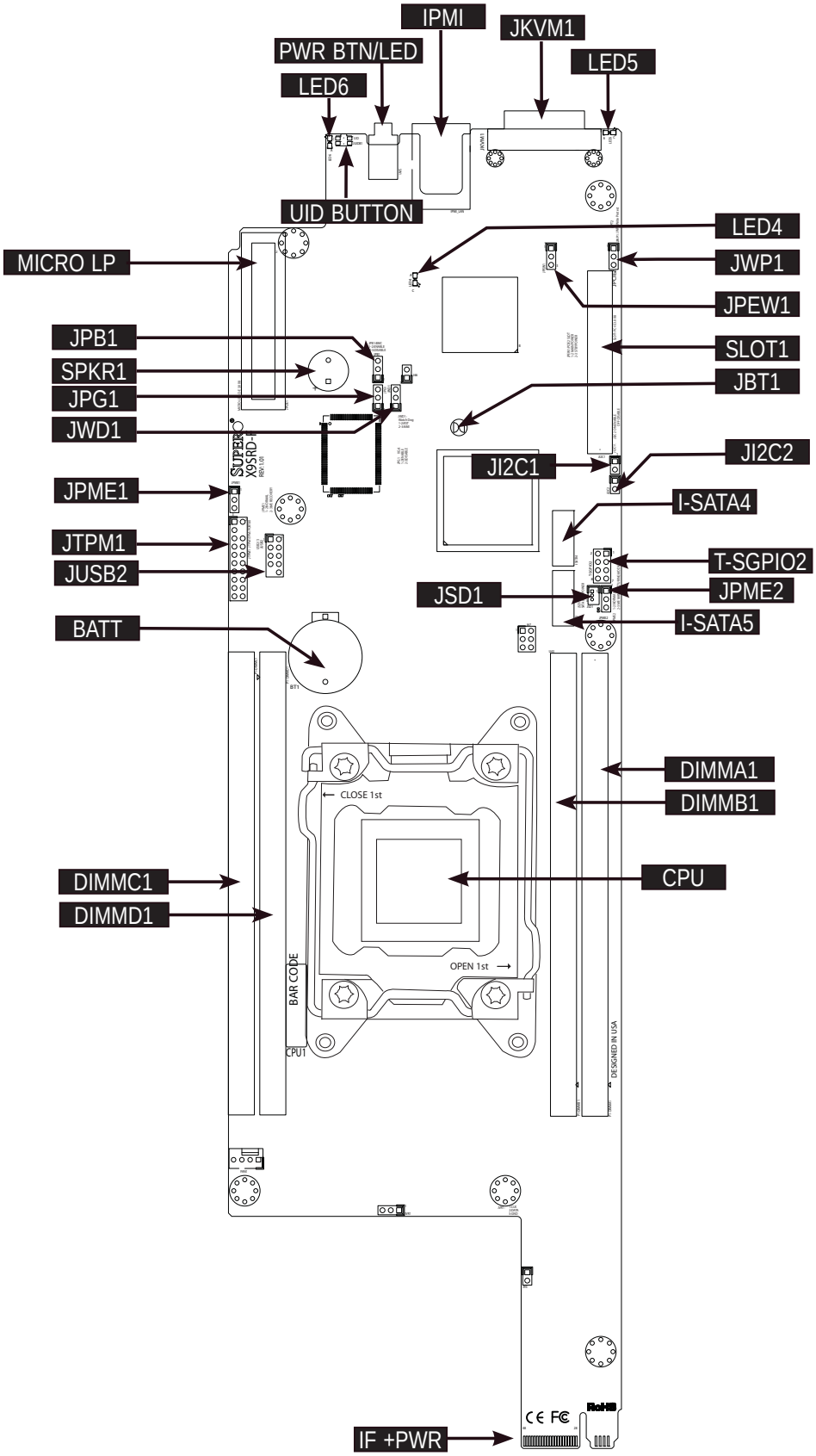


Figure 5-3: Installing an Expanion Card

Note: The node and motherboard shown above are examples. Your actual node and motherboard may vary from those illustrated.

5-8 Motherboard Details

Figure 5-4. X9SRD-F Layout



X9SRD-F Quick Reference

MICRO LP SLOT	PCI-E (Micro LP Slot)
SPKR1	Internal Speaker / Buzzer
JTPM1	Trusted Platform Module (TPM) Header
JUSB2	USB Header (USB 2/3)
I-SATA4 / I-SATA5	Internal SATA Ports
JSD1	SATA Disk On Module (DOM) Power Connector
T-SGPIO2	Serial Link General Purpose Header
DIMMA1~DIMMD1	DIMM Memory Slots
IF + PWR	Back Panel Edge Connector (SATA/Power)
BATT	Onboard Battery
SLOT1	PCI-E 3.0 x 8 Slot
LED4	IPMI Heartbeat (Green: Blinking = Normal)
LED5	System/Fan Fail LED
JKVM1	USB / VGA / UART Interface
IPMI	RJ45 IPMI Port
LED6	Unit ID LED
UID BUTTON	Unit ID Button
PWR BTN/LED	Power Button and LED

Jumper	Description	Default Setting
JPB1	BMC Enable/Disable	Pins 1-2 (Enabled)
JPG1	Onboard VGA Enable/Disable	Pins 1-2 (Enabled)
JWD1	Watch Dog Timer RST/NMI Selection	Pins 1-2 (Reset)
JPME1	ME Recovery Mode Select	Pins 2-3 (Disabled)
JPME2	ME Manufacture Mode	Pins 2-3 (Disabled)
JPWP1	BIOS Write Protect	Pins 1-2 (Enabled)
JPEW1	PCI-E Vaux Select	Pins 1-2 (Normal, 3.3V Power Plane)
JBT1	CMOS Clear	See Section 5-11
JI2C1, JI2C2	SMB to PCI Slots	See Section 5-11

5-9 Connector Definitions

IF + POWER

This edge connector, located on the opposite end of the motherboard from the I/O back panel, is used to connect the motherboard to the backplane of the server chassis. Through this connector, the motherboard will receive its power and communicate with the rest of the system (hard drives, warning lamps, etc).

TPM Header

This header is used to connect a Trusted Platform Module (TPM), which is available 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

T-SGPIO (T-SGPIO2)

One T-SGPIO (Serial-Link General Purpose Input/Output) header is supported on the motherboard. This header is used to communicate with the enclosure management chip in the system. See the table on the right for pin definitions. Refer to the board layout below for the location of the header.

Serial_Link-SGPIO Pin Definitions

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

Universal Serial Bus (USB)

Two Universal Serial Bus ports (USB 2~3) are located on the on the motherboard. These are available on a header. There are also two ports (USB 0/1) available through the KVM port (Cables are not included). See the table on the right for pin definitions.

USB Header Pin Definitions

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

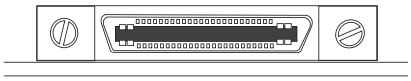
SATA DOM Power (JWF1)

The SATA DOM Power on JWF1 is used to supply power to SATA Disk-on-Module (DOM) solid-state storage devices.

5-10 I/O Port Definitions

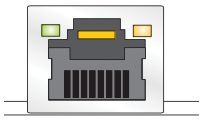
KVM Port

The KVM port supports two USB devices and VGA and UART interfaces. Please attach a compatible KVM connector/ switch to this port.



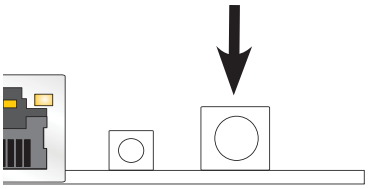
IPMI Port

A dedicated IPMI LAN port is located next to the KVM port to provide dedicated network connection for IPMI 2.0. This port accepts RJ45 type cables.



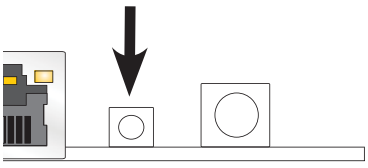
Power Button & LED

A Power Button and LED is located right next to the IPMI port. Push this button to turn on the motherboard. When lit, it indicates that this particular motherboard is turned on.



UID Button

The Unit ID (UID) Button is used in conjunction with the UID switch in front of the chassis and the UID LED located next to it. When the switch is turned on, the UID LED will turn on, making pinpointing of the node from the front or back panel easier, when servicing is required for instance. See UID LED on Chapter 2.

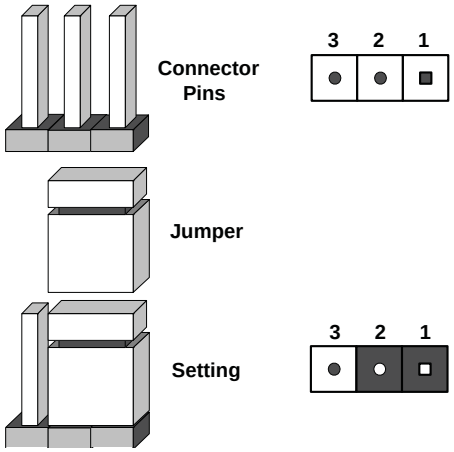


5-11 Jumper Settings

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). It is also recommended that you remove the onboard battery from the motherboard.

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 onboard battery and power on the system.

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

VGA Enable (JPG1)

JPG1 allows the user to enable the onboard VGA connector (through the KVM). Close pins 1~2 to enable the VGA. The default setting is Enabled.

VGA Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Watch Dog RST/NMI Selection (JWD1)

Watch Dog (JWD1) is a system monitor that can reboot the system when a software application hangs. Close pins 1~2 to reset the system if an application hangs. Close pins 2~3 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

SMB (I^2C) Bus to PCI Slots (JI2C1/ JI2C2)

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

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

BMC Enable/Disable (JPB1)

Jumper JPB1 allows you to enable the embedded BMC (Baseboard Management Controller) to provide IPMI 2.O/ KVM support on the motherboard. See the table on the right for jumper settings..

BMC Enable Jumper Settings	
Pin#	Definition
1-2	Enabled (default)
2-3	Disabled

ME Recovery (JPME1)

When enabled, Intel ME Recovery (JPME1) is used to update the ME (Management Engine) firmware. When disabled, the firmware is protected.

ME Recovery Jumper Settings	
Pin#	Definition
1-2	Enabled
2-3	Disabled (Default)

BIOS Recovery (JPME2)

When enabled, Intel ME Recovery (JPME2) is used to update the BIOS firmware. BIOS recovery is activated when this feature is enabled.

BIOS Recovery Jumper Settings	
Pin#	Definition
1-2	Enabled
2-3	Disabled (Default)

BIOS Write Protect (JPWP1)

When enabled, The firmware is protected from being accidentally erased or modified.

BIOS Write Protect Jumper Settings	
Pin#	Definition
1-2	Enabled (Default)
2-3	Disabled

PCI-E Vaux Select (JPEW1)

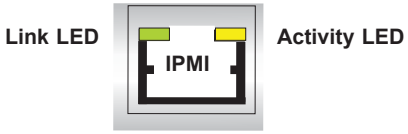
This jumper is used to select whether the PCI-E 3.3Vaux is from the normal 3.3V power plane or dual 3.3V standby power plane.

PCIE Vaux Select Jumper Settings	
Pin#	Definition
1-2	Normal 3.3V Power Plane (Default)
2-3	Dual 3.3V Standby Power Plane

5-12 Onboard Indicators

Dedicated IPMI LAN Port

A Dedicated IPMI LAN port is located on the I/O back panel. The yellow LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the table at right for more information.



LAN Link/Speed LED Indicator	
LED Color	Definition
Off	No Connection or 10 Mbps
Green (On)	100 Mbps

IPMI Heartbeat LED

An IPMI Heartbeat LED is located at LED4. When LED4 blinks, the IPMI functions properly. Refer to the table on the right for details. Also see the layout below for the LED location.

IPMI Heartbeat LED Indicator	
Blinking	IPMI is ready for use

System/Fan Fail LED

LED5 indicates a system or fan failure when illuminated. Please see the table on the right for message descriptions.

System/Fan Fail LED Indicator	
LED Color	Definition
Off	System Normal
Red (Solid)	System Overheat
Red (Blinking)	Fan Failure
Red (Blinking)	Power Failure

Unit ID LED

The Unit LED (LED6) is controlled by the Unit ID Button. It enables the user to pinpoint this particular motherboard that may be in need of service. Turn on the UID button in the front of the chassis or on the motherboard's I/O panel to identify the unit in need of servicing.

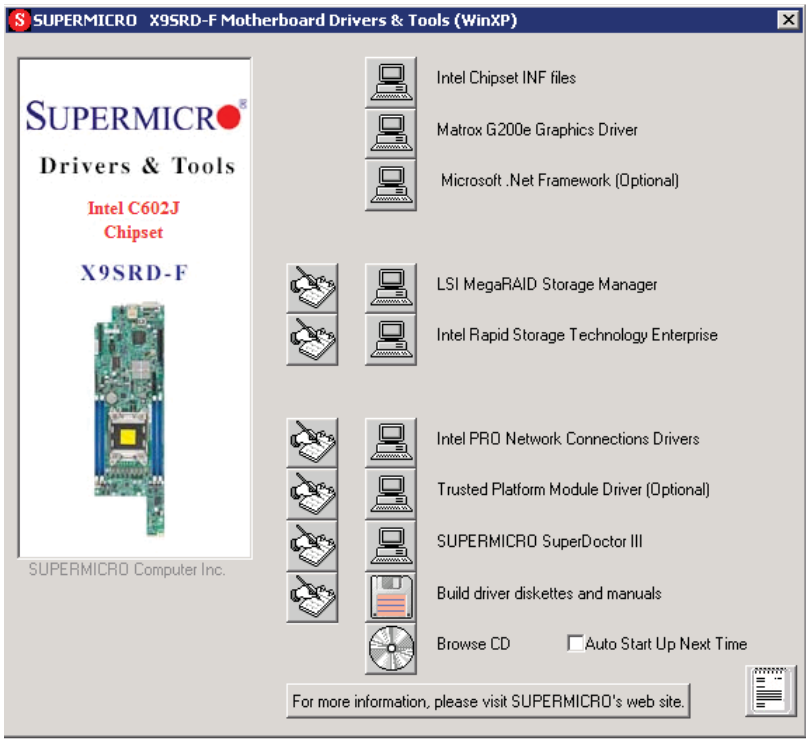
Unit ID LED LED Settings	
On (Steady)	Unit ID switch is on

5-13 SATA Drive Connections

The SATA drive connections are made automatically when a drive is inserted into its bay in the chassis. No cables are needed to make the power and data connections.

5-14 Installing Software

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



Driver/Tool Installation Display Screen

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

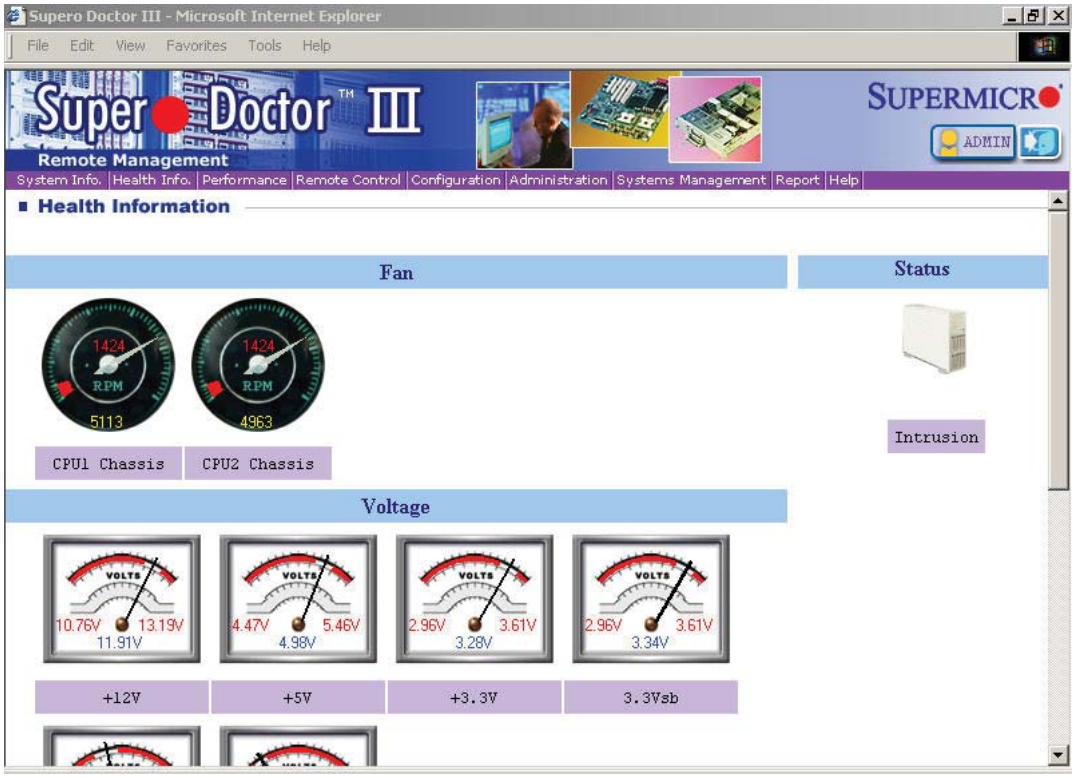
Supero Doctor III

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

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

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

Supero Doctor III Interface Display Screen (Health Information)



Supero Doctor III Interface Display Screen (Remote Control)

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

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC938H-R1620B 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.

Tools Required: 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 damage.

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 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.
- The person unpacking the system should be static protected.

6-2 Removing the Chassis Cover

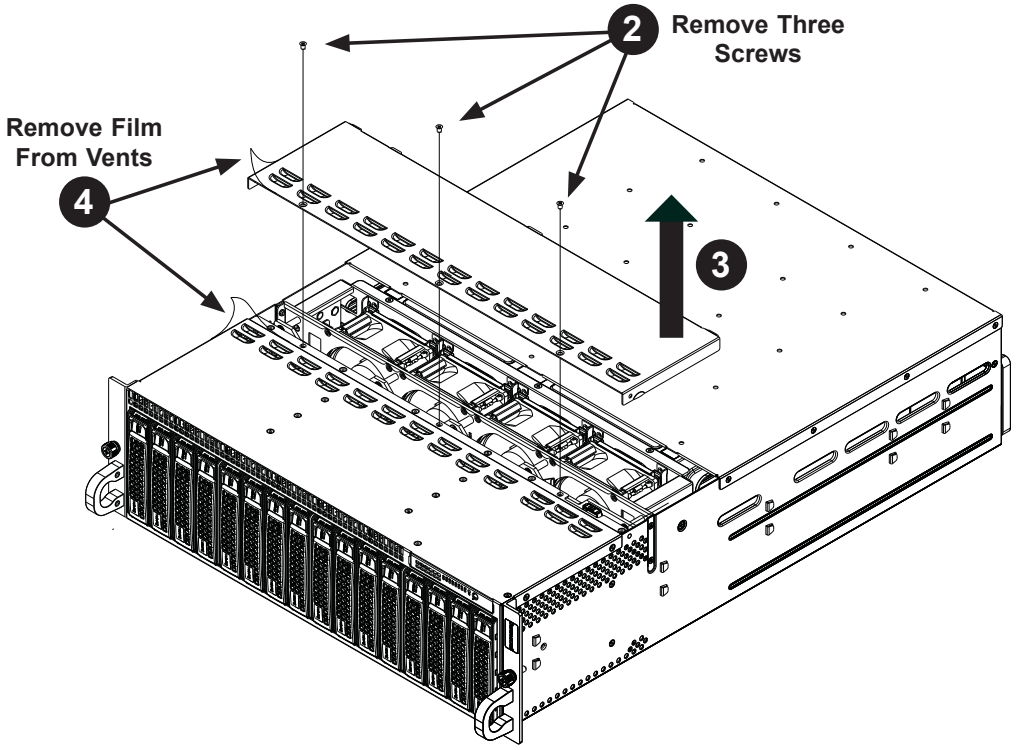


Figure 6-1. Removing the Chassis Cover

IMPORTANT: Before operating the SC938H for the first time, it is important to remove the protective film covering the ventilation openings on the top of the chassis. These vents provide proper ventilation and cooling for the system.

Removing the Chassis Cover and Protective Film

1. Disconnect the chassis from any power source.
2. Remove the three screws which secure the top cover to the chassis as illustrated above.
3. Lift the top cover up and off the chassis.
4. Peel off the protective film covering the top cover and the top of the chassis
5. Check that all ventilation openings on the top cover and the top of the chassis are clear and unobstructed.

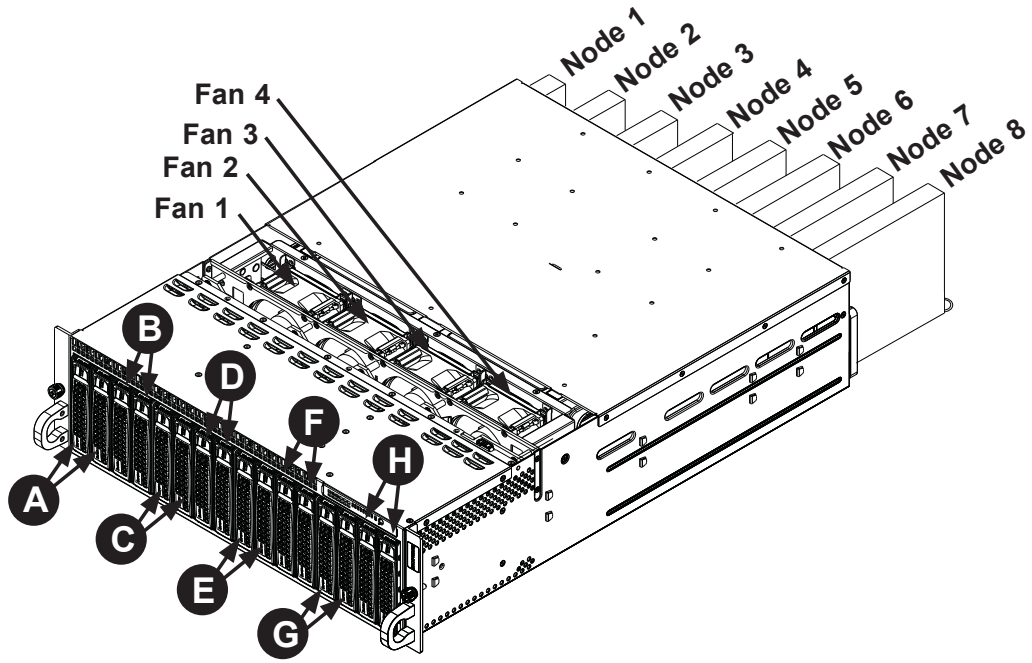
Warning: Except for short periods of time, do NOT operate the server without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

6-3 Corresponding Nodes, Fans and Hard Drives

The SC938H chassis contains eight individual motherboards contained in separate nodes. Each node controls two hard drives and shares a fan with the node beside it. Note that if a node is pulled out of the chassis, the hard drives associated with that node will power-down.

Corresponding Nodes, Fans and HDDs		
Node	Fan	HDDs
Node 1	Fan 1	HDDs A1 and A2
Node 2	Fan 1	HDDs B1 and B2
Node 3	Fan 2	HDDs C1 and C2
Node 4	Fan 2	HDDs D1 and D2
Node 5	Fan 3	HDDs E1 and E2
Node 6	Fan 3	HDDs F1 and F2
Node 7	Fan 4	HDDs G1 and G2
Node 8	Fan 4	HDDs H1 and H2

Figure 6-2. Corresponding Nodes, Fans and HDDs



6-4 Removing and Installing Hard Drives

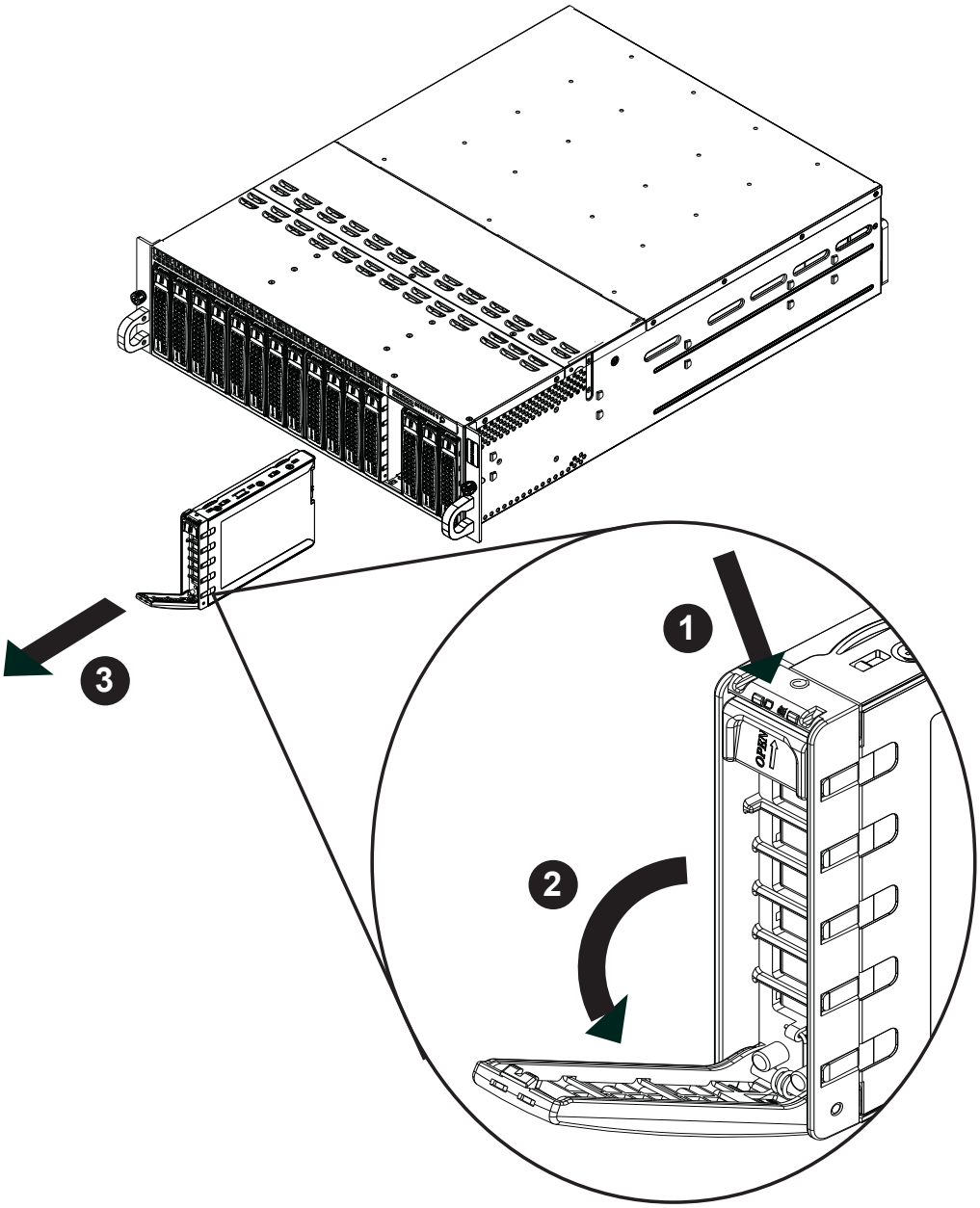
The SC938H features sixteen hot-swappable hard drives. These hard drives are contained in drive carriers and may be removed without powering-down the system.

Removing Hard Drive Carriers from the Chassis

1. Press the release button on the drive carrier, which will extend the drive carrier handle.

2. Use the drive carrier handle to pull the drive out of the chassis.

Figure 6-3. Removing a Hard Drive



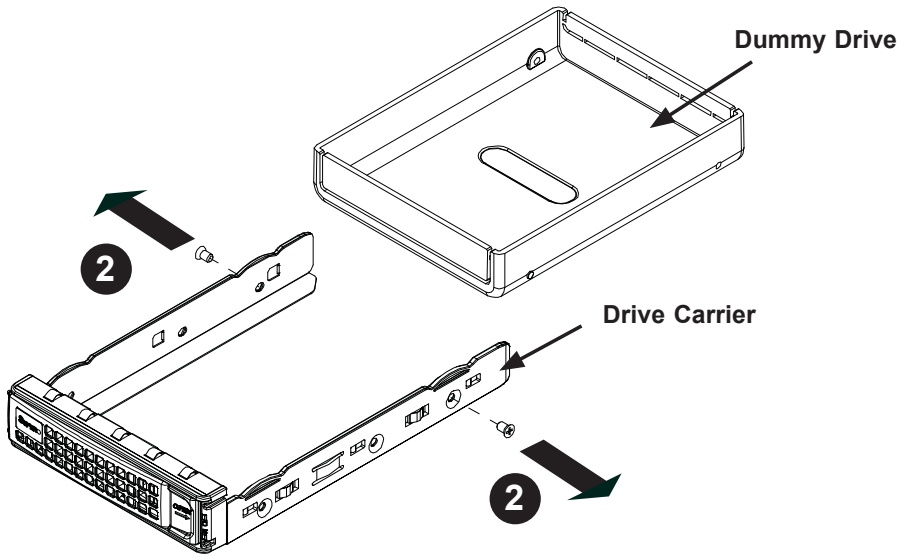


Figure 6-4. Removing a Dummy Drive from the Drive Carrier

The hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow through the drive bays.

Removing the Dummy Drive from the Drive Carrier

1. Remove the hard drive carrier from the chassis as described in the previous section and lay the drive carrier on a flat surface.

2. Remove the two screws securing the dummy drive to the drive carrier.

3. Lift the dummy drive from the drive carrier.

Warning: Except for short periods of time while swapping hard drives, do not operate the server with the hard drive bays empty. All carriers (even without hard drives present) must remain in their bays to maintain proper airflow.

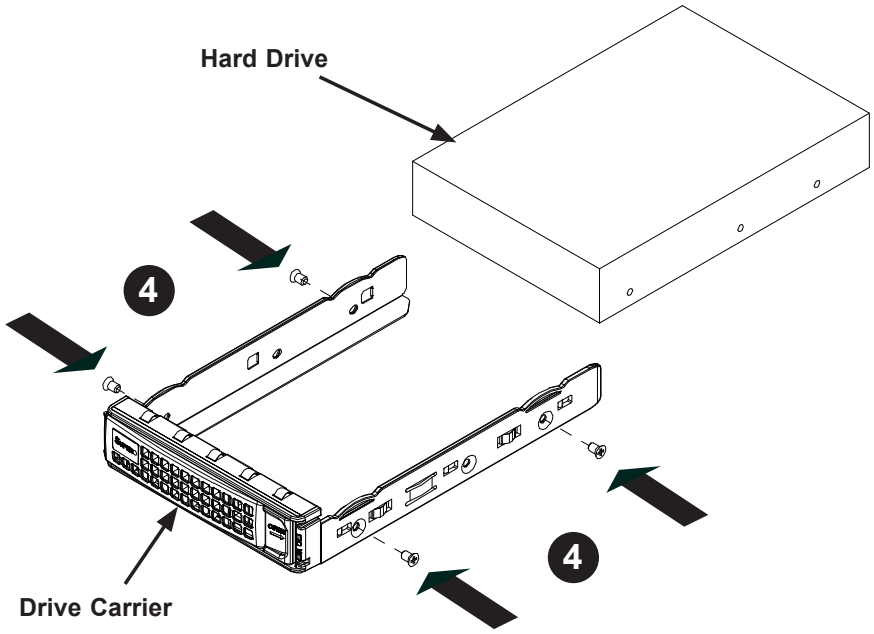


Figure 6-5. Installing a Hard Drive

Installing a Hard Drive into the Drive Carrier

1. Place the hard drive carrier on a flat surface.

2. Insert the hard drive into the carrier with the printed circuit board side facing downward and so that the mounting holes in the drive align with those in the drive carrier.

3. Secure the hard drive to the carrier with the four screws included with the hard drive.

4. Use the open handle of the drive carrier to insert the drive carrier into the open drive bay.

5. Secure the drive carrier into the drive bay by closing the drive carrier handle.

Regardless of how many hard drives are installed, all drive carriers must remain in the drive bays to promote proper airflow.

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

6-5 Removing and Installing the Backplane

The backplane is attached to the fan bracket, which is located in the midsection of the chassis. In the unlikely event of a backplane failure, follow the instructions below to replace it.

Removing the Backplane and Fan Bracket Assembly

Removing the Backplane and Fan Bracket from the Chassis

1. Power down the system and disconnect it from any power source.
2. Remove the chassis cover as described in section 6-2 of this manual.
3. Disconnect all cabling to the backplane.
4. Remove the six screws securing the fan bracket to the chassis and set them aside for later use.
5. Lift the fan bracket and backplane out of the chassis.

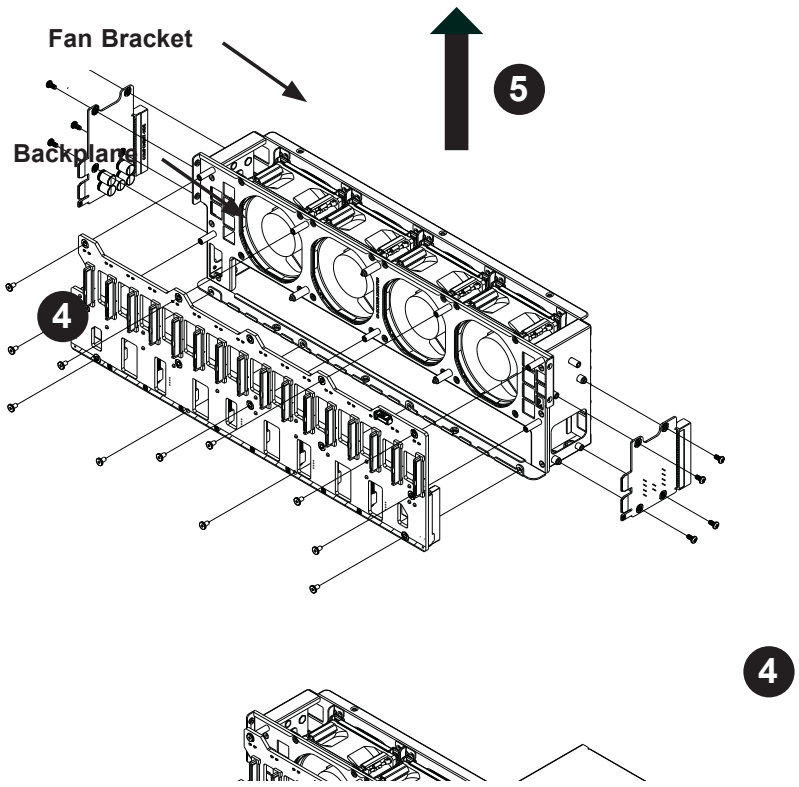


Figure 6-6. Removing the Fan Bracket and Backplane

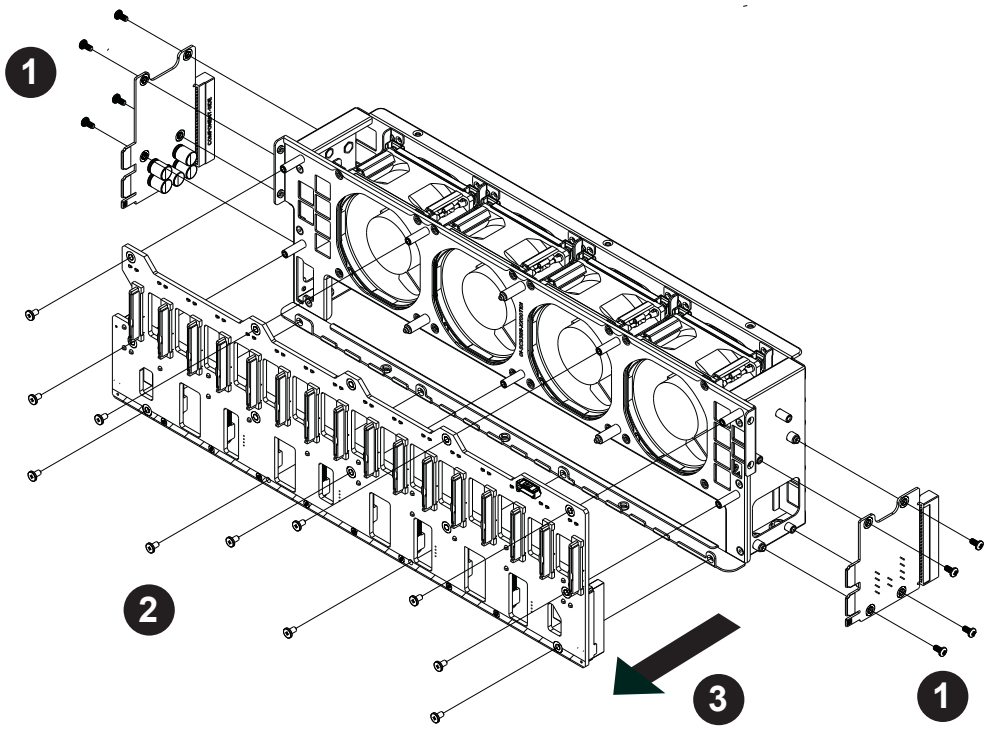


Figure 6-7. Removing the Backplane from the Fan Bracket

Removing the Backplane from the Fan Bracket

Removing the Backplane

1. Remove the eight screws securing the two side mounting brackets to the sides of the fan bracket and set them aside for later use. Remove the side mounting brackets.

2. Remove the eleven screws securing the backplane to the fan bracket and set these screws aside for later use.

3. Hold the backplane by its edges and carefully remove it from the fan bracket.

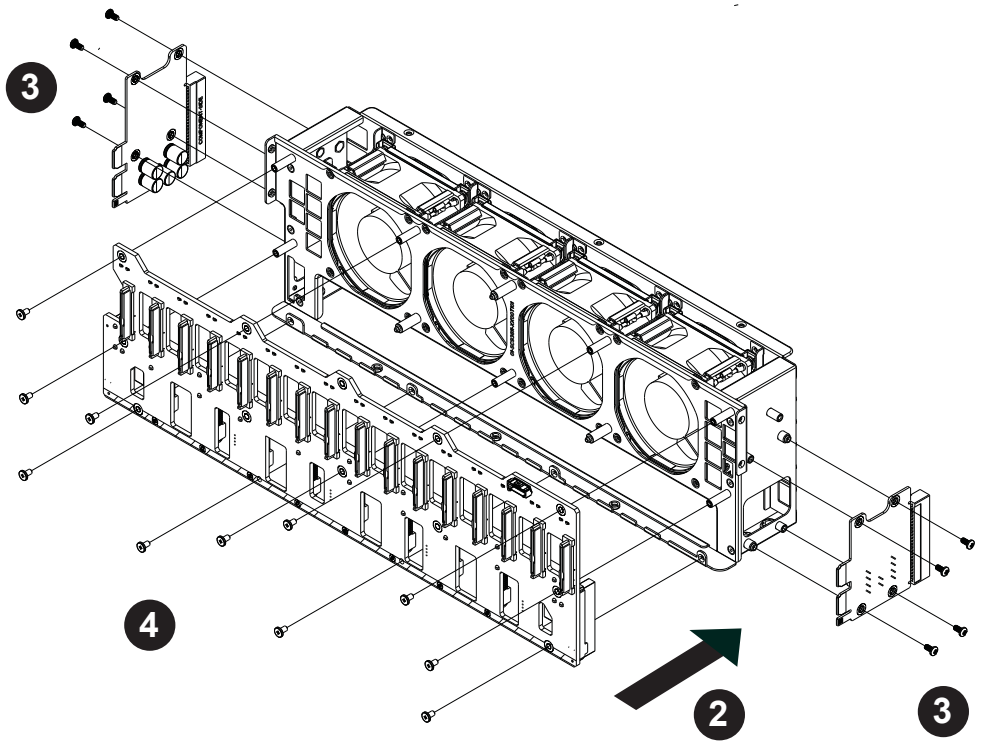


Figure 6-8. Installing the Backplane onto the Fan Bracket

Installing the Backplane onto the Fan Bracket

Installing the Backplane

1. Ensure that all power has been disconnected from the chassis.

2. Hold the backplane by its edges and carefully place it against the fan mounting bracket, aligning the mounting holes in the backplane with those in the fan bracket.

3. Secure the two side mounting brackets to the backplane with the eight screws previously set aside.

4. Secure the backplane to the front of the fan bracket using the eleven screws previously set aside.

5. Reconnect all wiring to the backplane.

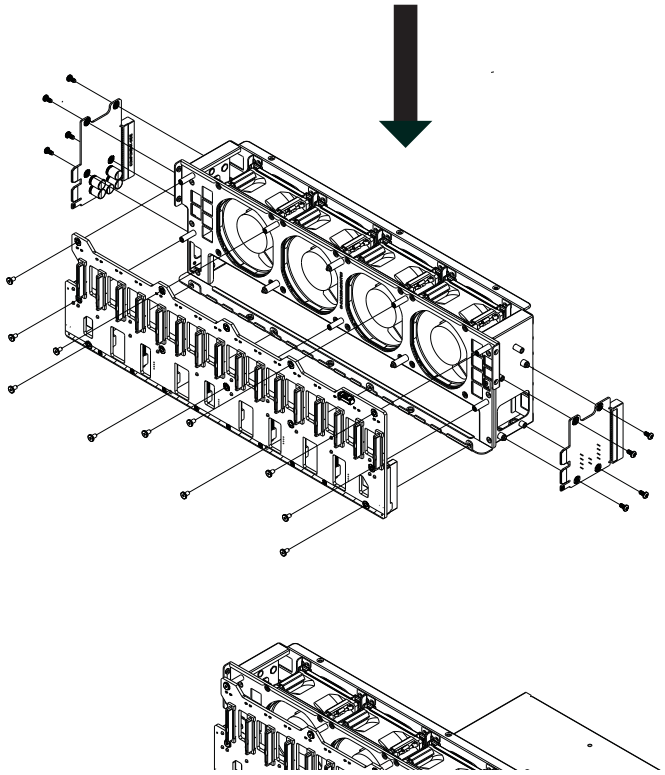


Figure 6-9. Installing the Backplane and Fan Bracket

Installing the Backplane and Fan Bracket Assembly

Installing the Backplane and Fan Bracket

1. Ensure that the chassis has been disconnected from any power source.
2. Remove the chassis cover as described in Section 6-2.
3. Reconnect the wiring to the backplane.
4. Insert the fan bracket and backplane assembly into the chassis as illustrated above.
5. Secure the fan bracket to the chassis with the six screws that were previously set aside.

6-6 Removing and Installing Motherboard Nodes

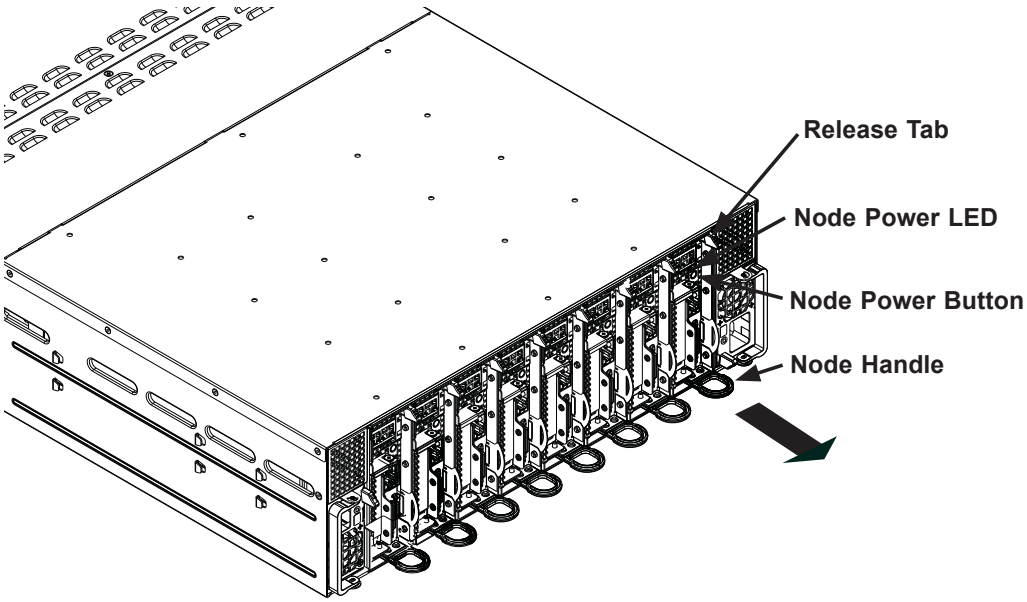


Figure 6-10. Removing Nodes from the System

The SC938H chassis comes equipped with eight removable nodes, each one containing an individual motherboard. Removing these nodes will also power-down the corresponding hard drives. See the table in Section 6-3 to determine which hard drives are controlled by each node.

Removing Nodes from the System

1. Power-down the individual node by pressing that node's power button.
2. Press and hold down the release tab on the back of the node.
3. Using the node's handle, pull the node from the chassis.

Warning: Except for short periods of time while swapping nodes, do not operate the server with the node bays empty. In the unlikely event of a node failure, remove the failed node and replace it with the dummy node that was included with the system..

6-7 Installing an Air Shroud

Air shrouds concentrate airflow to maximize fan efficiency. The SC938H chassis requires that air shrouds be used in each node.

Installing the Air Shroud

1. Make sure that the motherboard expansion card (if present) and all components are properly installed in each motherboard node.

2. Place the air shroud over the motherboard, as shown below. The air shroud sits behind the system fans and goes over the top of the motherboard and its components. Secure by inserting screws through the tabs and tightening.

3. Repeat the procedure for the remaining nodes.

4. Reverse this procedure to remove an air shroud.

6-8 System Fans

Four 8-cm fans circulate air through the chassis to lower the internal temperature. The SC938H system fans are designed to be easily changed, with no tools required and no need to remove any other parts inside the chassis. See Section 6-3 to determine which nodes and hard drives are cooled by each system fan.

Replacing a System Fan

1. If necessary, open the chassis top cover while the system is operating to determine which fan has failed. Never run the server for an extended period of time with the top cover open.

2. Remove the failed fan's power cord from the backplane.

3. Simultaneously squeeze both release tabs on the top of the fan module.

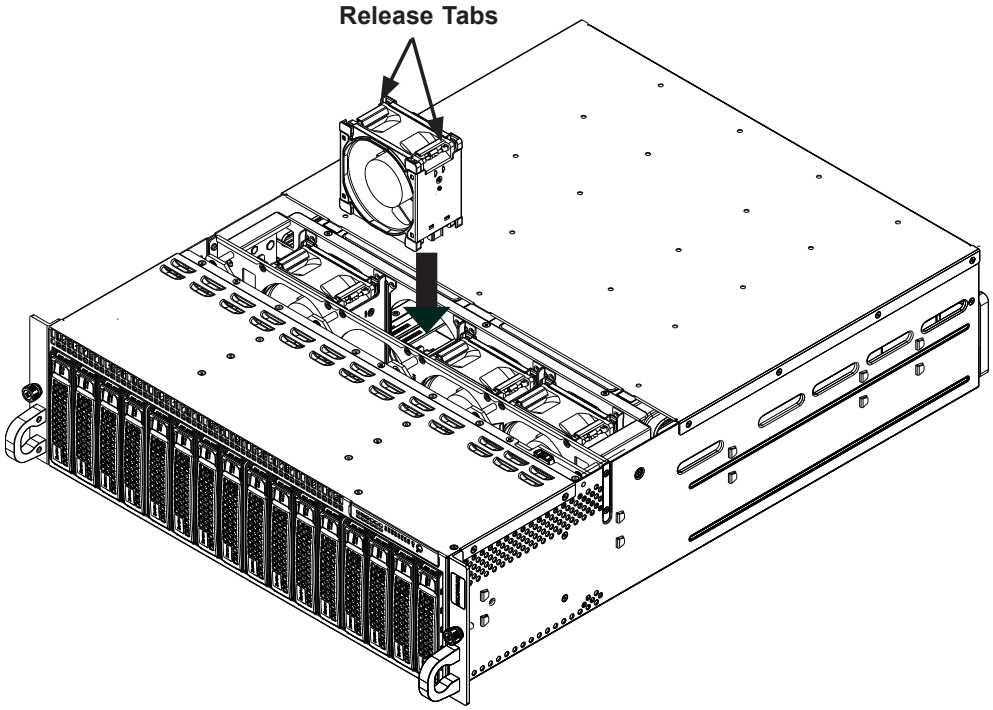
4. Lift the fan module up and out of the chassis.

5. Place the replacement fan into the vacant space in the fan bracket 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.

6. Put the fan back into the chassis and reconnect the cable.

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

Figure 6-11. System Fan Placement



6-9 Power Supply

The SC938H chassis includes a redundant 1620 watt power supply, which is auto-switching capable. This enables it to automatically sense and operate at a 100V to 240V input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

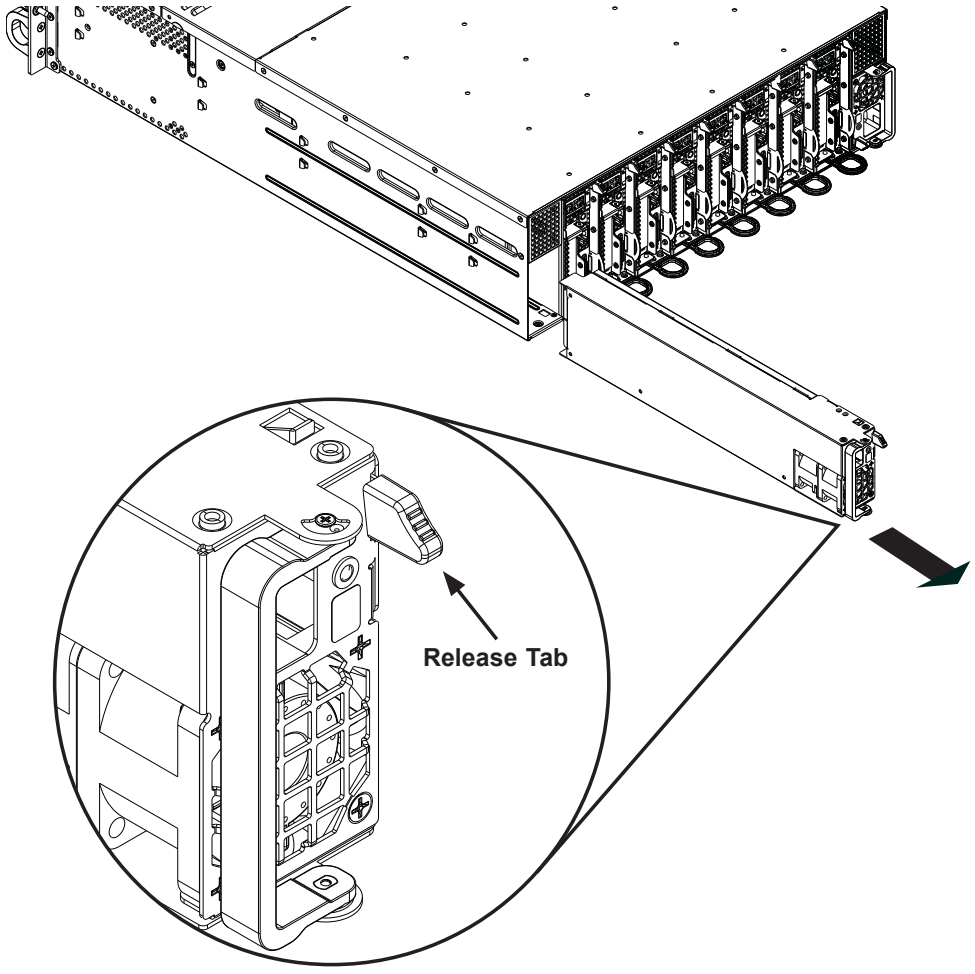
Power Supply Replacement

In the unlikely event that one of the power supplies needs to be replaced, one power supply can be removed without powering-down the system. Replacement power supply units may be ordered directly from Supermicro See the contact information in the Preface of this manual or visit www.supermicro.com.

Changing the Power Supply

1. Unplug the AC power cord from the failed power supply.
2. With the system running, press the release tab at the top of the power supply
3. Push and hold the release tab on the back of the power supply.
4. Pull the power supply out using the handle provided.
5. Push the replacement power supply module into the chassis' power bay until it clicks into the locked position.
6. Plug the AC power cord back into the power supply module and power- up the nodes if needed (with a single power supply failure, the nodes should continue to run).

Figure 6-12. Changing the Power Supply



Notes

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X9SRD-F motherboard. 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 informational text will accompany it. (**Note**: the AMI BIOS has default informational text built in. Supermicro retains the option to include, omit, or change any of these informational 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.

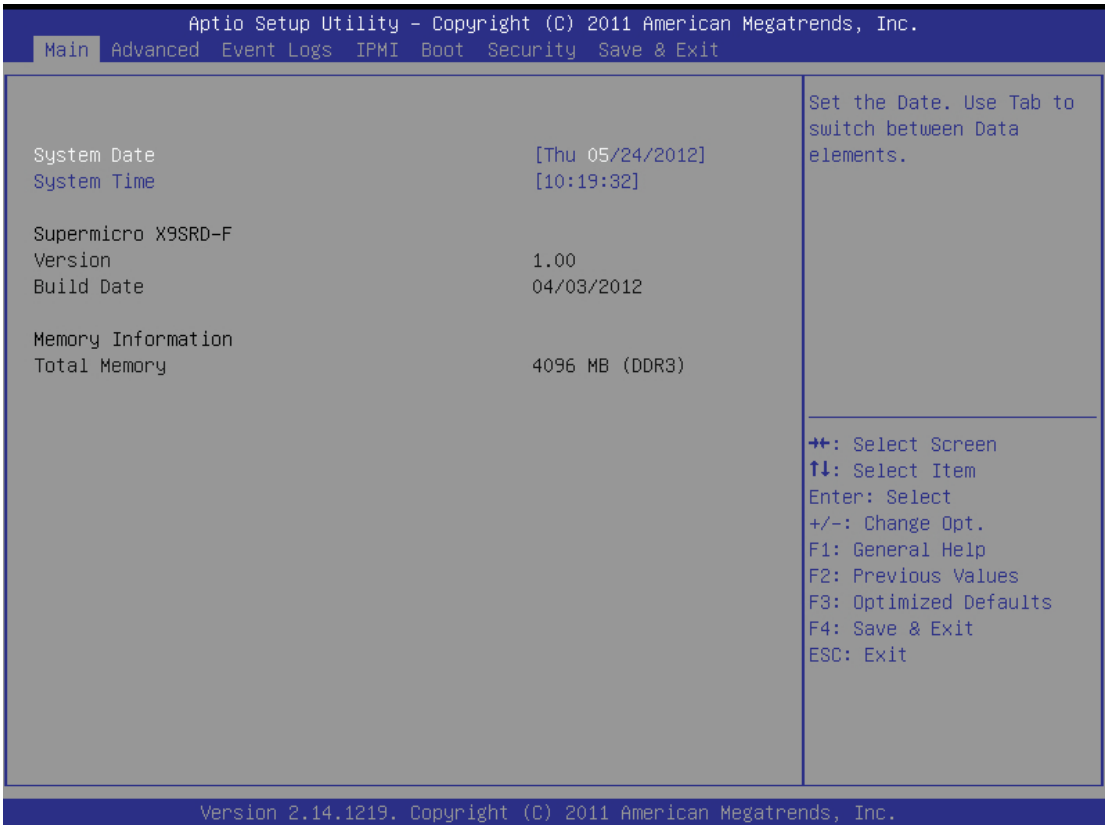
How to Start the Setup Utility

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 X9SRD-F

Version: This item displays the version of the BIOS used in the system.

Build Date: This item displays the day this version of BIOS was built.

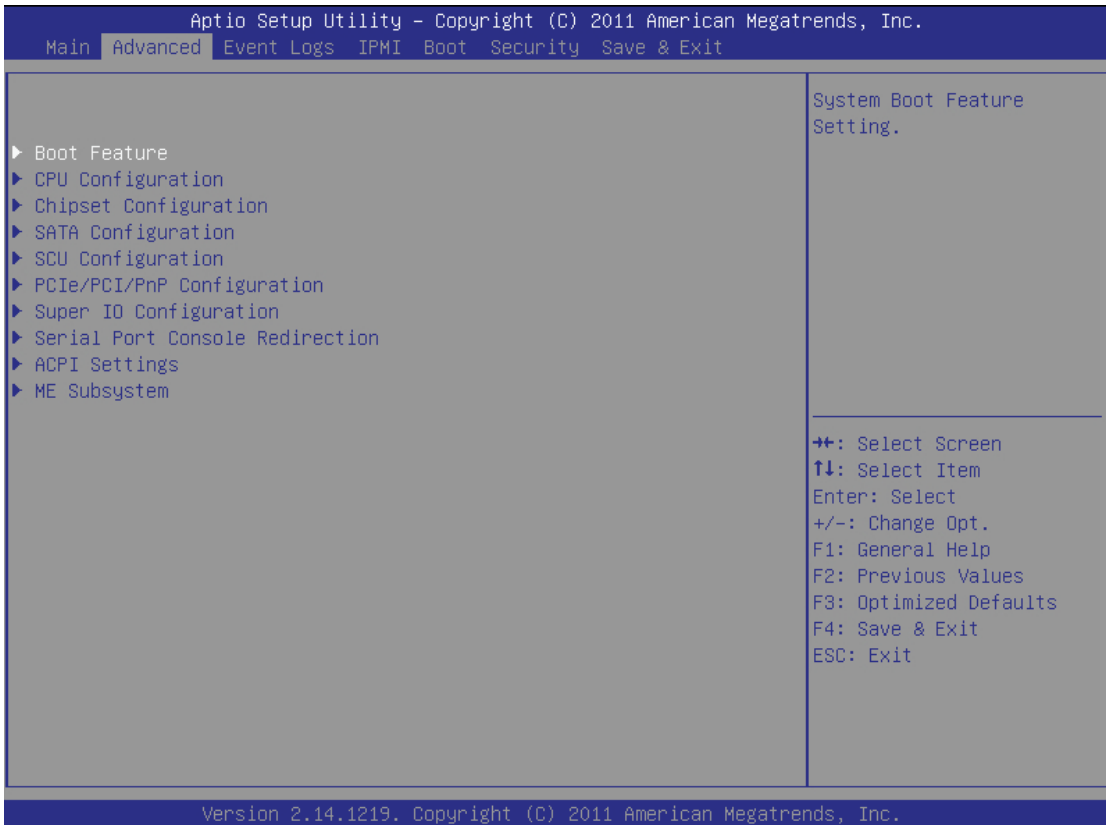
Memory Information

Total Memory

This displays the size of memory available in the system:

7-3 Advanced Setup Configurations

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



▶BOOT Feature

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**.

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.

Watch Dog Function

If enabled, the Watch Dog timer will allow the system to automatically reboot when a non-recoverable error occurs that lasts for more than five minutes. The options are Enabled and **Disabled.**

Power Button Function

This feature controls how the system shuts down when the power button is pressed. Select 4-Seconds Override to force the user to press and hold the Power Button for 4 seconds before the system turns off. Select Instant Off if you want the system to instantly power off when the Power Button is pressed. The options are 4 Seconds Override and **Instant Off.**

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, Stay Off and **Last State**.

▶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.

▶Socket 1 CPU Information

This item is for informational purposes only and displays CPU information including type, speed, number of cores, etc.

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.

Hyper Threading

Set to Enabled to use the processor's Hyper Threading Technology feature. The options are **Enabled** and Disabled.

Active Processor Cores

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All,** 1, 2, 4, and 6.

Limit CPUID Maximum

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.)

Intel® AES-NI

Set to Enabled to use the processor's Advanced Encryption Standard (AES) feature. The options are **Enabled** and Disabled.

MLC Streamer Prefetcher (Available when supported by the CPU)

If set to Enabled, the MLC (mid-level cache) streamer prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disabled and **Enabled**.

MLC Spatial Prefetch (Available when supported by the CPU)

If this feature is set to Disabled, The CPU prefetches the cache line for 64 bytes. If this feature is set to Enabled the CPU fetches both cache lines for 128 bytes as comprised. The options are Disabled and **Enabled**.

DCU Streamer Prefetcher

This feature enables prefetch of the next L1 data line based on multiple loads in the same cache line. The options are **Enabled** and Disabled.

DCU IP Prefetcher

Set this feature to Enabled to activate the L1 Data Prefetcher based on sequential load history. The options are **Enabled** and Disabled.

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

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

▶CPU Power Management Configuration

Power Technology

This feature determines what power-saving scheme the motherboard uses. The options are Disabled, **Energy Efficient** and Custom. If Custom is selected, the following options become available:

EIST

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

Turbo Mode

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

CPU C3 Report

Select Enabled to allow the BIOS to report the CPU C3 State (ACPI C2) to the operating system. During the CPU C3 State, the CPU clock generator is turned off. The options are Enabled and **Disabled.**

CPU C6 Report

Select Enabled to allow the BIOS to report the CPU C6 State (ACPI C3) to the operating system. During the CPU C6 State, the power to all cache is turned off. The options are **Enabled** and Disabled.

CPU C7 Report

Select Enabled to allow the BIOS to report the CPU C7 State (ACPI C3) to the operating system. CPU C7 State is a processor-specific low C-State. The options are **Enabled** and Disabled.

Package C State Limit

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are C0, C2, **C6**, and No Limit.

Energy/Performance Bias

Use this feature to select an appropriate fan setting to achieve maximum system performance (with maximum cooling) or maximum energy efficiency with maximum power saving). The fan speeds are controlled by the firmware management via IPMI 2.0. The options are Performance, **Balanced Performance**, Balanced Energy, and Energy Efficient.

Long duration power limit - this is the processor power consumption limit (in Watts) during a long duration time window.

Long duration maintained - this is the time in milliseconds where the Long Duration Power Limit is maintained.

Short duration power limit - During Turbo Mode, the system may exceed the processor's default power setting and exceed the Short Duration Power limit. By increasing this value, the processor can provide better performance for a short duration.

▶Chipset Configuration

WARNING: Setting the wrong values in the following sections may cause the system to malfunction.

▶North Bridge Configuration

This item displays the current IO chipset Revision.

▶Integrated IO Configuration

Intel® VT-d

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

Data Direct I/O

Select Enabled to enable Intel I/OAT (I/O Acceleration Technology), which significantly reduces CPU overhead by leveraging CPU architectural improvements and freeing the system resource for other tasks. The options are Disabled and **Enabled**.

DCA Support

This feature accelerates the performance of I/O devices using Direct Cache Access. The default is **Enabled** and can not be changed.

Port 1A Link Speed

This feature enables the user to select the target link speed for this slot. The options are **GEN1** , GEN2, and GEN3.

Port 1B Link Speed

This feature enables the user to select the target link speed for this slot. The options are GEN1 , GEN2, and **GEN3**.

Port 1A Link Speed

This feature enables the user to select the target link speed for this slot. The options are GEN1 , GEN2, and **GEN3**.

Port 1A Link Speed

This feature enables the user to select the target link speed for this slot. The options are GEN1 , GEN2, and **GEN3**.

Port 1A Link Speed

This feature enables the user to select the target link speed for this slot. The options are GEN1 , GEN2, and **GEN3**.

Port 1A Link Speed

This feature enables the user to select the target link speed for this slot. The options are GEN1 , GEN2, and **GEN3**.

▶DIMM Configuration

Memory Configuration

This section displays memory status such as Current Memory Mode, Memory Speed, Mirroring and Sparing information.

▶DIMM Information

This feature displays information regarding the installed memory.

Memory Mode

The only option is **Independent**, a feature that allows for all DIMMs to be available to the operating system.

DRAM RAPL Mode

RAPL which stands for Running Average Power Limit is a feature that provides mechanisms to enforce power consumption limits on supported processors The options are DRAM RAPL MODE0 , **DRAM RAPL MODE1**, and Disabled.

DDR Speed

Use this option to force the system memory to run at a different frequency than the default frequency. The available options are **Auto**, Force DDR-800, Force DDR-1066, Force DDR-1333, Force DDR3-1600 and Force SPD.

Channel Interleaving

This feature selects from the different channel memory interleaving methods. The options are **Auto,** 1 Way, 2 Way, 3 Way and 4 Way.

Rank Interleaving

This feature selects from the different rank memory interleaving methods. The options are **Auto,** 1 Way, 2 Way, 4 Way and 8 Way.

Patrol Scrub

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected on a memory module and send the correction to the requestor (the original source). When this item is set to Enabled, the North Bridge will read and write back one cache line every 16K cycles, if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the North Bridge will be scrubbed every day. The options are **Enabled** and Disabled.

Demand Scrub

Demand Scrubbing is a process that allows the CPU to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error, the error is corrected and sent to the requestor (the original source). Memory is updated as well. Select Enabled to use Demand Scrubbing for ECC memory correction. The options are Enabled and **Disabled**.

Data Scrambling

This feature enables Data Scrambling. The options are **Enabled** and Disabled.

Device Tagging

This feature enables Device Tagging. The options are Enabled and **Disabled**.

Thermal Throttling

This feature selects from the different throttling methods. The options are Disabled and **CLTT** (Closed Loop Thermal Throttling).

▶South Bridge Configuration

This item displays the current South Bridge Revision.

All USB Devices

This feature enables all USB ports/devices. The options are **Enabled** and Disabled. When set to enabled, EHCI Controller 1 and 2 (below) become available.

EHCI Controller 1 / EHCI Controller 2

This feature enables the Enhanced Host Controller Interface (EHCI). The options are **Enabled** and Disabled.

Legacy USB Support

This feature enables support for legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disabled to have USB devices available only for EFI applications. The options are **Enabled,** Disabled and Auto.

Port 60/64 Emulation

This feature enables I/O port 60h/64h emulation support. This should be enabled for complete USB keyboard legacy support for non-USB aware Operating Systems. The options are **Enabled,** and Disabled.

EHCI Hand-Off

This item is for Operating Systems that does not support Enhanced Host Controller Interface (EHCI) hand-off. When enabled, EHCI ownership change will be claimed by the EHCI driver. The settings are Enabled and **Disabled**.

▶SATA Configuration

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

SATA Port0~Port5

This item displays the information detected on the installed SATA drives on the particular SATA port.

SATA Mode

This item selects the mode for the installed drives. The options are Disabled, IDE Mode, **AHCI Mode** and RAID Mode. The following are displayed depending on your selection:

IDE Mode

The following items are displayed when IDE Mode is selected:

Serial-ATA Controller 0~1

This feature is used to activate/deactivate the SATA controller, and sets the compatibility mode. The options are Disabled, Enhanced, and Compatible. The default of Serial-ATA Controller 0 is **Compatible**. The default of Serial-ATA Controller 1 is **Enhanced**.

AHCI Mode

The following items are displayed when AHCI Mode is selected:

Aggressive Link Power Management

When Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link in a low power mode during extended periods of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are **Enabled** and Disabled.

Port 0~5 Hot Plug

Set this item to Enabled to enable hot-plugging for the particular port. The options are **Enabled** and Disabled.

Staggered Spin Up

Set this item to Enabled to enable Staggered Spin-up support. The options are Enabled and **Disabled**.

RAID Mode

The following items are displayed when RAID Mode is selected:

Port 0~5 Hot Plug

Set this item to Enabled to enable hot-plugging for the particular port. The options are **Enabled** and Disabled.

▶SCU Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the SAS SCU devices and displays the following items:

Storage Controller Unit (SCU)

Set this item to Enabled to activate the chipset's SCU devices. The options are **Enabled** and Disabled.

OnChip SCU Option ROM

Set this item to Enabled to activate the onboard SAS option ROM. The options are **Enabled** and Disabled.

▶PCIe/PCI/PnP Configuration

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

PCI ROM Priority

In case of multiple Option ROMs (Legacy and EFI-compatible), this feature specifies what ROM to launch. The options are **Legacy ROM** and EFI Compatible ROM.

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 PCI Bus Clocks, **64 PCI Bus Clocks**, 96 PCI Bus Clocks, 128 PCI Bus Clocks, 160 PCI Bus Clocks, 192 PCI Bus Clocks, 224 PCI Bus Clocks and 248 PCI Bus Clocks.

Above 4G Decoding

Set this item to Enabled to activate 64-bit capable devices to be decoded above the 4G address space. This works only if the system supports 64-bit PCI decoding. The options are Enabled and **Disabled**.

PERR# Generation

Set this item to Enabled to allow PCI devices to generate PERR# error codes. The options are Enabled and **Disabled**.

SERR# Generation

Set this item to Enabled to allow PCI devices to generate SERR# error codes. The options are Enabled and **Disabled**.

Maximum Payload

This feature selects the setting for the PCIE maximum payload size. The options are **Auto,** 128 Bytes**, and** 256 Bytes.

Maximum Read Request

This feature selects the setting for the PCIE maximum Read Request size. The options are **Auto,** 128 Bytes**,** 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes**.**

ASPM Support

Set this item to the desired ASPM (Active State Power Management) level. The options are **Disabled,** Auto and Force L0s.

Onboard LAN Option ROM Select

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

Load Onboard LAN1 Option ROM / Load Onboard LAN2 Option ROM

This feature is to enable or disable the onboard option ROMs. The default for LAN 1 is **Enabled**. The default for LAN 2 is **Disabled**.

Load Onboard SAS Option ROM

Select Enabled to use the onboard SAS Option ROM to boot the computer using a SAS device. The options are **Enabled** and Disabled.

VGA Priority

This option allows the user to specify which graphics controller to be used as the primary boot device. The options are **Onboard** and Offboard.

▶Super IO Configuration

▶Serial Port 1 Configuration

Serial Port 1

Select Enabled to enable the onboard serial port. The options are **Enabled** and Disabled.

Serial Port 1 Settings

This option specifies the base I/O port address and the Interrupt Request address of the serial port. The options for Serial Port 1 are listed below.

Auto,

IO=3F8h; IRQ=4;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

▶Serial Port Console Redirection

These submenus allow the user to configure Console Redirection settings.

COM 1/SOL

Console Redirection

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and Disabled. (The default setting for COM1 is **Disabled**, and for SOL is **Enabled**.)

▶Console Redirection Settings

This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, **VT100+**, and VT-UTF8.

Bits Per Second

This item sets the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600, and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 and **8** (Bits).

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark, and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

Flow Control

This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are **Enabled** and Disabled.

Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

Legacy OS Redirection Resolution

Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are 80x24 and **80x25**.

Putty Keypad

Use this feature to select function key and keypad setting on Putty. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

This item allows the user to configure Console Redirection settings to support Out-of-Band Serial Port management.

Console Redirection

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and **Disabled**.

▶Console Redirection Settings

This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

Out-of-Band-Mgmt Port

Use this feature to select the port for out-of-band management. The options are **COM1** and SOL.

Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, **VT100+**, and VT-UTF8.

Bits Per Second

This item sets the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 57600, and **115200** (bits per second).

Flow Control

This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None,** Hardware RTS/CTS, and Software Xon/Xoff.

Data Bits, Parity, Stop Bits

The status of these features is displayed.

▶ACPI Configuration

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

ACPI Sleep State

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

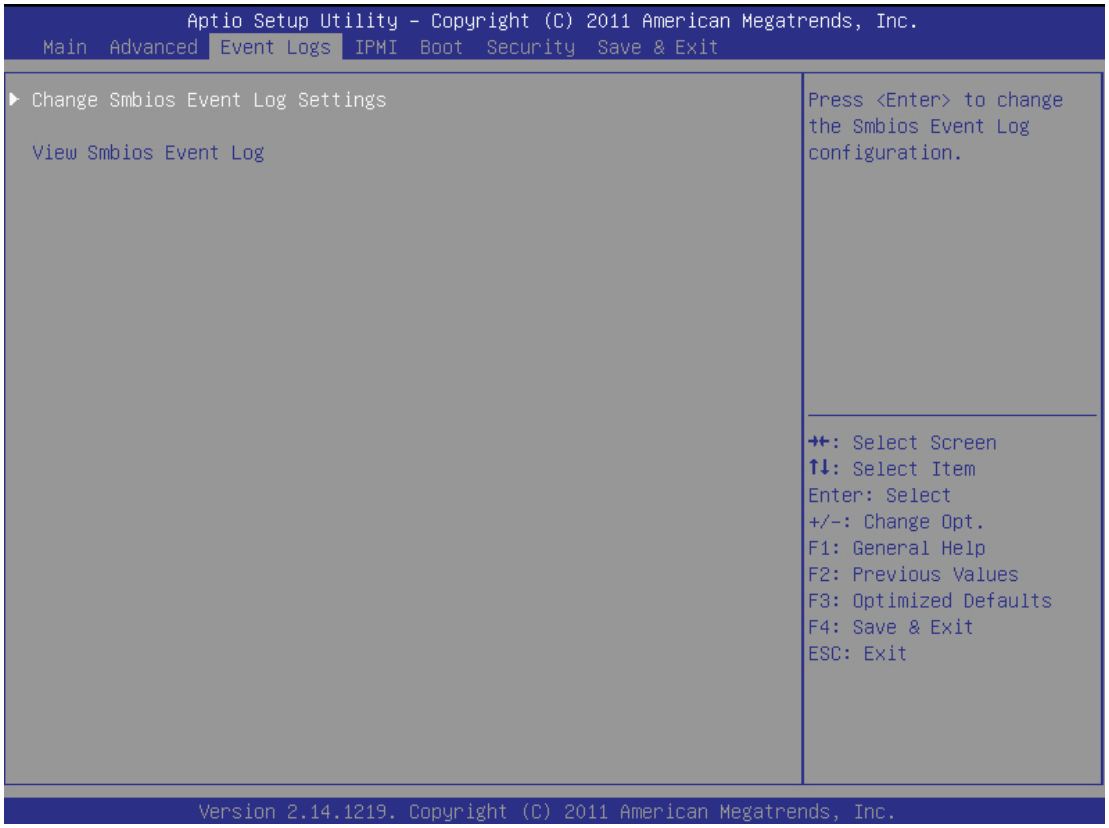
High Precision Event Timers

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.

▶ME Subsystem

This item displays the ME Subsystem information.

7-4 Event Logs



▶Change SmBIOS Event Log Settings

Smbios Event Log

Change this item to enable or disable all features of the Smbios Event Logging during boot. The options are **Enabled** and Disabled.

Runtime Error Logging Support

Change this item to enable or disable runtime error logging. The options are **Enabled** and Disabled.

Memory Correction Error Threshold

Change this item to define the system's memory correction error threshold. Directly enter a numeric value. The default value is **10**.

PCI Error Logging Support

Change this item to enable or disable runtime error logging. The options are Enabled and **Disabled**.

Erase Event Log

This option erases all logged events. The options are **No**, Yes, Next reset and Yes, Every reset.

When Log is Full

This option automatically clears the Event Log memory of all messages when it is full. The options are **Do Nothing** and Erase Immediately.

Log System Boot Event

This option toggles the System Boot Event logging to enabled or disabled. The options are **Disabled** and Enabled.

MECI

The Multiple Event Count Increment (MECI) counter counts the number of times a duplicate event must happen before the MECI counter is incremented. This is a numeric value. The default value is **1**.

METW

The Multiple Event Time Window (METW) defines number of minutes must pass between duplicate log events before MECI is incremented. This is in minutes, from 0 to 99. The default value is **60**.

View SmBIOS Event Log

This feature displays the contents of the SmBIOS Event Log.

7-5 IPMI Settings

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.

▶System Event Log

This feature is used to change the System Event Log (SEL) configuration.

SEL Components - Change this item to enable or disable all features of System Event Logging. The options are **Enabled** and Disabled. When Enabled, the following can be configured:

Erase SEL - This option erases all logged SEL events. The options are **No**, Yes, On Next reset and Yes, On Every reset.

When SEL Full

This option automatically clears the System Event Log memory of all messages when it is full. The options are **Do Nothing** and Erase Immediately.

Log EFI Status Codes

This option enables or disables the logging of Extensible Firmware Interface (EFI) status codes. The options are **Enabled** and Disabled.

▶BMC Network Configuration

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

Update IPMI LAN Configuration

This feature allows the user to decide if the BIOS should configure the IPMI setting at next system boot. The options are **No** and Yes. If the option is set to Yes, the user is allowed to configure the IPMI settings at next system boot.

Configuration 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) "Dynamic" or manually entered by the user "Static". When Dynamic is selected, all the options below are automatically assigned to the system by itself or by an external DHCP server. If Static is selected, the IP Address, Subnet Mask and Gateway Address must be manually entered below. The options are Static and **DHCP**.

Station 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.

Station MAC Address - 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).

Gateway IP Address - Enter the Gateway or Router address (i.e., 192.168.10.1).

7-6 Boot Settings

Use this feature to configure Boot Settings:

Boot Options Priorities

This feature allows the user to specify which devices are boot devices and the order of priority from which the systems boots during startup.

Boot Option #1, Boot option #2, etc.

The settings are [**any detected boot device**] and Disabled.

USB Device BBS Priorities

This option sets the order of the legacy USB devices detected by the motherboard.

Add New Boot Option

This feature allows the user to add a new boot device.

Add Boot Option

Use this item to enter the name of the new boot option.

Select Filesystem

Use this item to select from a list of available filesystems.

Path for Boot Option

Use this item to enter the boot option path, using the following format:

fs0:\path\filename.efi.

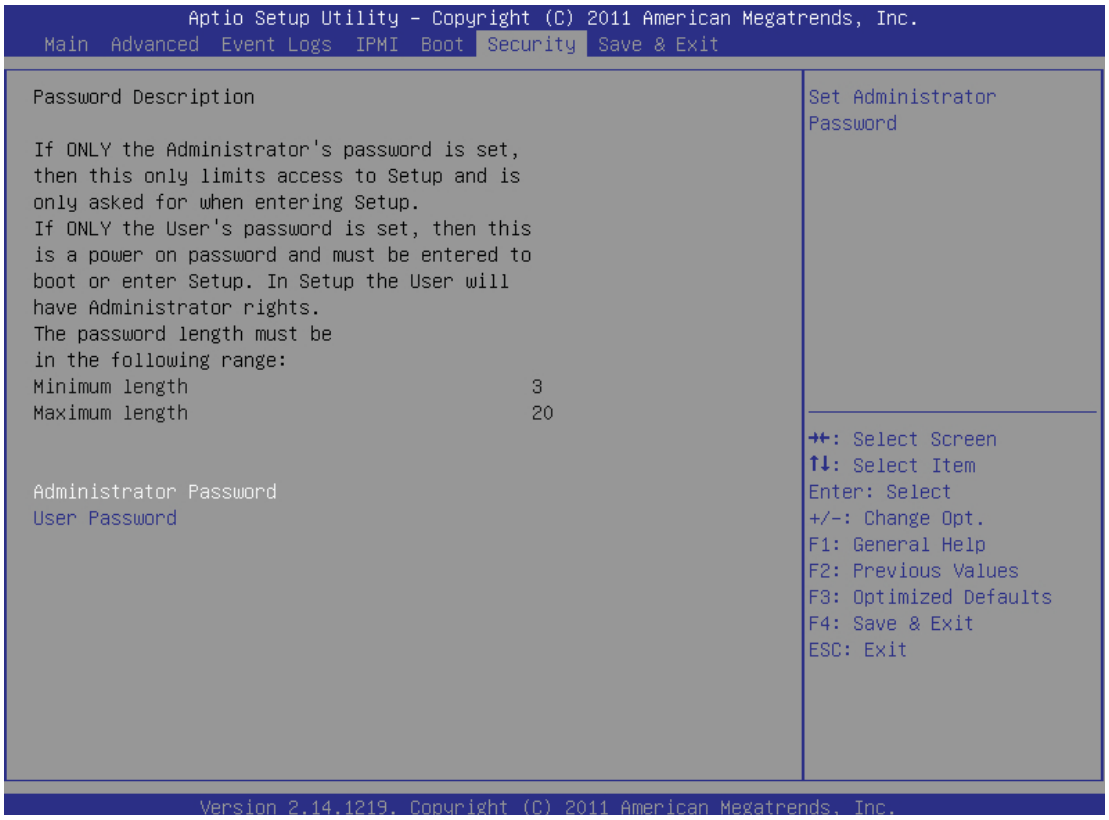
Create

Use this item to create the new boot option based on the settings above.

▶Delete Boot Option

This feature allows the user to delete a previously defined boot device from the boot priorities list. The settings are [any pre defined boot device]

7-7 Security Settings



- If the Administrator password is defined ONLY - this controls access to the BIOS setup ONLY.
- If the User's password is defined ONLY - this password will need to be entered during each system startup or boot, and will also have Administrator rights in the setup.
- Passwords must be at least 3 and up to 20 characters long.

Administrator Password

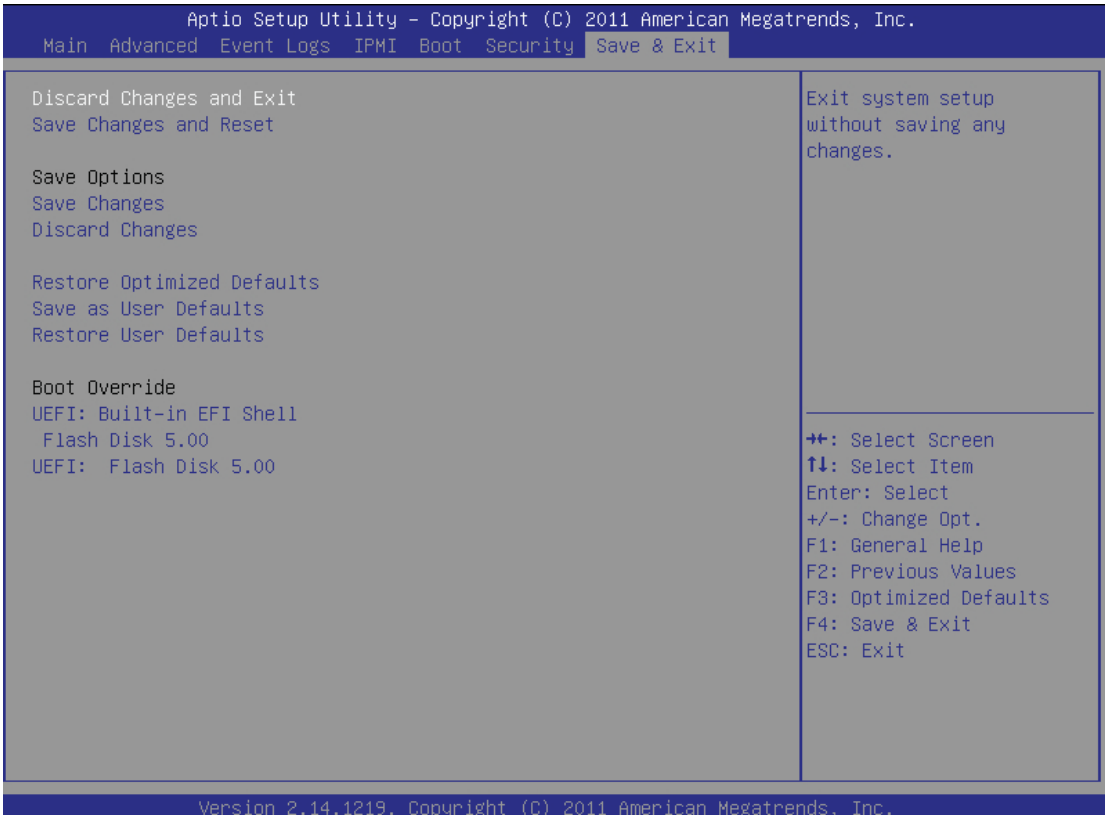
Press Enter to create a new, or change an existing Administrator password.

User Password:

Press Enter to create a new, or change an existing User password.

7-8 Save & Exit

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



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>.

Save Changes and Reset

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

Save Changes

When you have completed the system configuration changes, select this option to save any changes made. This will not reset (reboot) the system.

Discard Changes

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

Restore Optimized Defaults

To set this feature, select Restore Defaults from the Exit menu and press <Enter>. These are factory settings designed for maximum system stability, but not for maximum performance.

Save As User Defaults

To set this feature, select Save as User Defaults from the Exit menu and press <Enter>. This enables the user to save any changes to the BIOS setup for future use.

Restore User Defaults

To set this feature, select Restore User Defaults from the Exit menu and press <Enter>. Use this feature to retrieve user-defined settings that were saved previously.

Boot Override

Listed on this section are other boot options for the system (i.e., Built-in EFI shell). Select an option and press <Enter>. Your system will boot to the selected boot option. This is a one-time override.

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

Processors

Each node supports one Intel E5-2600 Series processor in an LGA 2011 socket

Note: Please refer to our web site for a complete listing of supported processors.

Chipset

Intel C600

BIOS

64 Mb AMIBIOS® SM Flash BIOS

Memory Capacity

Each node supports up to 128 GB of ECC DDR3-1600/1333/1066 RDIMM memory

Note: See the memory section in Chapter 5 for details.

Drive Bays

Sixteen hot-swap drive bays to house 3.5" SATA drives

Expansion Slots

Each node supports the use of one PCI-E 3.0 x8 low-profile add-on card (6.6" maximum length)

Motherboard

X9SRD-F (proprietary form factor)
Dimensions: 4.75" x 15.95" (120.7 x 405 mm)

Chassis

SC938BH-R1K62B (3U rackmount)
Dimensions: (WxHxD) 17.26 x 5.21 x 23.2 in. (438 x 132 x 589 mm)

Weight

Gross (Bare Bone): 62.2 lbs. (28.3 kg)

System Cooling

Four 8-cm system fans

System Input Requirements

AC Input Voltage: 100 - 240V AC auto-range

Rated Input Current: 11.5 - 5.5A max

Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 1620W (Part# PWS-1K62P-1R) 80 Plus Bronze Certified

Rated Output Voltages: +12V (84A @ 100-120VAC, 100A @ 120-140VAC, 135A @ 180-264VAC), +5Vsb (4A)

Operating Environment

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

Regulatory Compliance

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

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

Safety:
EN 60950/IEC 60950-Compliant
UL Listed (USA)
CUL Listed (Canada)
TUV Certified (Germany)
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”

(continued from front)

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