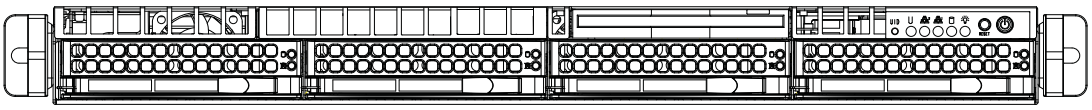
SUPERMICRO®

SUPERSERVER

5017R-WRF



USER'S MANUAL

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.

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 5017R-WRF. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 5017R-WRF is a 1U rackmount server based on the SC815TQ-R500WB chassis and the X9SRW-F motherboard.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X9SRW-F motherboard and the SC815TQ-R500WB chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the 5017R-WRF into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here 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 5017R-WRF.

Chapter 5: Advanced Motherboard Setup

Chapter 5 provides detailed information on the X9SRW-F motherboard, including the locations and functions of connections, 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 SC815TQ-R500WB server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

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

Appendix A: BIOS Error Beep Codes

Appendix B: System Specifications

Notes

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Chapter 1

Introduction

1-1 Overview

The SuperServer 5017R-WRF is a 1U server comprised of two main subsystems: the SC815TQ-R500WB chassis and the X9SRW-F motherboard. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

In addition to the motherboard and chassis, various hardware components have been included with the 5017R-WRF, as listed below:

- Three 4-cm chassis fans (FAN-0086L4)
- One passive CPU heatsink (SNK-P0047PS)
- Two riser cards (RSC-R1UW-E8R and RSC-R1UW-2E16)
- SATA Accessories
  One hard drive backplane (BPN-SAS-815TQ)
  Four drive carriers (MCP-220-00075-0B)
- One CD containing drivers and utilities
- SuperServer 5017R-WRF User's Manual

Optional

- One rackmount kit (PT51L)

1-2 Motherboard Features

At the heart of the SuperServer 5017R-WRF lies the X9SRW-F, a single processor motherboard based on the Intel® C600-A/D chipset. Below are the main features of the X9SRW-F. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X9SRW-F supports a single Intel® Xeon E5-2600/E5-1600 series processor in an LGA2011 socket. Please refer to our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X9SRW-F has eight DIMM sockets that can support up to 256 GB of DDR3-1600/1333/1066 ECC R/LRDIMMs (LRDIMM = Reduced Load DIMMs) or up to 64GB of ECC UDIMMs. Please refer to Chapter 5 for installing memory.

SATA

A SATA controller is integrated into the chipset to provide a six-port, SATA subsystem, which is RAID 0, 1, 5 and 10 supported. The SATA drives are hot-swappable units. Two of the ports support SATA 3.0 (6 Gb/s) while the other four are SATA 2.0 (3 Gb/s) ports.

Note: You must have RAID set up to enable the hot-swap capability of the SATA drives. Documentation on RAID setup guidelines can be found on our web site.

SCU SATA

An additional SCU SATA controller integrated into the chipset provides four SATA 2 ports. RAID 0, 1 and 10 are supported. The SATA drives are hot-swappable units.

Note: You must have RAID set up to enable the hot-swap capability of the SATA drives. Documentation on RAID setup guidelines can be found on our web site.

Onboard Controllers/Ports

The color-coded I/O ports include one COM port, a VGA (monitor) port, four USB 2.0 ports, two gigabit Ethernet ports and an IPMI port.

Intel® Intelligent Power Node Manager (NM)

The Intel® Intelligent Power Node Manager (IPNM) provides your system with real-time thermal control and power management for maximum energy efficiency. Although IPNM Specification Version 1.5 is supported by the BMC (Baseboard

Management Controller), your system must also have IPNM-compatible Manageability Engine (ME) firmware installed to use this feature.

1-3 Server Chassis Features

The 5017R-WRF is built upon the SC815TQ-R500WB chassis. Details on the chassis and on servicing procedures can be found in Chapter 6. The following is a general outline of the main features of the chassis.

System Power

The SC815TQ-R500WB features a redundant 500W power supply consisting of two power modules. The system does not need to be shut down when replacing or removing a single power supply module.

Hard Drive Subsystem

The SC815TQ-R500WB chassis was designed to support four hot-swap SATA hard drives.

Front Control Panel

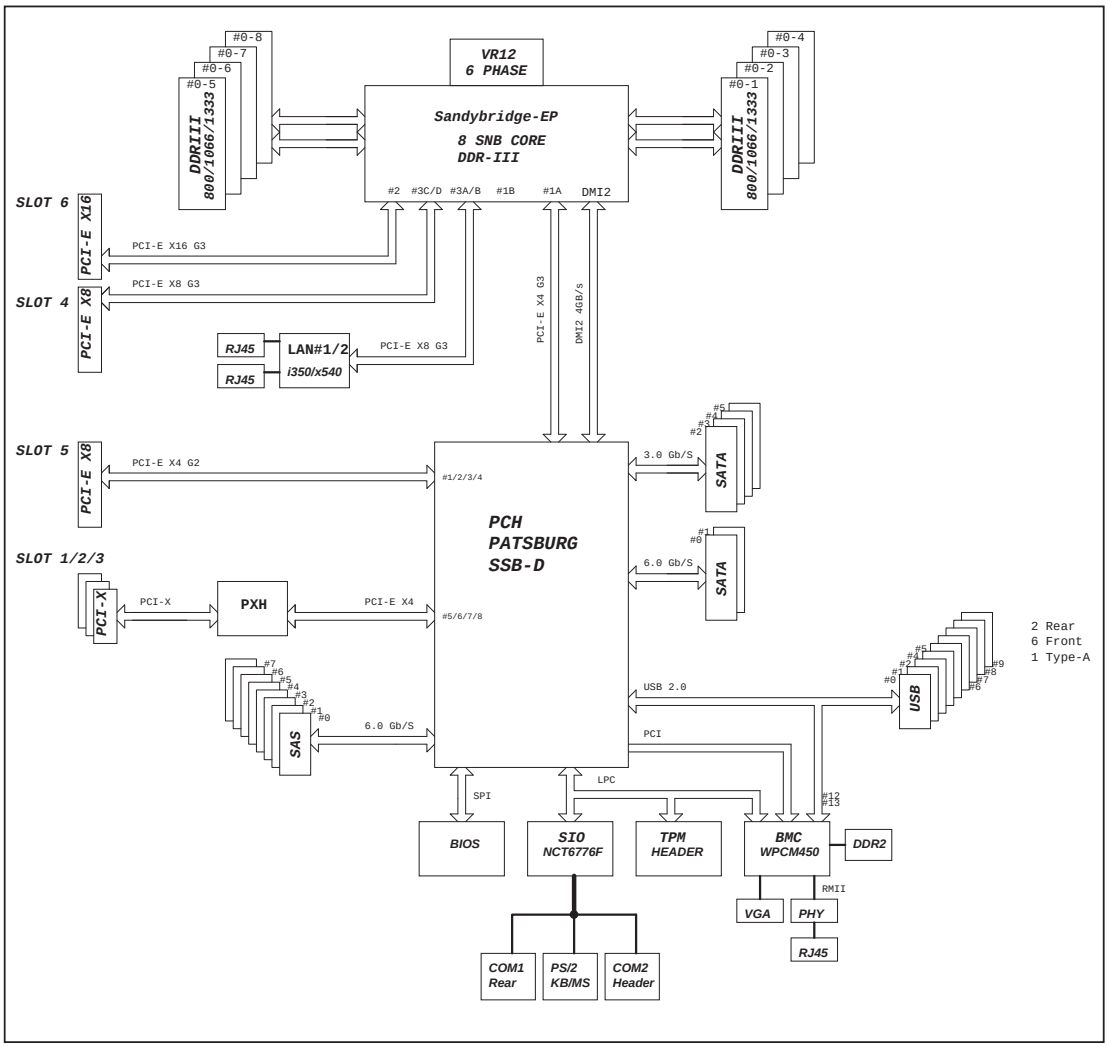
The chassis' control panel provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity (two) and UID/overheat/fan fail/power fail. A main power button and system reset button is also included.

Cooling System

The SC815TQ-R500WB chassis has an innovative cooling design that features three sets of 4-cm counter-rotating fans located in the middle section of the chassis. There is a "Fan Speed Control Mode" setting in BIOS that allows chassis fan speed to be determined by system temperature. The power supply module also includes a cooling fan.

Figure 1-1. Intel C600 Chipset:
System Block Diagram

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



1-4 Contacting Supermicro

Headquarters

Address:	Super Micro Computer, Inc.
	980 Rock Ave.
	San Jose, CA 95131 U.S.A.
Tel:	+1 (408) 503-8000
Fax:	+1 (408) 503-8008
Email:	marketing@supermicro.com (General Information)
	support@supermicro.com (Technical Support)
Web Site:	www.supermicro.com

Europe

Address:	Super Micro Computer B.V.
	Het Sterrenbeeld 28, 5215 ML
	's-Hertogenbosch, The Netherlands
Tel:	+31 (0) 73-6400390
Fax:	+31 (0) 73-6416525
Email:	sales@supermicro.nl (General Information)
	support@supermicro.nl (Technical Support)
	rma@supermicro.nl (Customer Support)

Asia-Pacific

Address:	Super Micro Computer, Inc.
	4F, No. 232-1, Liancheng Rd.
	Chung-Ho 235, Taipei County
	Taiwan, R.O.C.
Tel:	+886-(2) 8226-3990
Fax:	+886-(2) 8226-3991
Web Site:	www.supermicro.com.tw
Technical Support:	
Email:	support@supermicro.com.tw
Tel:	866-2-8226-5990

Notes

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 5017R-WRF 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 SuperServer 5017R-WRF 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 5017R-WRF. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the SuperServer 5017R-WRF was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) 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 the rack.

- 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 5017R-WRF into a rack unit with the rack rails provided. If the system has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6.

There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

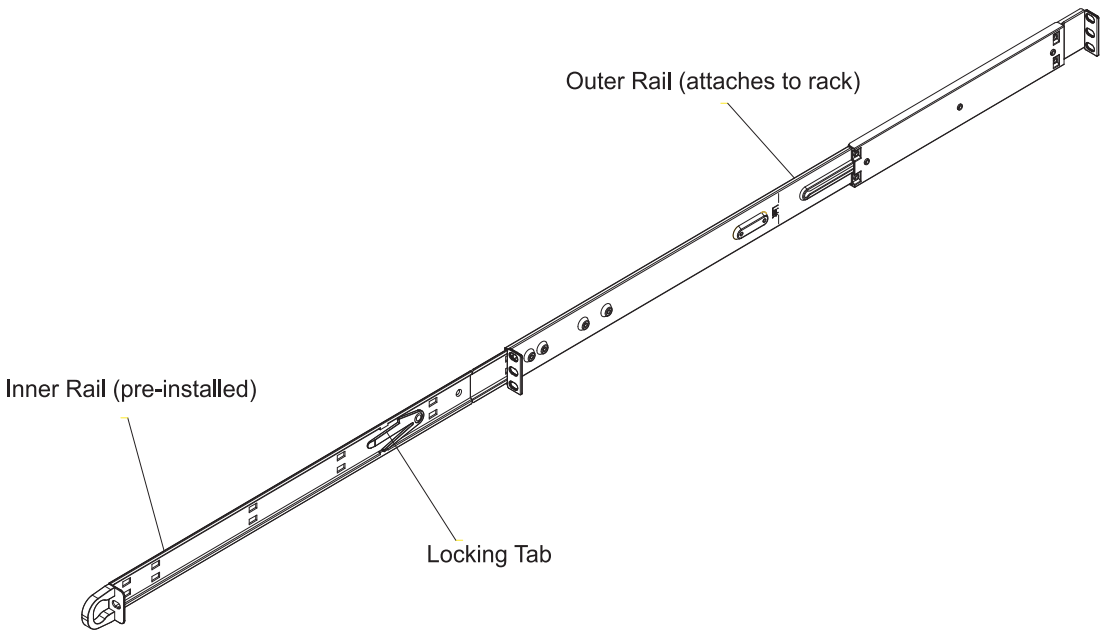
Identifying the Sections of the Rack Rails

You should have received two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself (see Figure 2-1). Two pairs of short brackets to be used on the front side of the outer rails are also included.

Installing the Inner Rails

Both the left and right side inner rails have been pre-attached to the chassis. Proceed to the next step.

Figure 2-1. Identifying the Sections of the Rack Rails (right side rail shown)

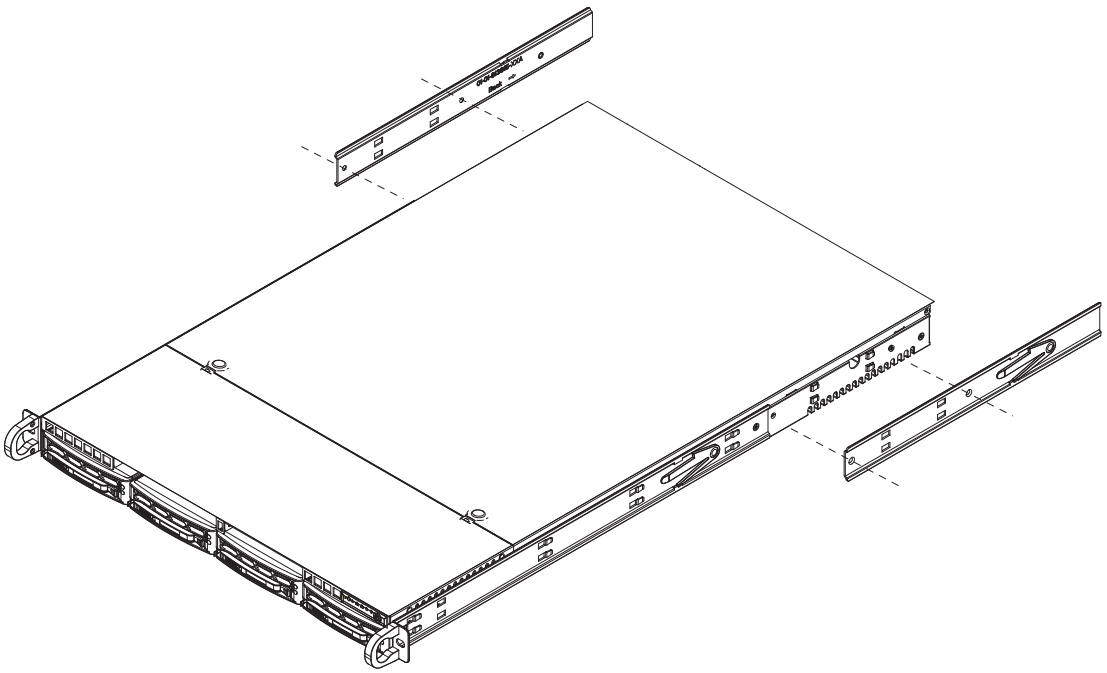


Installing the Outer Rails

Begin by measuring the distance from the front rail to the rear rail of the rack. Attach a short bracket to the front side of the right outer rail and a long bracket to the rear side of the right outer rail. Adjust both the short and long brackets to the proper distance so that the rail can fit snugly into the rack. Secure the short bracket to the front side of the outer rail with two screws and the long bracket to the rear side of the outer rail with three screws. Repeat these steps for the left outer rail.

Locking Tabs: Both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Figure 2-2. Installing the Rack Rails

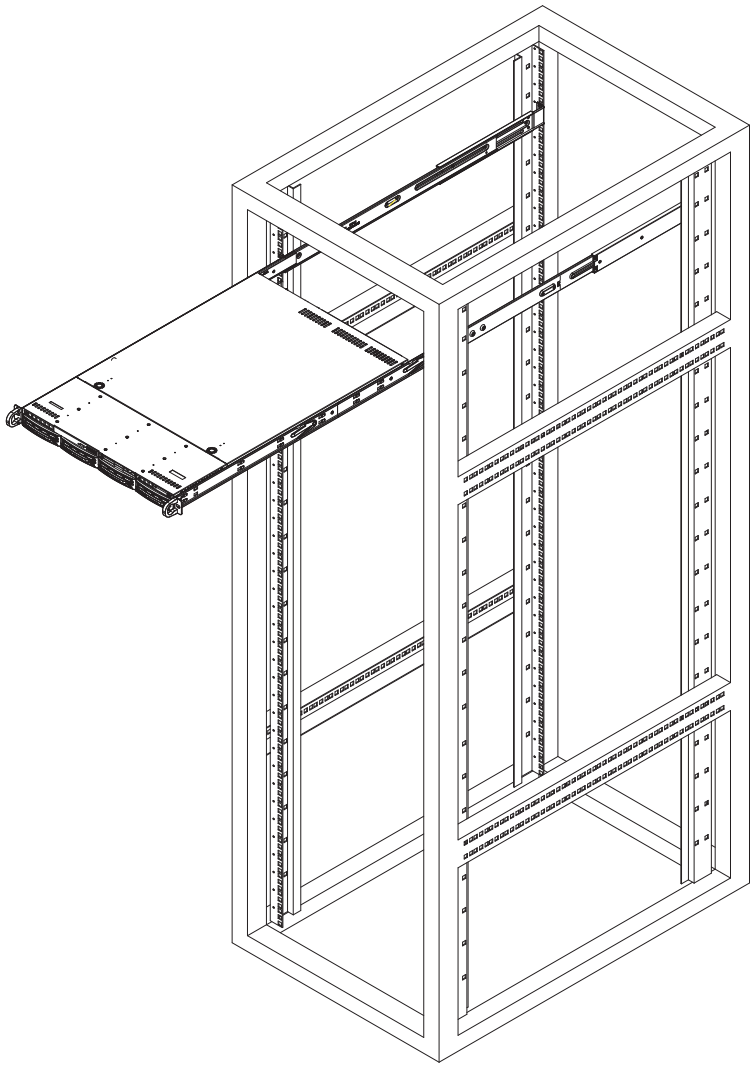


Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-3.

When the server has been pushed completely into the rack, you should hear the locking tabs "click".

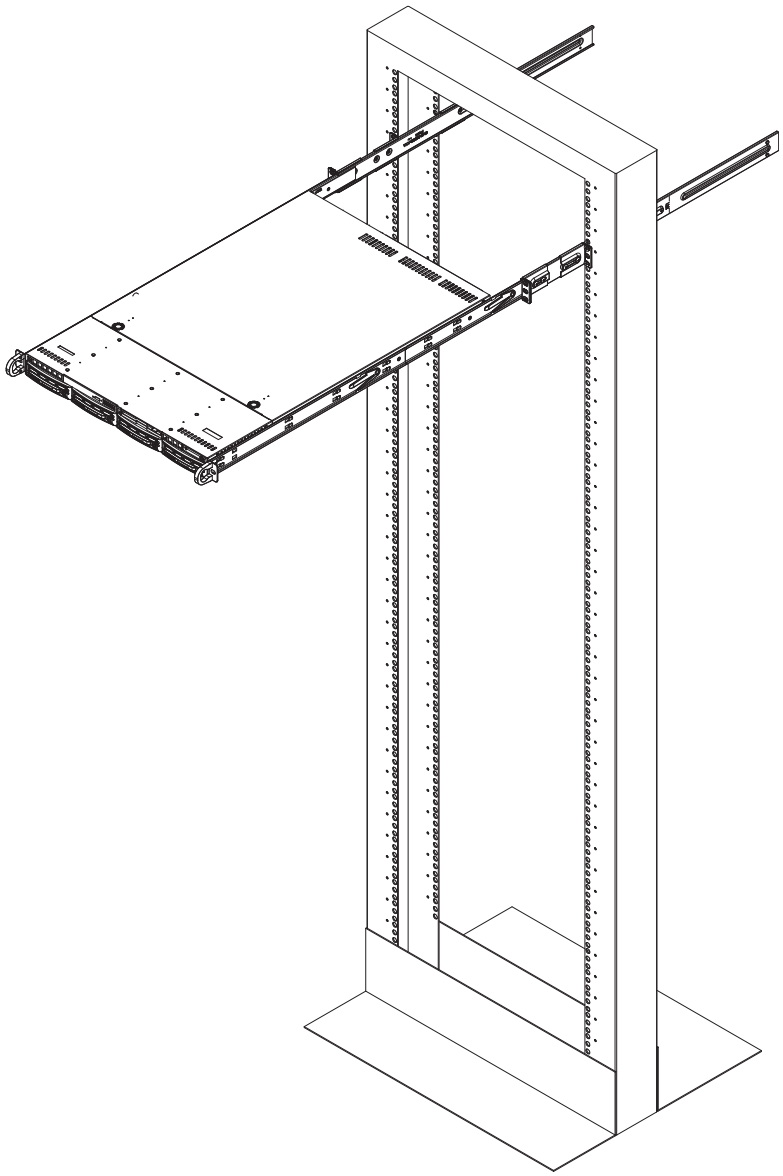
Figure 2-3. Installing the Server into a Rack



Installing the Server into a Telco Rack

To install the 5017R-WRF into a Telco type rack, use two L-shaped brackets on either side of the chassis (four total). First, determine how far follow the server will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on your server, remove it. Then attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the telco rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack.

Figure 2-4. Installing the Server into a Telco Rack



Notes

Chapter 3

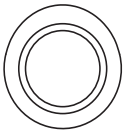
System Interface

3-1 Overview

There are several LEDs on the control panel as well as others on the SATA drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel and an on/off switch on the power supply. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

3-2 Control Panel Buttons

There are three push-buttons located on the front of the chassis: a reset button, a UID button and a power on/off button.

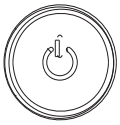


UID

Depressing the UID (unit identifier) button illuminates an LED on both the front and rear of the chassis for easy system location in large stack configurations. The LED will remain on until the button is pushed a second time. Another UID button on the rear of the chassis serves the same function.

Reset

Use the reset button to reboot the system.



Power

The main power button is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC815TQ-R500WB chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

Universal Information LED

When this LED blinks red quickly, it indicates a fan failure and when blinking red slowly a power failure. The LED will be blue when used for UID (Unit Identifier). When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists. See the table below for descriptions of the LED states.

Figure 3-1. Universal Information LED States

Universal Information LED States	
State	Indication
Fast Blinking Red (1x/sec)	Fan Fail
Solid Red	CPU Overheat
Slow Blinking Red (1x/4 sec)	Power Fail
Solid Blue	Local UID Button Depressed
Blinking Blue	IPMI-Activated UID

Note: deactivating the UID LED must be performed in the same way it was activated. (If the UID LED was activated via IPMI, you can only turn the LED off via IPMI and not with the UID button.)

NIC2

Indicates network activity on LAN2 when flashing.

NIC1

Indicates network activity on LAN1 when flashing.

HDD

Indicates IDE channel activity. On the SuperServer 5017R-WRF, this light indicates SATA and/or DVD-ROM drive activity when flashing.

Power

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4 Hard Drive Carrier LEDs

Each hard drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the drive carrier 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:** The red LED indicates two states. When blinking, it indicates the drive is rebuilding. When solid, it indicates a drive failure. If a drive fails, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed drives.

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 5017R-WRF 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 system clean and free of clutter.

- The 5017R-WRF weighs approximately 43/41 lbs (19.5/18.6 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

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

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

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

- After accessing the inside of the system, close the system back up and secure it to the rack unit after ensuring that all connections have been made.

4-3 ESD Precautions

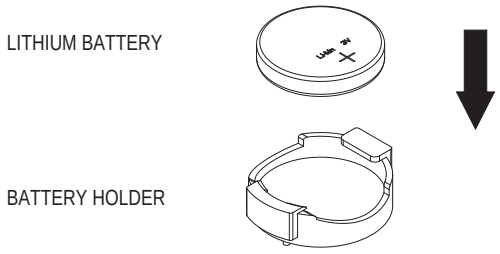
Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient 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 5017R-WRF 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 install processors and heatsinks to the X9SRW-F motherboard, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the motherboard to protect and cool the system sufficiently.

5-1 Handling the Motherboard

Static electrical discharge can damage electronic components. To prevent damage to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the motherboard can cause it to bend if handled improperly, which may result in damage. 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 static discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.

Unpacking

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

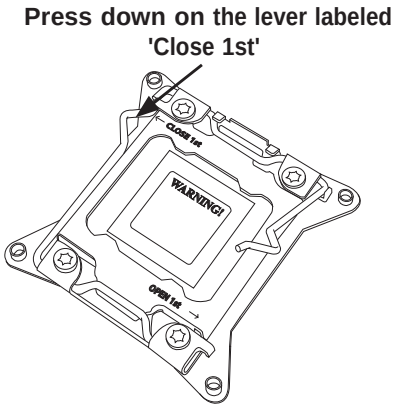
5-2 Processor and Heatsink Installation

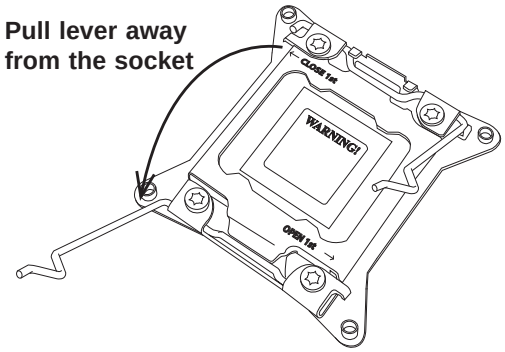
Notes

- 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 LGA2011 Processor

1. There are two levers on the LGA2011 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.



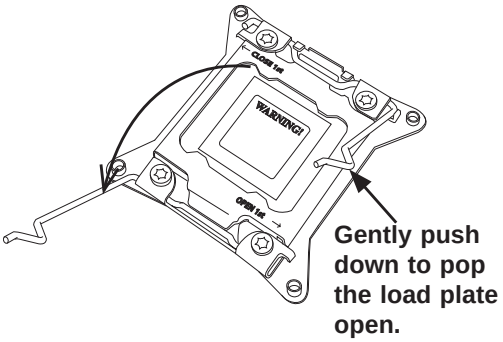


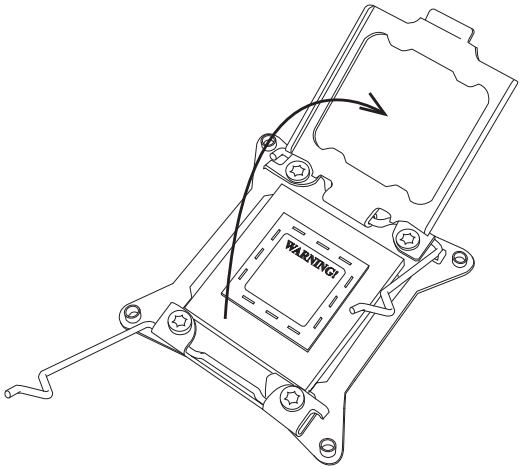
1. With the lever labeled 'Close 1st' fully retracted, gently push down on the 'Open 1st' lever to open the load plate. Lift the load plate to open it completely.

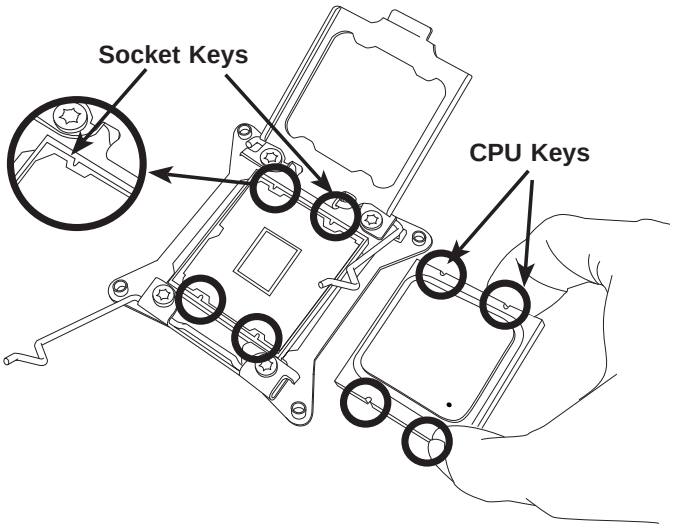
2. Using your thumb and the index finger, remove the 'WARNING' plastic cap from the socket.

3. 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.

4. 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.)



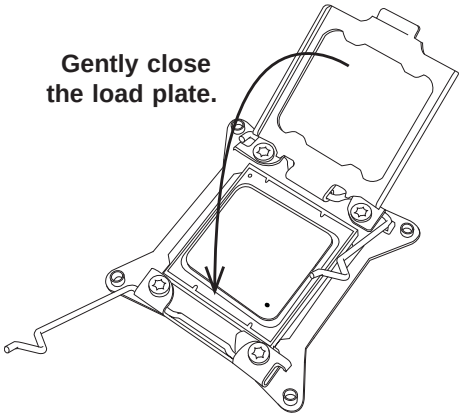


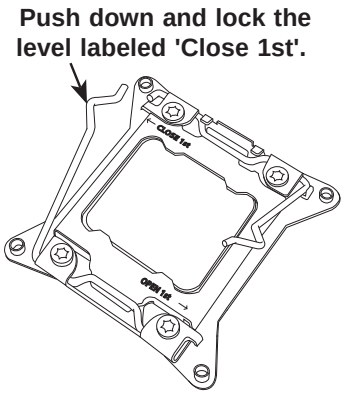


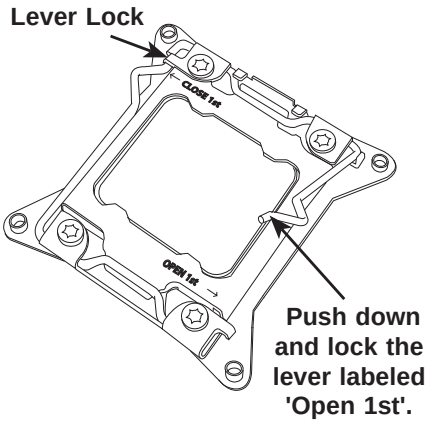
Warning: You can only install the CPU to the socket in one direction. Make sure that the CPU is properly inserted into the socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is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

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

2. 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.





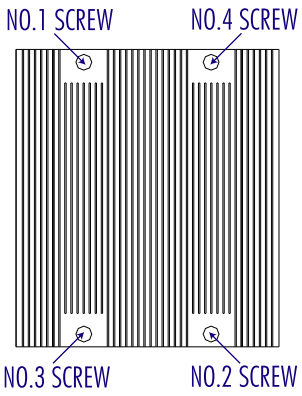


Installing a CPU Heatsink

1. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.

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

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



Removing the Heatsink

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

1. Unplug the power cord from the power supply.

1. Unscrew and remove the heatsink screws in the sequence shown in the picture below.

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

3. Once the heatsink is loosened, remove it from the CPU.

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 before you re-install the heatsink.

5-3 Connecting Cables

Now that the processors are installed, the next step is to connect the cables to the motherboard. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed in preconfigured systems to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to reroute them as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the system, keep the airflow in mind when routing the cables.

The following data cables (with their connector locations noted) should be connected. See the motherboard layout diagram in this chapter for connector locations.

- Control Panel cable (JF1, see next page)
- SATA cables (I-SATA0 ~ I-SATA5 and/or S-SATA1 ~ S-SATA4

Connecting Power Cables

The X9SRW-F has a 24-pin primary power supply connector designated "JPW1" for connection to the ATX power supply. Connect the appropriate connector from the power supply to JPW1 to supply power to the motherboard. See the Connector Definitions section in this chapter for power connector pin definitions.

In addition, your power supply must be connected to the 8-pin Processor Power connector at JPW2.

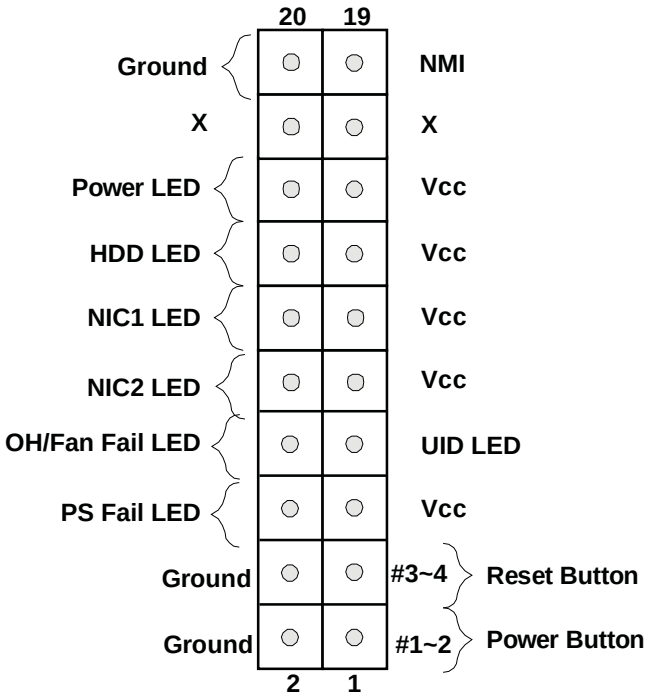
Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators. Even and odd numbered pins are on opposite sides of each header.

All JF1 wires have been bundled into single keyed ribbon cable to simplify their connection. The red wire in the ribbon cable plugs into pin 1 of JF1. Connect the other end of the cable to the Control Panel printed circuit board, located just behind the system status LEDs in the chassis.

See the Connector Definitions section in this chapter for details and pin descriptions of JF1.

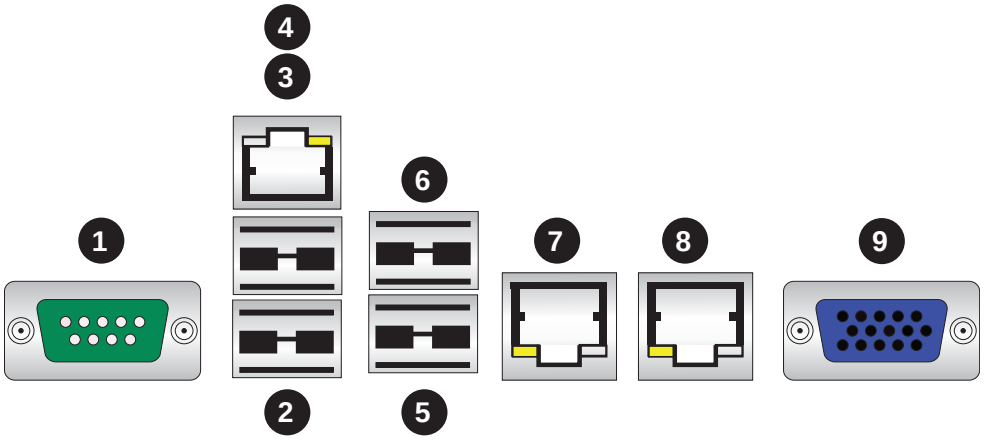
Figure 5-1. Front Control Panel Header Pins (JF1)



5-4 I/O Ports

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

Figure 5-2. Rear Panel I/O Ports



Rear I/O Ports	
1. COM1 Port	6. USB3
2. USB1	7. LAN1 Port
3. USB0	8. LAN2 Port
4. IPMI LAN Port	9. VGA Port
5. USB2	

5-5 Installing Memory

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

CAUTION

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

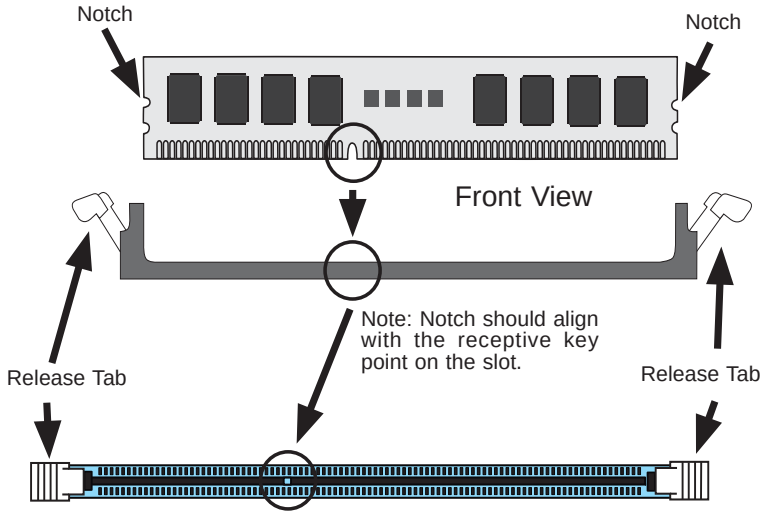
Installing DIMMs

1. Insert the desired number of DIMMs into the memory slots, starting with slot DIMMA1.
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.
3. Align the key on the DIMM module with the receptive point on the slot.
4. Use two thumbs together to press on both ends of the module straight down into the slot until the module snaps into place.
5. Press the release tabs to the lock positions to secure the DIMM module into the slot. See Figure 5-3.

Figure 5-3. Installing DIMM into Slot

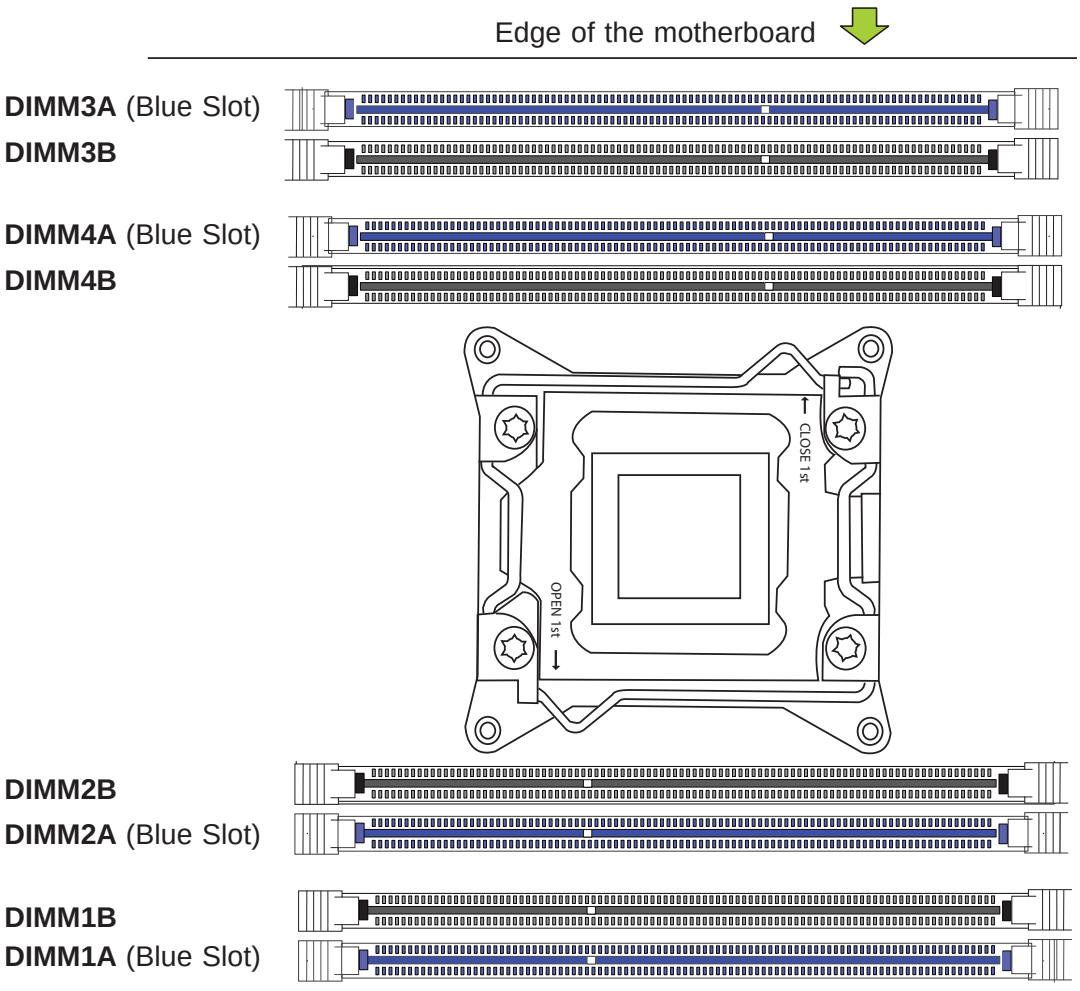
To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

To Remove:
Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.



Memory Support

The X9SRW-F supports up to 256 GB of DDR3-1600/1333/1066 ECC R/LRDIMMs (LRDIMM = Reduced Load DIMMs) or up to 64GB of ECC UDIMMs. Please refer to Chapter 5 for installing memory. Populating these DIMM modules with a pair of memory modules of the same type and same size will result in interleaved memory, which will improve memory performance. Please refer to the table on the next page.



Memory Population Guidelines

When installing memory modules, the DIMM slots should be populated in the following order: DIMM1A, DIMM2A, DIMM3A, DIMM4A then DIMM1B, DIMM2B, DIMM3B, DIMM4B.

- 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 odd-numbered modules installed (1 ,3 ,5 or 7 modules). However, for best memory performance you should install DIMM modules in pairs.

Recommended Population (Balanced)								
DIMM1A	**DIMM2A**	**DIMM3A**	**DIMM4A**	**DIMM1B**	**DIMM2B**	**DIMM3B**	**DIMM4B**	**Total System Memory**
2GB	2GB							4GB
2GB	2GB	2GB	2GB					8GB
2GB	2GB	2GB	2GB	2GB	2GB			12GB
2GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB	16GB
4GB	4GB							8GB
4GB	4GB	4GB	4GB					16GB
4GB	4GB	4GB	4GB	4GB	4GB			24GB
4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB	32GB
8GB	8GB							16GB
8GB	8GB	8GB	8GB					32GB
8GB	8GB	8GB	8GB	8GB	8GB			64GB
8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	128GB
16GB	16GB							32GB
16GB	16GB	16GB	16GB					64GB
16GB	16GB	16GB	16GB	16GB	16GB			96GB
16GB	16GB	16GB	16GB	16GB	16GB	16GB	16GB	128GB
32GB	32GB							64GB
32GB	32GB	32GB	32GB					128GB
32GB	32GB	32GB	32GB	32GB	32GB			192GB
32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	256GB

5-6 Adding PCI Expansion Cards

PCI Expansion Slots

Two riser cards are used to support PCI expansion cards in the system. The RSC-R1UW-E8R riser card can support a PCI-E 3.0 x8 card and the RSC-R1UW-2E16 can support two PCI-E 3.0 x16 cards.

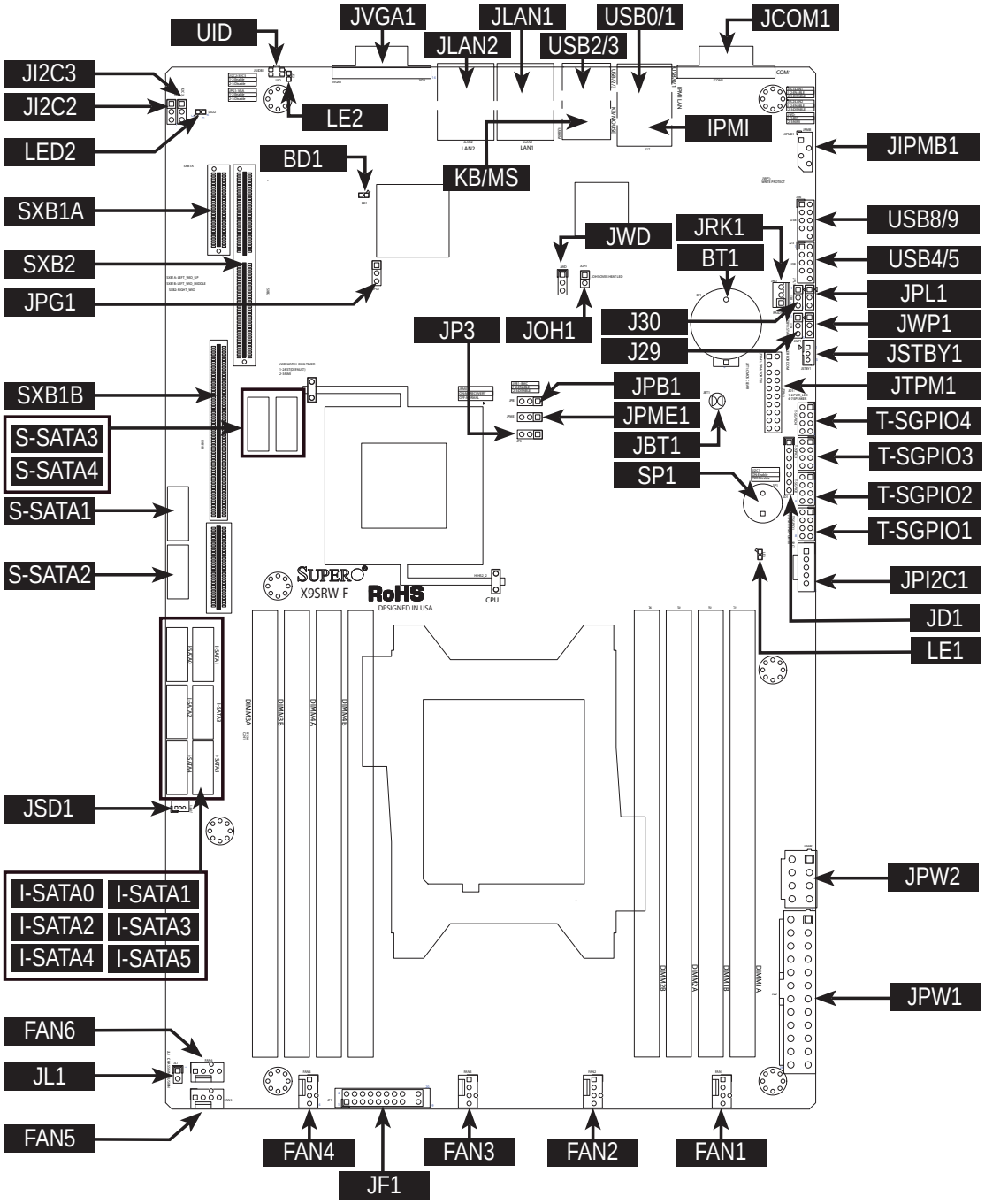
Installing a PCI Add-on Card

1. Release the locking tab that corresponds to the slot you wish to populate.

2. Insert the expansion card into the riser card, pushing down with your thumbs evenly on both sides of the card.

5-7 Motherboard Details

Figure 5-4. SUPER X9SRW-F Layout



X9SRW-F Quick Reference	
Connector	**Description**
S-SATA1 ~ S-SATA4	SCU-based SATA 3.0 ports (6Gb/s)
I-SATA0 ~ I-SATA5	Intel-based SATA ports (I-SATA0 and I-SATA1 = SATA 3.0, S-SATA1~S-SATA4 = SATA 2.0)
FAN1~FAN5	Headers for system cooling fans
JSD1	SATA DOM (Disk On Module) Power Connector
JL1	Chassis Intrusion Header
JF1	Front Panel Control Header
JPW1	24-pin Main ATX Power Connector
JPW2	8-pin Secondary Power Connector
JD1	Power LED / Speaker Header
JPI2C1	Power Supply SMBus I2C Header
T-SGPIO1~4	Serial Link General Purpose I/O Headers
JTPM1	Trusted Platform Module (TPM) Header
JSTBY1	Legacy Wake On LAN Header
USB0/1, USB2/3	Back panel USB 2.0 ports
USB4/5, USB4/5	Internal USB 2.0 headers
JIPMB	System Management Bus Header for the IPMI Slot
JCOM1	Serial Port
IPMI	IPMI LAN Port
JLAN1/JLAN2	LAN1 / LAN2 Ethernet Ports
JVGA1	VGA Port
KB/MS	Combination Keyboard/Mouse Port
JOH1	Overheat LED/Fan Fail
JRK1	RAID Key Firmware upgrade Header
BT1	System Battery
SP1	Internal Speaker / Buzzer
SXB1A, SXB1B	Riser card slot P/N RSC-R2UW-2E16
SXB2	Slot for Supemicro riser card P/N RSC-R2UW-E8R

LED	Description	Color/State	Status
LED2	3.3V Standby Power	Green/Steady	Standby Power
LE1	Power LED	Green/Steady	System On/Running
LE2	UID LED	Blue/Steady	UID Switch On
BD1	IPMI Heartbeat	Green/Blinking	IPMI Enabled

Jumper	Description	Default
JI2C2/JI2C3	SMB to PCI Slots	On (Enabled)
JPG1	Onboard VGA Enable/Disable	Pins 1-2 (On)
JPL1	LAN1/LAN2 Enable/Disable	Pins 1-2 (Enabled)
JPME1	Intel ME Mode Select	Pins 1-2 (Normal)
UID	Unit ID Switch	Off (Disabled)
JWD	Watch Dog Timer Reset	Pins 1-2 (Reset)
JPB1	IPMI/BMC Enable/Disable	Pins 1-2 (Enabled)
JP3	BIOS Recover	Pins 2-3 (Normal)
JWP1	BIOS Write Protect	Pins 1-2 (Normal)
JBT1	CMOS Clear	See Section 5-9
J29	VRM SMB Clock (to BMC or PCH)	Pins 1-2 (BMC, Normal)
J30	VRAM SMB Data (to BMC or PCH)	Pins 1-2 (BMC, Normal)

5-8 Connector Definitions

ATX Power Connector

The 24-pin main power connector (JPW1) is used to provide power to the motherboard. The 8-pin power connector (JPW2) is also required for the processor. These power connectors meet the SSI EPS 12V specification. See the table on the right for pin definitions.

ATX Power 24-pin Connector Pin Definitions (JPW1)

Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Processor Power Connectors

JPW2 and JPW3 must also be connected to the power supply to provide power for the processor(s). See the table on the right for pin definitions.

Processor Power Pin Definitions (JPW2)

Pins	Definition
1 through 4	Ground
5 through 8	+12V

Warning: To prevent damage to your power supply or motherboard, please use a power supply that contains a 20-pin and two 8-pin power connectors. Be sure to connect these power connectors to the 20-pin and the two 8-pin power connectors on your motherboard for adequate power supply to your system. Failure to do so will void the manufacturer warranty on your power supply and motherboard.

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)

Pin#	Definition
19	Control
20	Ground

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)

Pin#	Definition
15	Vcc
16	Control

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a hard drive LED cable to display SATA/ IDE disk activity. Refer to the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	Vcc
14	HD Active

NIC1 LED

The NIC1 (Network Interface Controller) LED connection is located on pins 11 and 12 of JF1. Attach the NIC1 LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)	
Pin#	Definition
11	Vcc
12	Ground

NIC2 LED

The NIC2 (Network Interface Controller) LED connection is located on pins 9 and 10 of JF1. Attach the NIC2 LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)	
Pin#	Definition
9	Vcc
10	Ground

Overheat (OH)/Fan Fail/UID LED

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

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

Power Fail LED

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

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

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)

Pin#	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see the Power Button Mode setting in BIOS). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)

Pin#	Definition
1	PW_ON
2	Ground

Universal Serial Bus Ports

Four USB 2.0 ports are included with the rear I/O ports. There are also four USB 2.0 ports on two headers that can be used to provide front chassis access (see board layout for locations) See the tables on the right for pin definitions.

Front Panel USB Port Header Pin Definitions

Pin #	Definition	Pin #	Definition
1	+5V	2	+5V
3	USB_PN2	4	USB_PN3
5	USB_PP2	6	USB_PP3
7	Ground	8	Ground
9	Key	10	Ground

Rear I/O USB Port Pin Definitions

Pin#	Definition	Pin#	Definition
1	+5V	5	+5V
2	USB_PN1	6	USB_PN0
3	USB_PP1	7	USB_PP0
4	Ground	8	Ground

Chassis Intrusion

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

Chassis Intrusion Pin Definitions

Pin#	Definition
1	Intrusion Input
2	Ground

Speaker (JD1)

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

Speaker Connector Pin Definitions

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

Serial Port

The serial port (COM) is located on the IO backplane. See the table on the right for pin definitions.

Serial Port Pin Definitions

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

Note: NC indicates no connection.

Fan Headers

The X9SRW-F has six headers, designated Fan1 through Fan6. Pins 1-3 of the fan headers are backward compatible with traditional 3-pin fans, but will only run at full speed. Use 4-pin fans to allow the BIOS to automatically set fan speed based on the system temperature (setting in Hardware Monitoring section). See the table on the right for pin definitions.

Fan Header Pin Definitions

Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

Legacy Wake-On-LAN Header (JSTBY)

The onboard LAN ports do not need a WOL header to support their Wake-On-LAN function. Instead, the legacy WOL header was preserved (JSTBY) to provide convenience for some embedded customers who need an internal power source from the board. See the table on the right for pin definitions.

Wake-On-LAN Pin Definitions

Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

Ethernet Ports

Two Ethernet ports (LAN1/LAN2) are located next to the VGA port on the rear I/O.A dedicated IPMI LAN is also located above the USB 0/1 ports to provide a dedicated network connection for IPMI 2.0. These ports accept RJ45 type cables. Please refer to Section 5-10 for LAN LED information.

LAN Ports Pin Definition

Pin#	Definition		
1	TD0-	10	SGND
2	TD0+	11	P3V3SB
3	TD1-	12	Act LED
4	TD1+	13	Link 100 LED (Green, +3V3SB)
5	TD2-	14	Link 1000 LED (Yellow, +3V3SB)
6	TD2+	15	Ground
7	TD3-	16	Ground
8	TD3+	17	Ground
9	P2V5SB	18	Ground

Power SMB (I^2C) Connector

The Power System Management Bus (I^2C) header (JPI^2C) is used to monitor the power supply, fan and system temperatures. See the table on the right for pin definitions.

PWR SMB Pin Definitions (JPI^2C)

Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	+3.3V

DOM PWR Connector

The Disk-On-Module (DOM) power connector, located at JSD1, provides 5V (Gen1/Gen) power to a solid-state DOM storage device connected to one of the SATA ports. See the table on the right for pin definitions.

DOM PWR Pin Definitions

Pin#	Definition
1	5V
2	Ground
3	Ground

Overheat/Fan Fail LED

The JOH1 header is used to connect an LED to provide warnings of chassis overheat. This LED will also blink to indicate a fan failure. Refer to the table on right for pin definitions.

Overheat LED Pin Definitions

Pin#	Definition
1	5vDC
2	OH Active

OH/Fan Fail LED Pin Definitions

State	Message
Solid	Overheat
Blinking	Fan Fail

IPMB I²C

A System Management Bus header for the IPMI slot is located at IPMB. Connect the appropriate cable here to use the IPMB I²C connection on your system.

IPMB I²C Pin Definitions (IPMB)

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

T-SGPIO 1/2 & 3-SGPIO 1/2 Headers

Two T-SGPIO (Serial-Link General Purpose Input/Output) headers are located next to the I-SATA ports on the motherboard. Additionally, two 3-SGPIO ports are also located next to USB 8/9. These headers are used to communicate with the enclosure management chip in the system. See the table on the right for pin definitions.

Serial_Link-SGPIO Pin Definitions

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

Note: NC indicates no connection.

TPM Header

This header is used to connect to a Trusted Platform Module (TPM), which is available from third-party vendors. A TPM is a security device that supports encryption and authentication in 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.

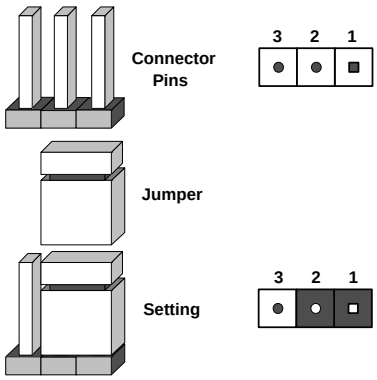
Trusted Platform Module Header Pin Definitions

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

5-9 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the diagram at right for an example of jumping pins 1 and 2. Refer to the motherboard layout page for jumper locations.



Note: On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

CMOS Clear

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

To clear CMOS

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

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

VGA Enable/Disable

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

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

LAN Enable/Disable

Change the setting of jumper JPL1 to enable or disable the onboard Ethernet (RJ45) ports LAN1 and LAN2. See the table on the right for jumper settings. The default setting is enabled.

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

Watch Dog Enable/Disable

JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application "hangs". Pins 1-2 will cause WD to reset the system if an application hangs. Pins 2-3 will generate a non-maskable interrupt signal for the application that has hung. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Note: When enabled, the user needs to write their own application software to disable the Watch Dog Timer.

Watch Dog Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

VGA Enable/Disable

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

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

PCI Slot SMB Enable

Use jumpers JI^{2}C2/JI^{2}C3 to enable PCI SMB (System Management Bus) support to improve system management for the PCI slots. See the table on the right for jumper settings.

PCI Slot SMB Enable Jumper Settings	
Jumper Setting	Definition
Short (Default)	Enabled
Open	Disabled

BIOS Recovery

The BIOS Recovery jumper (JP3) is used to enable or disable the BIOS recovery feature of the motherboard. Install the jumper on pins 1-2 to begin the recovery process.

BIOS Recovery Jumper Settings

Pin#	Definition
1	Recover
2	Ground
3	Normal (Default)

ME Recovery

ME Recovery (JPME1) is used to enable or disable the ME Recovery feature of the motherboard. This jumper will reset Intel ME values back to their default settings.

ME Recovery Jumper Settings

Pin#	Definition
1	Normal (Default)
2	Ground
3	Force Update

VRM SMB Clock/Data

The VRM SMB Clock/Data is used to select where the Voltage Regulator Module's System Management Bus clock signal (J29) or Data (J30) is directed to. Select between BMC or PCH.

VRM SMB Clock/Data Pin Definitions

Pin#	Definition
1	BMC (Default)
2	SMBCLK / SMBDAT
3	PCH

BMC Enable/Disable

JPB1 is used to enable or disable the BMC (Baseboard Management Control) chip and the onboard IPMI connection. This jumper is used together with the IPMI settings in the BIOS. See the table on the right for jumper settings.

BMC IPMI Enable/Disable Jumper Settings

Settings	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

BIOS Recovery

The BIOS Recovery (JP3) is used to enable or disable the BIOS Recovery feature of the motherboard. Install the jumper on pins 1-2 to begin the recovery process.

BIOS Recovery Pin Definitions

Pin#	Definition
1	Recover
2	Ground
3	Normal (Default)

ME Recovery

ME Recovery (JPME1) is used to enable or disable the ME Recovery feature of the motherboard. This jumper will reset Intel ME values back to their default settings.

ME Recovery Pin Definitions

Pin#	Definition
1	Normal (Default)
2	Ground
3	Force Update

VRM SMB Clock/Data

The VRM SMB Clock/Data is used to select where the Voltage Regulator Module's System Management Bus clock signal (J29) or Data (J30) is directed to. Select between BMC or PCH.

VRM SMB Clock/Data Pin Definitions

Pin#	Definition
1	BMC (Default)
2	SMBCLK / SMBDAT
3	PCH

5-10 Onboard Indicators

LAN Port LEDs

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

LAN LED Connection Speed Indicator	
LED Color	Definition
Off	No connection or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

IPMI_Dedicated LAN LEDs

In addition to LAN1 and LAN2, the X9SRW-F has an IPMI_Dedicated LAN located on the IO backpanel. The amber LED indicates activity, while the Link LED may be green, amber or off to indicate the speed of the connection. See the table above for more information.

LE1

An Onboard Power LED is located at LE1 on the motherboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the tables at right for more information.

Onboard PWR LED Indicator	
LED Color	Definition
Off	System Off/Power cable not connected
Green	System On
Green: Flashing Quickly	ACPI S1 State
Green: Flashing Slowly	ACPI S3 State

IPMI Heartbeat LED

When blinking, the IPMI Heartbeat LED (BD1) indicates the IPMI feature is functioning properly. Refer to the table on the right for details.

IPMI Heartbeat LED Indicator	
Status	Definition
Blinking Green	IPMI is ready for use

Rear Unit ID LED

The rear Unit ID LED (LE2) is located on the back panel. This LED is used in conjunction with the rear UID switch to provide easy identification of a system that might be in need of service.

Rear UID LED Indicator	
Status	Definition
Solid Blue	UID Toggled On

Onboard Standby Power LED

An onboard Standby Power LED (LED2) indicates that the AC power cable is connected and the power supply switch is on. Make sure to disconnect the power cable before removing or installing non hot-swap components.

Onboard Standby Power LED Indicator	
Status	Definition
Off	Power Supply is Off (Hard Switch)
On	Power Supply is On (Hard Switch).

5-11 SATA Ports

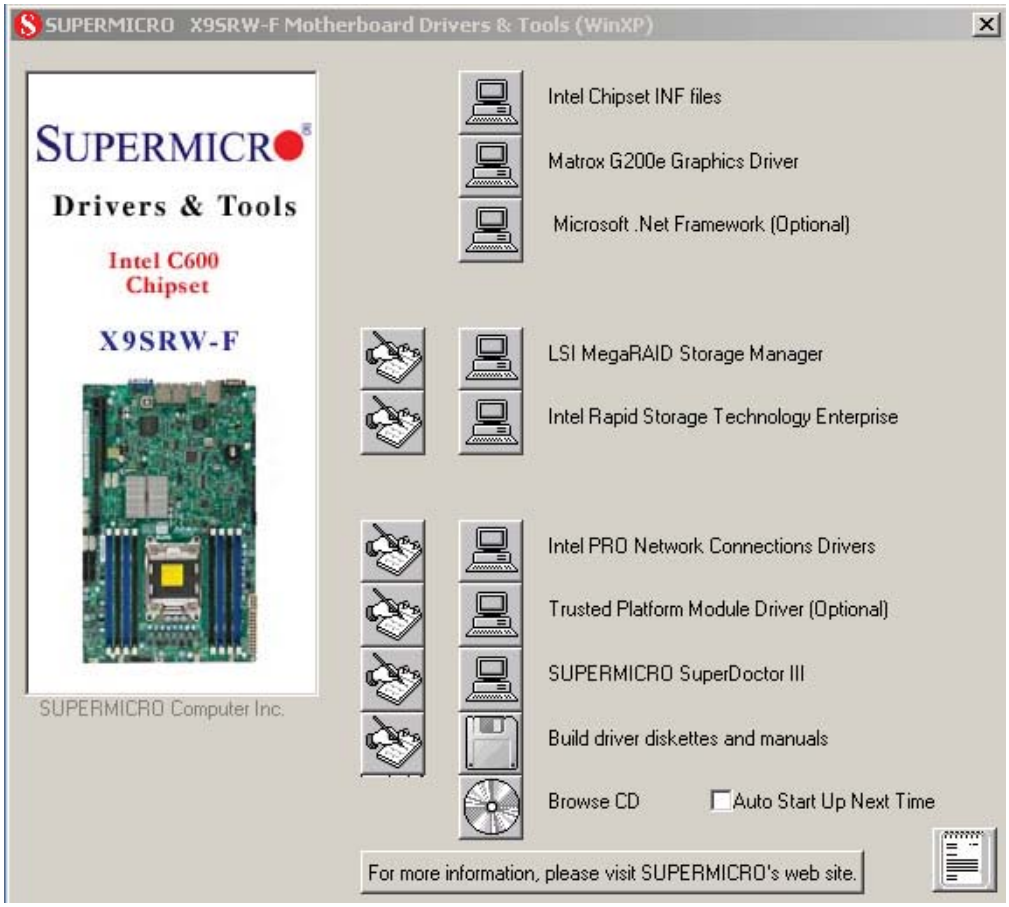
SATA Ports

The X9SRW-F includes a total of 10 SATA ports. I-SATA0 ~ 5 on the motherboard includes two SATA 3.0 ports (I-SATA0 and I-SATA1, which have white connector). An additional SATA controller provides four more SATA 2.0 ports (S-SATA1 ~ 4).

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

5-12 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.

SuperDoctor III

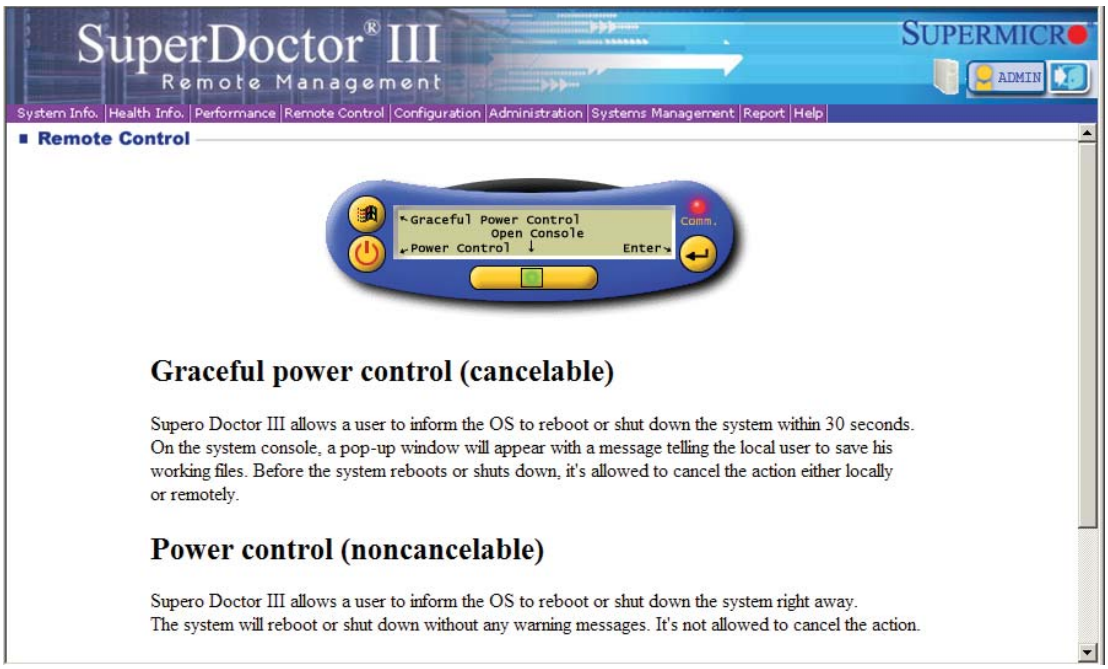
The SuperDoctor® III program is a Web base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The SuperDoctor III program included on the CD-ROM that came with your motherboard allows you to monitor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

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

Note: When SuperDoctor 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 SuperDoctor, as the SuperDoctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor.

SuperDoctor III Interface Display Screen (Health Information)

SuperDoctor III Interface Display Screen (Remote Control)



Note: The SuperDoctor III program and User's Manual can be downloaded from the Supermicro web site at http://www.supermicro.com/products/accessories/software/SuperDoctorIII.cfm.

For Linux, we recommend using SuperDoctor II.

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC815TQ-R500WB 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 next step.

Tools Required: The only tool you will need to install components and perform maintenance is a Philips screwdriver.

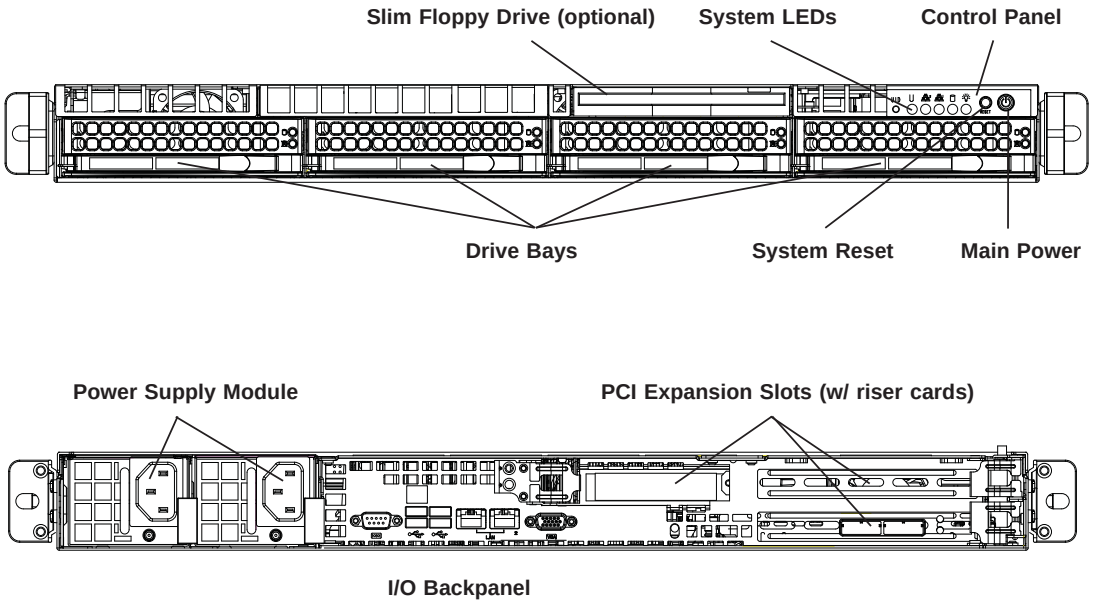
6-1 Static-Sensitive Devices

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.

Figure 6-1. Chassis: Front and Rear Views



6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the motherboard to provide you with system status indications. These wires have been bundled together as a ribbon cable to simplify the connection.

Connect the cable from JF1 on the motherboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF1 can be found in "Chapter 5: Advanced Motherboard Setup."

6-3 System Fans

Four 4-cm heavy duty counter-rotating fans provide the cooling for the SuperServer 5017R-WRF. Each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels. It is very important that the chassis top cover is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fan will ramp up to full speed and the overheat/fan fail LED on the control panel will turn on. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

Remove the top chassis cover while the system is still running to determine which of the two fans has failed. Then power down the system before replacing a fan. Removing the power cords is also recommended as a safety precaution.

Replacing System Fans

1. After determining which fan has failed, turn off the power to the system.

2. Unplug the fan cable from the motherboard and remove the failed blower fan from the chassis.

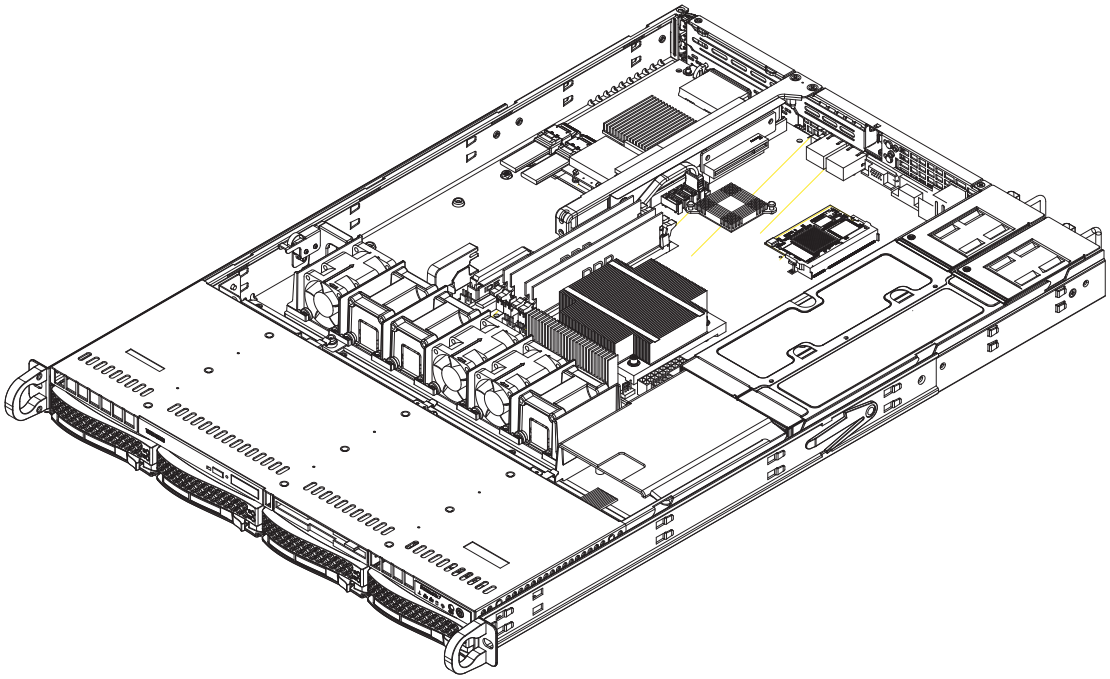
3. Replace the failed fan with an identical 4-cm, 12 volt fan (available from Supermicro).

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

5. Reposition the fan housing back over the two mounting posts in the chassis, then reconnect the fan wires to the same chassis fan headers you removed them from.

6. Power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the chassis cover.

Figure 6-2. System Cooling Fans

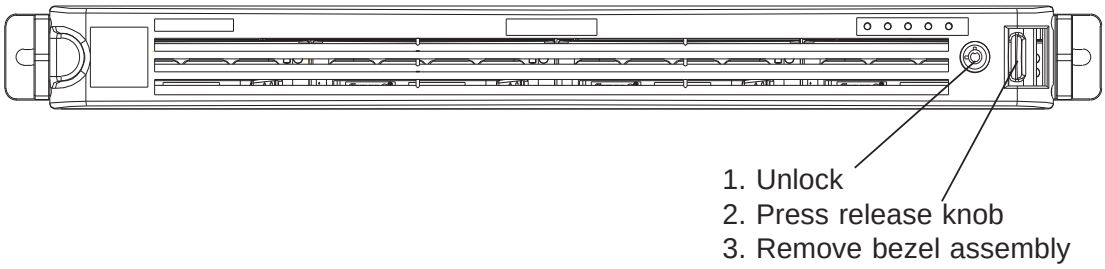


6-4 Drive Bay Installation/Removal

Removing the Front Bezel

If your system has a front bezel (optional) attached to the chassis, you must first remove it to gain access to the drive bays. To remove the bezel, first unlock the front of the chassis then press the release knob (see Figure 6-3). Carefully remove the bezel with both hands. A filter located within the bezel can be removed for replacement/cleaning. It is recommended that you keep a maintenance log of filter cleaning/replacement, since its condition will affect the airflow throughout the whole system.

Figure 6-3. Removing the Front Bezel



Accessing the Drive Bays

SATA Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace SATA drives. Proceed to the next section for instructions.

DVD-ROM/Floppy Disk Drives: For installing/removing a DVD-ROM or floppy disk drive, you will need to gain access to the inside of the 5017R-WRF by removing the top cover of the chassis. Proceed to the "DVD-ROM and Floppy Drive Installation" section later in this chapter for instructions.

Note: Only "slim" DVD-ROM and floppy drives will fit into the 5017R-WRF.

Hard Drive Installation

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

Mounting a Hard Drive in a Drive Carrier

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

2. Secure the drive to the carrier with six screws, as shown in Figure 6-4.

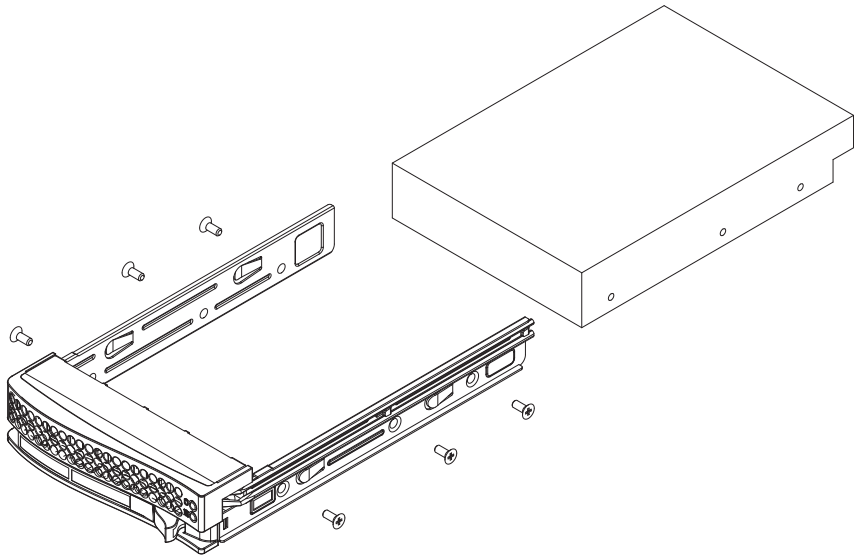


Figure 6-4. Mounting a Hard Drive in a Carrier

Use caution when working around the SATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.

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

Installing/Removing a Hard Drive

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

2. Swing the colored handle fully out and use it to pull the unit straight out (see Figure 6-5).

Note: Your operating system must have RAID support to enable the hot-plug capability of the hard drives.

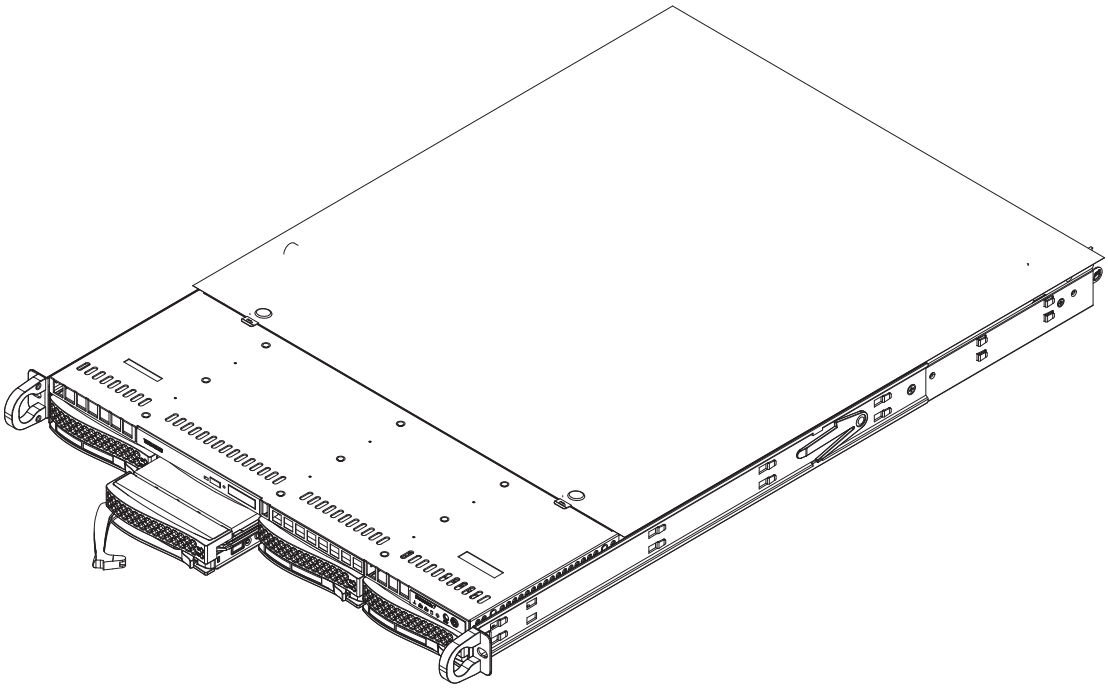


Figure 6-5. Removing a Hard Drive from the Server

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

DVD-ROM and Floppy Drive Installation

The top cover of the chassis must be opened to gain full access to the DVD-ROM and floppy drive bays. The 5017R-WRF accomodates only slim-line DVD-ROM drives. Side mounting brackets are needed to mount a slim-line DVD-ROM drive in the 5017R-WRF server. You must power down the system before installing or removing a floppy or DVD-ROM drive.

Removing the Chassis Cover

1. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").

2. Depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

Removing/Installing a Drive

1. With the chassis cover removed, unplug the power and data cables from the drive you want to remove.

2. Locate the locking tab at the rear of the drive. It will be on the left side of the drive when viewed from the front of the chassis.

3. Pull the tab away from the drive and push the drive unit out the front of the chassis.

4. Add a new drive by following this procedure in reverse order. You may hear a faint *click* of the locking tab when the drive is fully inserted.

5. Remember to reconnect the data and power cables to the drive before replacing the chassis cover and restoring power to the system.

Please be aware of the following:

- The floppy disk drive cable has seven twisted wires.

- A color mark on a cable typically designates the location of pin 1.

- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always

connects to drive A, and the connector that does not have twisted wires always connects to drive B.

6-5 Power Supply

The SuperServer 5017R-WRF has a 500 watt redundant power supply configuration consisting of two hot-swap power modules. The power supply modules have an auto-switching capability, which enables them to automatically sense and operate with a 100V - 240V input voltage.

Power Supply Failure

If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption. The Universal Information LED on the control panel will blink slowly and remain so until the failed module has been replaced. Replacement modules can be ordered directly from Supermicro (see contact information in the Preface). The power supply modules have a hot-swap capability, meaning you can replace the failed module without powering down the system.

Replacing the Power Supply

You do not need to shut down the system to replace a power supply module. The redundant feature will keep the system up and running while you replace the failed hot-swap module. Replace with the same model, which can be ordered directly from Supermicro (see Contact Information in the Preface).

1. First unplug the power cord from the failed power supply module.

2. To remove the failed power module, push the release tab (on the back of the power supply) to the side and then pull the module straight out (see Figure 6-6).

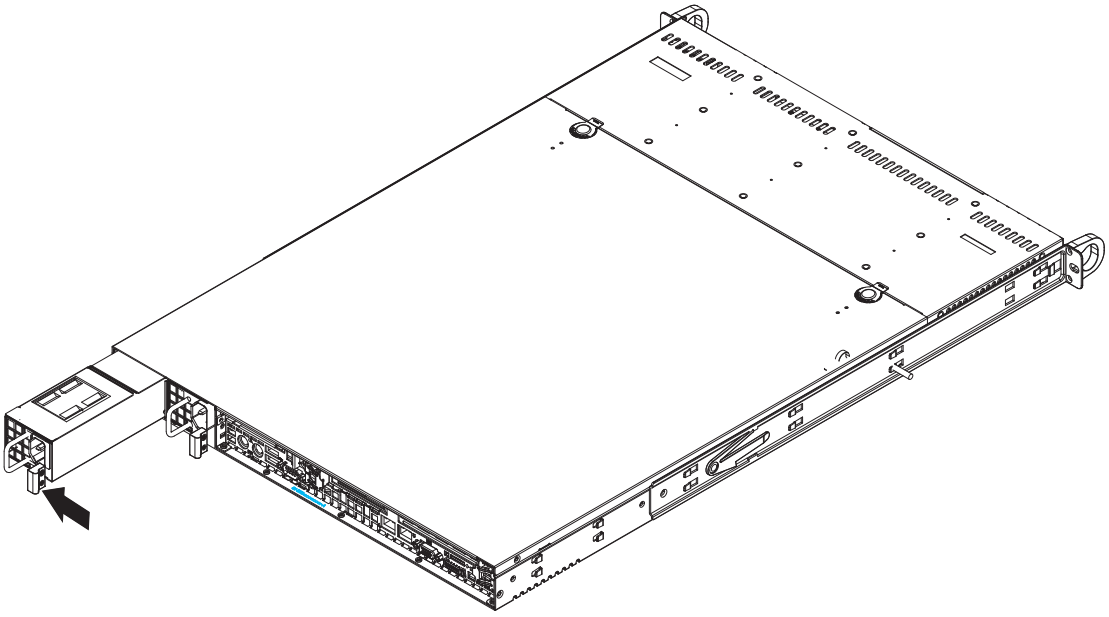
3. The power supply wiring was designed to detach automatically when the module is pulled from the chassis.

4. Replace the failed power module with another PWS-651-1R power supply module.

5. Simply push the new power supply module into the power bay until you hear a click.

6. Finish by plugging the AC power cord back into the new power module.

Figure 6-6. Removing/Replacing the Power Supply



Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X9SRW 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. SAS features are not included on the X9SRW.

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

Starting BIOS Setup Utility

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

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

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

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

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

How To Change the Configuration Data

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

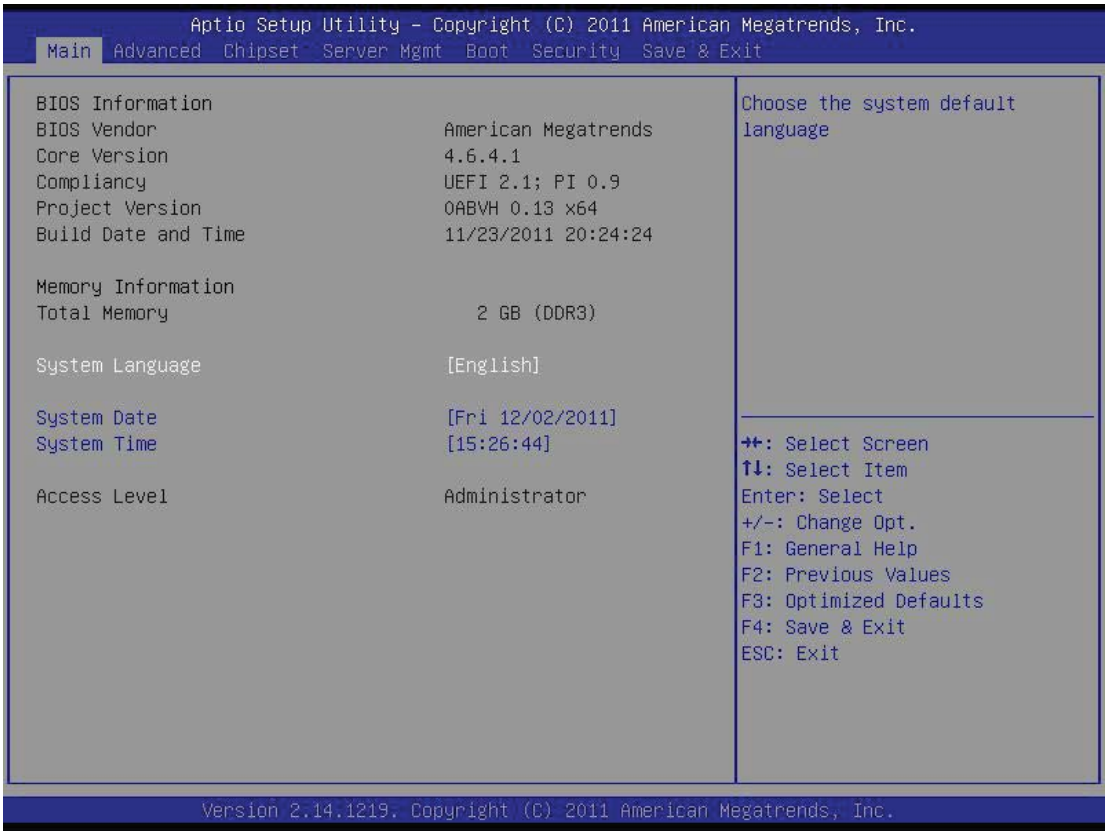
How to Start the Setup Utility

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

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

7-2 Main Setup

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



The AMI BIOS main menu displays the following information:

BIOS Information

BIOS Vendor

This item displays the name of the BIOS vendor.

Core Version

This item displays the core version of the BIOS.

Compliancy

This item displays the compliance information of the BIOS.

Project Version

This item displays the version number of the project.

Build Date and Time

This item displays the day and time when this version of BIOS was built.

SMC Version

This item displays the SMC Version of the BIOS used in th system.

Memory Information

Total Memory

This displays the amount of memory that is available in the system.

System Language

This item displays the language used in the system.

System Date

This item displays th system date in Day MM/DD/YY format (e.g. 10/12/2011).

System Time

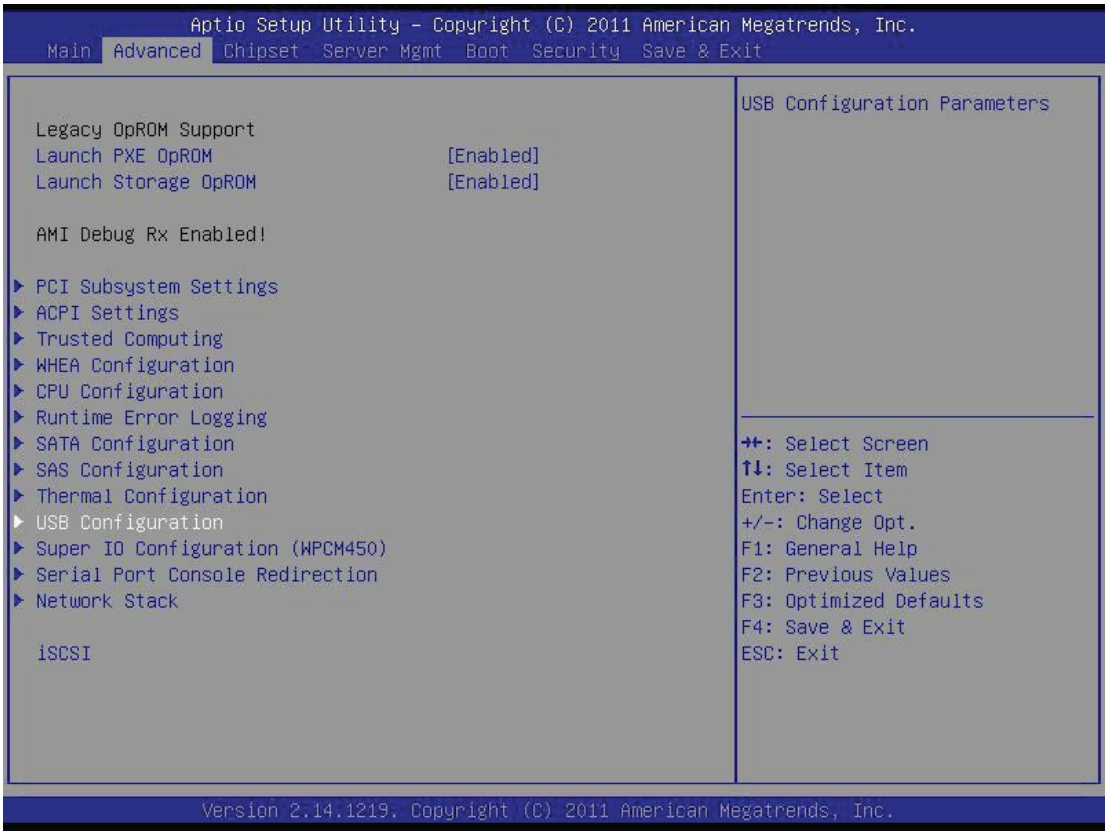
This item displays the system time in HH:MM:SS format (e.g. 15:32:52).

Access Level

This item displays the access level of the user who can access the setup utility.

7-3 Advanced Setup Configurations

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



Legacy OpROM Support

Launch PXE OpROM

The options are **Enabled** and Disabled.

Launch Storage OpROM

The options are **Enabled** and Disabled.

▶PCI Subsystem Settings

PCI Bus Driver Version

This item displays the current driver version.

PCI Option ROM Handling

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 bit Resource Handling

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**.

PCI Common Settings

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.

VGA Palette Snoop

Select Enabled to inform the onboard PCI devices that an ISA graphics device is installed in the system in order for the graphics card to function properly. 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**.

▶PCI Express Settings

Relaxed Ordering

Select Enabled to allow certain PCI-E transactions to violate the strict ordering rules of PCI-E so that a transaction can be completed before other transactions that have already been queued in order to enhance PCI-E performance. The options are **Disabled** and Enabled.

Extended Tag

The options are **Disabled** and Enabled.

No Snoop

The options are Disabled and **Enabled**.

Maximum Payload

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

Extended Synch

Select Enabled for Extended Synchronization support, which will extend the same synchronization capability for the PCI-E device. The options are **Disabled** and Enabled.

Link Training Retry

This feature allows the user to decide how many attempts a software program can make before time-out for the program. The default setting is 5. The options are Disabled, 2, 3, and **5**.

Link Training Timeout (US)

This feature allows the user to decide how many microseconds a software program should wait before polling the 'Link Training' bit in the Link Status Register. Enter the desired microsecond setting (from 10 to 1000). The default setting is **100**.

Unpopulated Links

Select Disable Link to disable the unpopulated PCI-E links (connections) to save power. The options are **Keep Link ON** and Disable Link.

▶PCI Express GEN 2 Settings

Completion Timeout

This feature allows the system to modify the Completion Timeout value for a device that supports Completion Timeout Programmability. The default setting is between 50us and 50ms. If Shorter is selected, software will use a shorter timeout range supported by the device. If Longer is selected, software will use a

longer timeout range supported by the device. The options are **Default**, Shorter, Longer, and Disabled.

ARI (Alternative Routing-ID Interpretation) Forwarding (Available if supported by a device)

If this feature is set to Enabled, Downstream PCI-E ports do not force the Device Number=0 restriction. If this feature is set to Disabled, ARI Downstream Ports, ID-based Routing is performed per the existing PCI-E Specification. The options are **Disabled** and Enabled.

AtomicOp Requester Enable (Available if supported by a device)

If this feature is set to Enabled, and is supported by the device, a hardware device that supports this feature will initiate Atomic Operation requests, provided that the Bus Master Enable bit is in the Command Register Set. The options are **Disabled** and Enabled.

AtomicOp Egress Blocking (Available if supported by a device)

If this feature is set to Enabled, and is supported by the device, any outbound automatic opeation requests via Egress (Exiting) ports wil be blocked. The options are **Disabled** and Enabled.

IDO (ID-Based Ordering) Request Enable (Available if supported by a device)

If this feature is set to Enabled and is supported by the device, ID-Based Ordering provides the oppourtunity for independent request streams to bypass another congested stream to enhance performance. The options are **Disabled** and Enabled.

IDO (ID-Based Ordering) Completion Enable (Available if supported by a device)

If this feature is set to Enabled and is supported by the device, a computer is allowed to set the ID-Based Ordering if the IDO Completion Enable bit in the Device Control 2 Register is set. The options are **Disabled** and Enabled.

LTR Mechanism Enable (Available if supported by a device)

The PXI-E Latency Tolerance Reporting (LTR) is an extended PCI-E capability that will allow software to provide platform latency information to upstream connection components (such as endpoints and switches). This feature is required if the device suports LTR. If this feature is set to Enabled and is supported by the device, the Latency Tolerance Reporting mechanism will be enabled. The options are **Disabled** and Enabled.

End-End TLP Prefix Blocking (Available if supported by a device)

If this feature is set to Enabled and is supported by the device, TLP forwarding that contains End-End TLP prefixes will be blocked. The options are **Disabled** and Enabled.

Target Link Speed

The options are **Auto**, Force to 2.5 GT/s, and Force to 5.0 GT/s

Clock Power Management

If this feature is enabled and is supported by the device, CLKREQ# signals can be used for Link Clock power management according to the protocol defined in the specification. The options are **Disabled** and Enabled.

Compliance SOS

Select Enabled to force the Link Training and Status State Machine (LTSSM) to send SKP (Sketch Up Documents) Ordered sets between sequences when sending or modifying the compliance pattern, proveded that this feature is supported by the device. The options are **Disabled** and Enabled.

Hardware Autonomous Width

Select Disabled to disable hardware's ability to change PCI-E link width (except width reduction) to correct operational errors if this feature is supported by the device. The options are Disabled and **Enabled**.

Hardware Autonomous Speed

Select Disabled to disable hardware's ability to change PCI-E link speed (except reducing the speed) to correct operational errors if this feature is supported by the device. The options are Disabled and **Enabled**.

▶ACPI Settings

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

Enable ACPI Auto Configuration

Select Enabled for BIOS ACPI Auto Configurtion support which will allow the BIOS to automatically set Advanced Configuration and Power Interface configuration depending on the devices installed in the system. The options are **Disabled** and Enabled.

Enable Hibernation

Select Enabled to enable hibernation support, which is OS/S4 sleep state. The options are **Enabled** and Disabled.

ACPI Sleep State

Use this feature to select the ACPI State when the system is in sleep mode. Select S1 (CPU Stop Clock) to erase all CPU caches and stop executing instructions. Power to the CPU(s) and RAM is maintained, but RAM is refreshed. Select Suspend to use power-reduced mode. Power will only be supplied to limited components (such as RAMs) to maintain the most critical functions of the system. The options are **S1 (CPU Stop Clock)** and Suspend Disabled.

Lock Legacy Resources

Select Enabled to lock legacy resources to enhance system performance. The options are Enabled and **Disabled**.

▶Trusted Computing

Configuration

TPM Support

Select Enabled on this item and enable the TPM jumper on the motherboard to allow TPM support to improve data integrity and network security. The options are **Enabled** and Disabled.

TPM State

Select Enabled to enable TPM security settings to improve data integrity and network security. The options are **Disabled** and Enabled.

Pending Operation: This item displays the status of a pending operation.

Current Status Information: This item displays the information regarding the current TPM status.

TPM Enable Status

This item displays the status of TPM Support to indicate if TPM is currently enabled or disabled.

TPM Active Status

This item displays the status of TPM Support to indicate if TPM is currently active or deactivated.

TPM Owner Status

This item displays the status of TPM Ownership.

▶WHEA Configuration

WHEA Support

Select Enabled to enable Windows Hardware Error Architecture (WHEA) support which will provide a common infrastructure for the system to handle hardware errors on the Windows OS platforms in order to reduce system crashes due to hardware errors and to enhance system recovery and health monitoring. The default setting is **Enabled**.

▶CPU Configuration

This submenu displays the information of the CPU as detected by the BIOS. It also allows the user to configure CPU settings.

▶CPU Information

This submenu displays the following information regarding the CPU installed.

- Type of CPU
- CPU Signature
- Microcode Patch
- Maximum CPU Speed
- Minimum CPU Speed
- Processor Cores
- Intel HT(Hyper-Threading) Technology
- Intel VT-x (Virtualization) Technology
- L1 Data Cache
- L1 Code Cache
- L2 Cache
- L3 Cache

CPU Speed

This item displays if a CPU is installed.

64-bit

This item indicates if the CPU installed supports 64-bit technology.

Hyper-threading

Select Enabled to support Intel Hyper-threading Technology to enhance CPU performance. 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, 3, 4, 5, 6 and 7.

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.)

Hardware Prefetcher (Available when supported by the CPU)

If set to Enabled, the hardware 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**.

Adjacent Cache Line 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 option is set to Enabled the CPU fetches both cache lines for 128 bytes as comprised. The options are Disabled and **Enabled**.

DCU Streamer Prefetcher (Available when supported by the CPU)

Select Enabled to support Data Cache Unite (DCU) prefetch to speed up data accessing and processing in the DCU to enhance CPU performance. The options are Disabled and **Enabled**.

DCU IP Prefetcher (Available when supported by the CPU)

The options are **Enabled** and Disabled.

Intel® Virtualization Technology

Select Enabled to support Intel Virtualization Technology, whch will 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 website for detailed information.

Clock Spread Spectrum

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

▶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.**

P-STATE Coordination

This feature selects the type of coordination for the P-State of the processor. P-State is a processor operational state that reduces the processor's voltage and frequency. This makes the processor more energy effiicient, resulting in further gains. The options are **HW_ALL**, SW_ALL and SW-ANY.

CPU C3 Report, CPU C6 Report, CPU C7 Report

This BIOS feature enables or disables C3, C6, and C7 reporting to the operating system. The options for C3 are **Disabled** and Enabled. The options for C6 and C7 are Disabled and **Enabled**.

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, C1, C6, C7, and No Limit.

Energy Performance

The options are Performance, **Balanced Performance**, Balanced Energy, and Energy Efficient.

Factory Long Druation Power Limit

This item displays the power limit set by the manufacturer during which long duration power is maintained.

Long Duration Power Limit

This item displays the power limit set by the manufacturer during which long duration power is maintained.

Factory Long Duration Maintained

This item displays the period of time set by the manufacturer during which long duration power is maintained.

Long Duration Maintained

This item displays the period of time during which long duration power is maintained.

Recommended Short Duration Power

This item displays the short duration power settings recommended by the manufacturer.

Short Duration Power Limit

This item displays the period of time during which short duration power is maintained.

▶Runtime Error Logging

Runtime Error Logging Support

Select Enabled to support Runtime Error Logging. The options are Enabled and **Disabled**.

If Enabled is selected, the following items appear:

Memory Corr. Error Logging Support

This feature allows the user to enter the threshold value for correctable memory errors. The default setting is **10**.

PCI Error Logging Support

Select Enabled to support error event logging for PCI Slots. The options are Enabled and **Disabled**.

Poison Support

Select Enabled for Poison support. The options are Enabled and **Disabled**.

▶SATA Configuration

When this submenu is slected, the AMI BIOS automatically detects the presence of IDE or SATA devices and displays the following items.

SATA Port0~SATA Port5

The AMI BIOS displays the status of each SATA port as detected by the BIOS.

SATA Mode

Use this feature to configure SATA mode for a selected SATA port. 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 (SATA) Controller 0~1

Use this feature to activate or dactivate the SATA controller, and set the compatibility mode. The options for Controller 0 are Enhanced and **Compatible**. The default setting for SATA Controller 1 is **Enhanced**.

AHCI Mode

The following items are displayed when the AHCI Mode is selected:

Aggressive Link Power Management

Select Enabled to enable Aggressive Link Power Management to support Cougar Point B0 stepping and beyond. The options are **Enabled** and Disabled.

Port 0~Port 5 Hot Plug

Select Enabled to enable hot-plug support for a port specified by the user so that the user is allowed to change a hardware component or a device without shutting down the system. The options are Enabled and **Disabled**.

External SATA Port 0~5

Select Enabled to enable Extended SATA Port 0 ~ Port 5 support. The options are Enabled and **Disabled**.

Staggered Spin-up

Select Enabled to enable Staggered Spin-up support to prevent excessive power consumption caused by multiple HDDs spinning-up simultaneously. The options are Enabled and **Disabled**.

RAID Mode

The following items are displayed when RAID Mode is selected:

Port 0~5 Hot Plug

Select Enabled to enable hot-plug support for a port specified by the user. The options are Enabled and **Disabled**.

▶SAS Configuration

If a SAS port is detected in the system, the following items will be displayed.

OnChip SAS Oprom

Select Enabled to support the onboard SAS Option ROM to boot up the system via a storage device if a SAS device is installed.

SAS Option ROM Codebase

Select Intel to use the Intel SAS controller to support onboard SAS Option ROM. Select LSI to use the LSI SAS controller to support onboard SAS Option ROM.

Device0~Device7: The AMI BIOS will automatically detect the onboard SAS devices and display the status of each SAS device as detected.

▶Thermal Configuration

Thermal Management

Select Enabled to initialize the PCH Thermal subsystem device located at D31:F6. The options are Enabled and **Disabled**. If Enabled is selected, the following item appears:

ME SMBus Thermal Reporting

Select Enabled to support ME SMBus (Management Engine System Management Bus) reporting. The options are Enabled and **Disabled**.

▶USB Configuration

Legacy USB Support

Select Enabled to support legacy USB debvices. Select Auto to disable legacy support if USB devices are not present. Select Disable to have USB devices available for EFI (Extensive Firmware Interface) applicatioins only. The options are **Enabled,** Disabled and Auto.

EHCI Hand-off

Select Enabled to enable support for operating systems that do not support Enhanced Host Controller Interface (EHCI) hand-off. When enabled, EHCI ownership change will be claimed by the EHCI driver. The options are **Disabled** and Enabled.

Port 60/64 Emulation

Select Enabled to enable I/O port 60h/64h emulation support for the legacy USB keyboard so that it can be fully supported by the operating systems that do not recognize a USB device. The options are Disabled and **Enabled**.

USB Hardware Delays and Time-outs

USB Transfer Time-out

Use this item to set the time-out value for control, bulk, and interrupt transfers. The options are 1 second, 5 seconds, 10 seconds, and **20 seconds**.

Device Reset Time-out

Use this item to set the time-out value for the BIOS to detect USB mass storage devices installed in the system. The options are 10 seconds, **20 seconds**, 30 seconds, and 40 seconds.

Device Power-up Delay

Use this item to set the maximum time a device will wait before it properly reports to the host controller. Select Auto to use the default setting. The options are **Auto** and Manual.

▶Super IO Configuration (WPCM450)

Super IO Chip

Displays the Super IO chip type.

▶Serial Port 0 Configuration/Serial Port 1 Configuration

The submenus allow the user to configure the following settings for Serial Port 0 or Serial Port 1:

Serial Port

Select Enabled to enable a serial port specified by the user. The options are **Enabled** and Disabled.

Serial Port Mode

The options are **SOL** and COM.

Device Settings

This feature indicates whether or not a reset is required for a serial port specified.

Change Settings

Use this feature to set the optimal Platform Environment Control Interface (PECI) setting for a serial port specified. The default setting is **Auto**, which will allow the AMI BIOS to automatically select the best setting for the PECI platform.

Device Mode

Use this feature to select the desired mode for a serial port specified. The options are Normal and High Speed.

▶ME (Management Engine) Updates

ME Updates

Select Enabled to update ME settings. The options are **Enabled** and Disabled.

▶Serial Port Console Redirection

These submenus allow the user to configure the following Console Redirection settings for a COM Port 0 or COM Port 1 as specified by the user.

COM 0/COM 1

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 COM0 is **Disabled**, and for COM1 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. Selet 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)

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 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 Stob 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.

Out-of-Band-Mgmt Port

Use this feature to select the port for out-of-band management. The options are **COM0** and COM1

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.

▶Network Stack

Network Stack

Select Enabled to enabel PXE (Preboot Execution Environment) or UEFI (Unified Extensible Firmware Interface) for network stack support. The options are Enabled and **Disable Link**.

iSCSI

This item displays the following iSCSI information:

iSCSI Initiation Name: This item displays the name of the iSCSI Initiator, which is a unique name used in the world.

▶Port 00-25-90-58-50-E2

This submenu displays the following information.

Enable iSCSI

Select Enabled to enable iSCSI support. The options are **Disabled** and Enabled.

Enable DHCP

Select Enabled to enable Dynamic Host Configuration Protocol (DHCP) support, which will allow the BIOS to search for a DHCP server in the network to find the available IP address for this computer. The options are **Disabled** and Enabled.

If set to disabled, the following items will be displayed:

- Initiator IP Address
- Initiator Subnet Mask
- Gateway

Target Name

- Target IP Address
- Target Port
- Boot LUN

CHAP Type

Use this item to select CHAP type. The options are **None**, One Way, and Mutual. If the item 'Enable DHCP' is set to Enabled, the following items will be displayed:

Get Target Information via DHCP

Select Enabled to get target information via DHCP. The options are **Disabled** and Enabled.

- Target Name
- Target IP Address
- Target Port
- Boot LUN

▶Save Changes

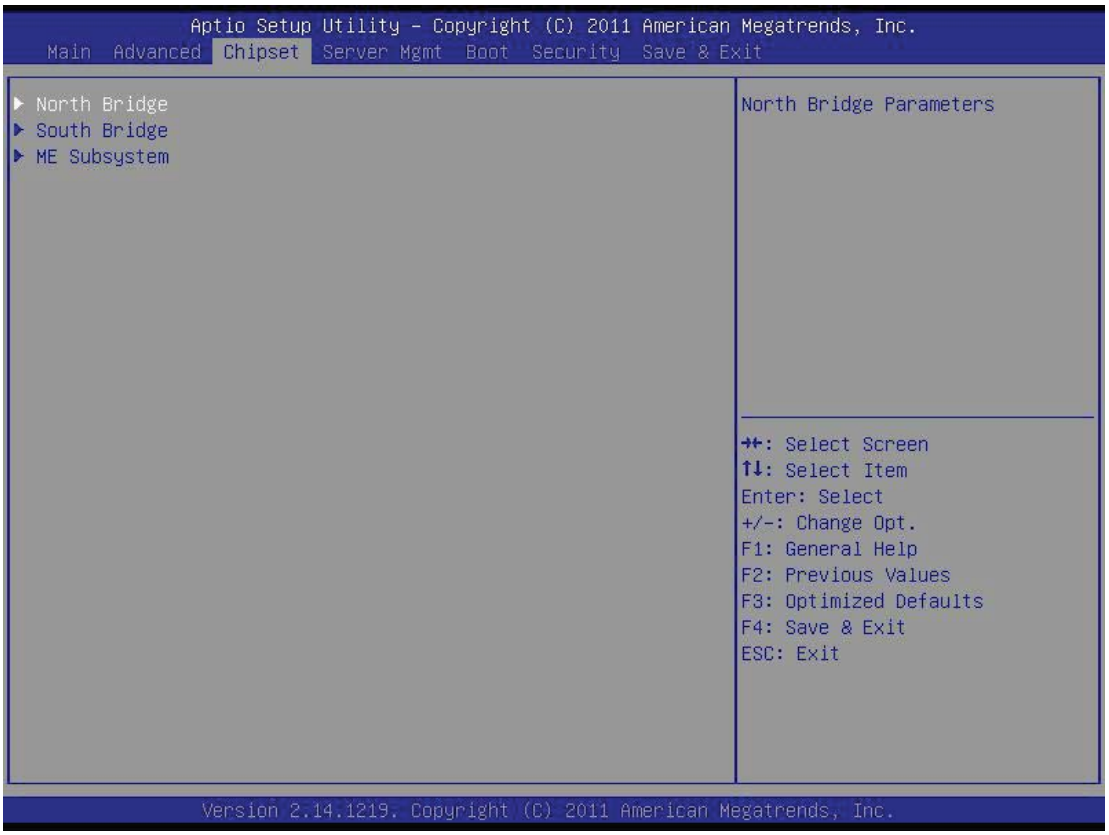
Select this item and press <Enter> to save the changes.

▶Back to Previous Page

Select this item and press <Enter> to return to the previous page.

7-4 Chipset Configuration Settings

Use the arrow keys to select Chipset and display the following submenu items.



▶North Bridge

This feature allows the user to configure the settings for the Intel North Bridge.

▶IOH (IO Hub) Configuration

▶Intel® VT for Directed I/O Configuration

Intel VT-d

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

If Enabled is selected, the following items appear:

Interrupt Remapping

The options are Disabled and **Enabled**.

Coherency Support

The options are **Disabled** and Enabled.

ATS Support

The options are Disabled and **Enabled**.

Pass-through DMA

The options are Disabled and **Enabled**.

Intel® I/OAT

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

DCA Support

Select Enabled to use Intel's DCA (Direct Cache Access) Technolgy to improve data transfer efficiency. The options are **Enabled** and Disabled.

VGA Priority

Use this feature to specify which graphics controller to be used as the primary boot device. The options are **Onboard** and Offboard (VGA).

Target VGA

IOH Resource Selection Type

Select Auto to automatically allocate PCI resources across multiple IO hubs based on PCI devices detected. The options are **Auto** and Manual.

MMIOH (Memory Mapped IO High) Size

This feature allows the user to set high memory mapped I/O range which is located above the main memory. This region is used to map I/O address requirements above 4-G range. The options are 1G, 2G, 3G, 4G, 8G, 16G, 32G, **64G**, and 128G.

Io Ratio Skt0 (Available when IOH Resource Selection Type is set to Manual)

The default setting is **3**.

Mmio Ratio Skt0 (Available when IOH Resource Selection Type is set to Manual)

The default setting is **6**.

IOH PCIe Port Bifuracation Control

This submenu allows the user to configure the following 10 PCIe Port Bifurcation Control settings for the IOH 0/IOH 1 PCI-Exp ports. This feature determines how to distribute the available PCI-Express lanes to the PCI-E Root Ports.

IOU1-PCIe Port

This feature allows the user to set the PCI-Exp bus speed between IOU1 and PCI-e port. The options are x4x4 and **x8**.

Port A Link Speed

Select GEN1 to enable PCI-Exp Generation 1 support for Port 1A. Select GEN2 to enable PCI-Exp Generation 2 support for Port 1A. The options are GEN1, and **GEN2**.

IOU2 - PCIe Port

This feature allows the user to set the PCI-Exp bus speed between IOU2 and PCIe port. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16, and **Auto**.

IOU3 - PCIe Port

This feature allows the user to set the PCI-Exp bus speed between IOU3 and PCIe port. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16, and **Auto**.

Compatibility RID

Select Enabled to support Compatibility Revision ID (CRID) as specified in the Sandybridge BIOS Specifications. The options are **Enabled** and Disabled.

Memory Configuration

- **Total Memory**: This item displays the total memory size available in the system.
- **Current Memory Mode**: This item displays the current memory mode.
- **Current Memory Speed**: This item displays the current memory speed.
- **Mirroring**: This item displays if memory mirroring is supported by the motherboard.
- **Sparing**: This item displays if memory sparing can be supported by the motherboard.

Memory Mode

When Independent is selected, all DIMMs are available to the operating system. When Mirroring is selected, the motherboard maintains two identical copies of all data in memory for data backup. When Lockstep is selected, the motherboard uses two areas of memory to run the same set of operations in parallel. The options are **Independent**, Mirroring, Lockstep and Sparing.

DDR Speed

Use this feature to force a DDR3 memory module to run at a frequency other than what the system is specified in the specification. The options are **Auto**, Force DDR3-800, Force DDR3-1066, Force DDR3-1333, Force DOR3-1600 and Force 1866.

Channel Interleaving

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

Rank Interleaving

This feature allows the user to select a rank memory interleaving method. 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 IO hub 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 IO hub 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

Select Enabled to enable data scrubbing and ensure data security and integrity. The options are **Disabled** and Enabled.

Device Tagging

Select Enabled to support device tagging. The options are **Disabled** and Enabled.

Rank Margin

Select Enabled to set the memory rank margin setting. The options are **Disabled** and Enabled.

Thermal Throttling

Throttling improves reliability and reduces power consumption in the processor via automatic voltage control during processor idle states. The options are Disabled **CLTT** (Closed Loop Thermal Throttling), and OLTT (Open Loop Thermal Throttling).

OLTT Peak BW %

Use this feature to set a percentage of the peak bandwidth allowed for OLTT. Enter a number between 25 to 100 (%).The default setting is **50**, Maximum.

Altitude

Use this to set the altitude of the operating environment for the system as indicated by the number of meters above the sea level. The options are Auto, **300 M** (Meters), 900 M, 1500 M, and 3000 M.

Serial Message Debug Level

This feature allows the user to select the serial message debug level. The options are **Minimum**, Maximum, Trace, and Memory Training.

▶DIMM Information

CPU DIMM Information

DIMM A1, A2, B1, B2, C1, C2, D1, D2

The status of the memory modules specified above will be displayed as detected by the BIOS.

▶South Bridge

This feature allows the user to configure the settings for the Intel PCH chip.

PCH Information

This feature displays the following PCH information.

- **Name**: This item displays the name of the PCH chip.
- **Stepping**: This item displays the status of the PCH stepping.

SB (South Bridge) Chipset Configuration

PCH Compatibility RID

Select Enabled to enable Compatibly Revision ID (CRID) support which will modify the chipset's PCI identifiers for compatibility reasons. The options are **Disabled** and Enabled.

Restore AC Power Loss

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

SLP_S4 Assertion Stretch Enable

Select Enabled to support the assertion stretch width of the SLP _S4# signal to maximize power safe cycles for DRAMs. The options are Disabled and **Enabled**.

SLP_S4 Assertion Width

This item sets the minimum assertion width of the SLP _S4# signal to ensure that DRAMs' power cycles are safe. The options are 1-2 seconds, 2-3 seconds, 3-4 seconds, and **4-5 seconds**.

Deep Sx

Use this item to configure Deep S4/S5 (Sx) settings for power support. For mobile devices, Deep Sx is supported in DC only. For desktop platforms, Sx is supported in AC only. The options are **Disabled**, Enabled in S5 (Battery), Enabled in S5, Enabled in S4 & S5 (Battery), and Enabled in S4 & S5.

Disable SCU Devices

Select Enabled to enable support for Patsburg SCU (System Configuration Utility) devices. The options are **Disabled** and Enabled.

Onboard SAS Oprom

Select Enabled to support Onboard SAS Option ROM which will allow the system to boot-up through onboard SAS connections. The options are **Disabled** and Enabled.

Onboard SATA RAID Oprom

Select Enabled to support Onboard SATA RAID Option ROM which will allow the system to bootup through onboard SATA RAID devices via network connections. The options are **Enabled** and Disabled.

High Precision Event Timer Configuration

High Precision Timer

Select Enabled to activate the High Precision 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, 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.

▶PCI Express Ports Configuration

PCI Express Port 1~8

The options are Enabled, Disabled, and **Auto**.

PCIe Sub Decode

The options are Enabled and **Disabled**.

DMI Vc1/Vcp/Vcm Control

The options are **Enabled** and Disabled.

▶USB (Universal Serial Bus) Configuration

All USB Devices

Select Enabled to enable all onboard USB devices. The options are **Enabled** and Disabled.

EHCI Controller 1/ EHCI Controller 2

Select Enabled to enable Enhanced Host Interface (EHCI) Controller 1 or Controller 2 to improve overall platform performance. The options are **Enabled** and Disabled.

USB Port 0~USB Port 13

Select Enabled to enable a USB port (from USB Port 0 to USB Port 13) as specified by the User. The options are **Enabled** and Disabled.

▶ME (Management Engine) Subsystem

Intel ME Subsystem Configuration

This feature displays the following ME Subsystem Configuration settings.

ME Subsystem

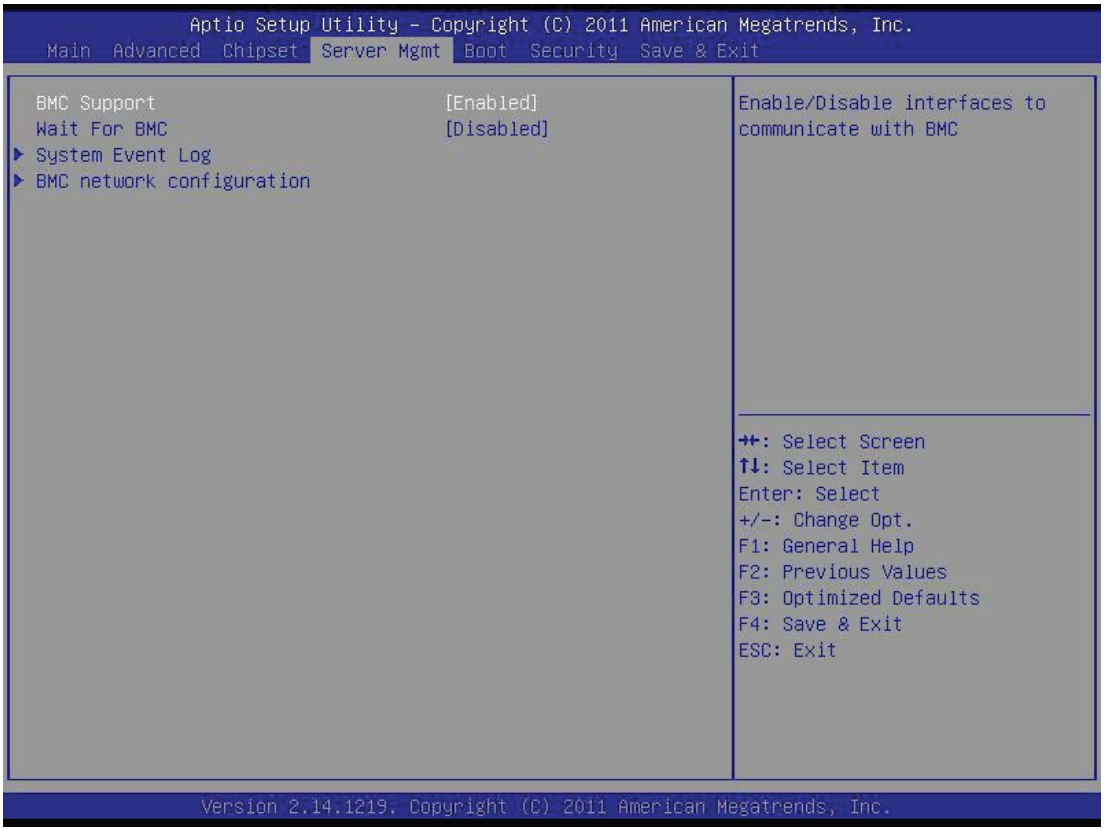
Select Enabled to support Intel Management Engine (ME) Subsystem, a small power computer subsystem that performs various tasks in the background. The options are **Enabled** and Disabled.

When ME Subsystem is enabled, the following items will display.

- **ME BIOS Interface**
- **ME Version**
- **ME FW (Firmware) Status Value**
- **ME FW (Firmware) State**
- **ME FW (Firmware) Operation State**
- **ME FW (Firmware) Error Code**
- **ME Ext. (Extended) FW (Firmware) Status Value**
- **BIOS Booting Mode**
- **Cores Disabled**
- **ME FW (Firmware) SKU Information**

7-5 Server Management

Use this feature to configure Server Management settings.



BMC Support

Select Enabled to enable the BMC (Baseboard Management Controller). The options are **Enabled** and Disabled.

Wait for BMC

Select Enabled for the system to wait for the host controller to initiate and to interface with the BMC at bootup. The options are **Disabled** and Enabled.

▶System Event Log

Enabling/Disabling Options

SEL Components

Select Enabled for all system event logging at bootup. The options are Enabled and **Disabled**.

Erasing Settings

Erase SEL

Select 'Yes, On next reset' to erase all system event logs upon next system reboot. Select 'Yes, On every reset' to erase all system event logs upon each system reboot. Select No to keep all system event logs after each system reboot. The options are **No**, Yes, On next reset, and Yes, On every reset.

When SEL is Full

This feature allows the user to decide what the BIOS should do when the system event log is full. Select Erase Immediately to erase all events in the log when the system event log is full. The options are **Do Nothing** and Erase Immediately.

Cstom EFI Logging Options

Log EFI Status Codes

Select Enabled to log EFI (Extensible Firmware Interface) Status Codes, Error Codes or Progress Codes. The options are Disabled, **Both**, Error code, and Progress code.

Note: After making changes on a setting, be sure to reboot the system for the changes to take effect.

▶BMC Network Configuration

LAN Channel 1/LAN Channel 2: This feature allows th user to configure the settings for LAN Channel 1 or LAN Channel 2.

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 Address Source

This feature allows the user to select the source of the IP address for this computer. If Static is selected, you will need to know the IP address of this computer and enter it to the system manually in the field. If Unspecified is selected, the BIOS will search the next available IP address for this computer without modifying BMC network parameters. The options for LAN Channel 1 are Static and **Dynamic-Obtained by BMC**. The options for LAN Channel 2 are **Unspecified**, Static, Dynamic-Obtained by BMC, Dynamic-Loaded by BIOS, and Dynamic-BMC Running Other Protocol. If Unspecified is selected, the following items are assigned IP addresses automatically.

Station IP Address

This item displays the Station IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

Subnet Mask

This item displays the sub-network that this computer belongs to. The value of each three-digit number separated by dots should not exceed 255.

Station MAC Address

This item displays the Station Mac address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

Router IP Address

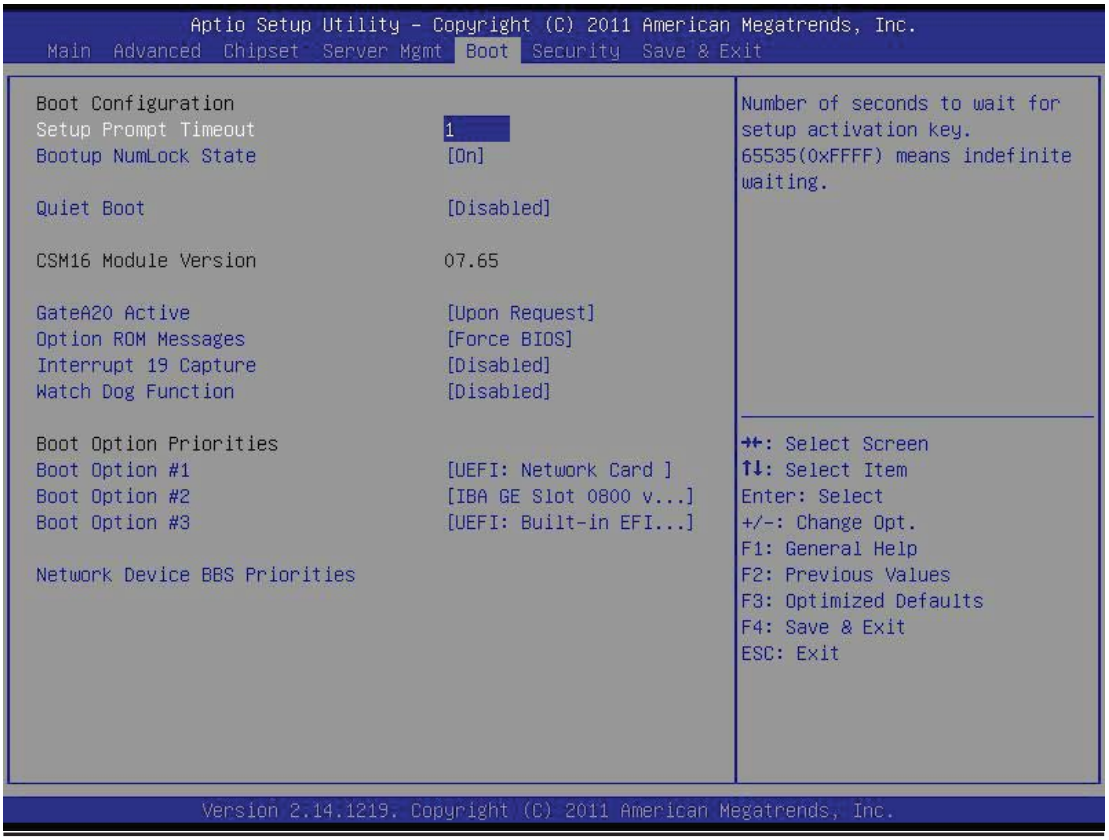
This item displays the Router IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

Router MAC Address

This item displays the Router Mac address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

7-6 Boot

This submenu allows the user to configure the following boot settings for the system.



Boot Configuration

Setup Prompt Timeout

This item allows the user to specify the number of seconds the system should wait before the setup is initiated. The default setting is **1**.

Boot NumLock State

Use this feature to set the Power-on state for the Numlock key. The options are Off and **On**.

Quiet Boot

Set this value to allow the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to allow the computer system to display the POST messages. Select Enabled to allow the computer system to display the OEM logo. The default setting is **Disabled**.

CSM16 Module Version: This item displays the version of the CSM16 Module.

GateA20 Active

Select Always to keep Gate 20 enabled all the time, which will be beneficial when RT (Real Time) code is executed above 1 MB. The options are **Upon Request** and Always.

Option ROM Messages

This item allows the user to decide how the Option ROM Message is displayed. Select Keep Current to use the current Option ROM Message Display setting. Select Force BIOS to use the Option ROM display mode set by the system BIOS. The options are **Force BIOS** and Keep Current.

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 reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

Boot Option Priorities

Boot Option #1/ Boot Option #2/ Boot Option #3

This item allows the user to select the first boot device. Select a LAN device to boot the system from the network connection. Select UEFI to boot the system from the UEFI: Built-in EFI Shell. The options are UEFI: Network Card, IBA GE Slot 0700 v1371, UEFI: Built-in EFI Shell, and Disabled. The default setting for the first boot drive is **UEFI: Network Card**. The default setting for the second boot drive is **IBA GE Slot 0700 v1371**. The default setting for the third boot drive is **UEFI: Built-in EFI Shell**.

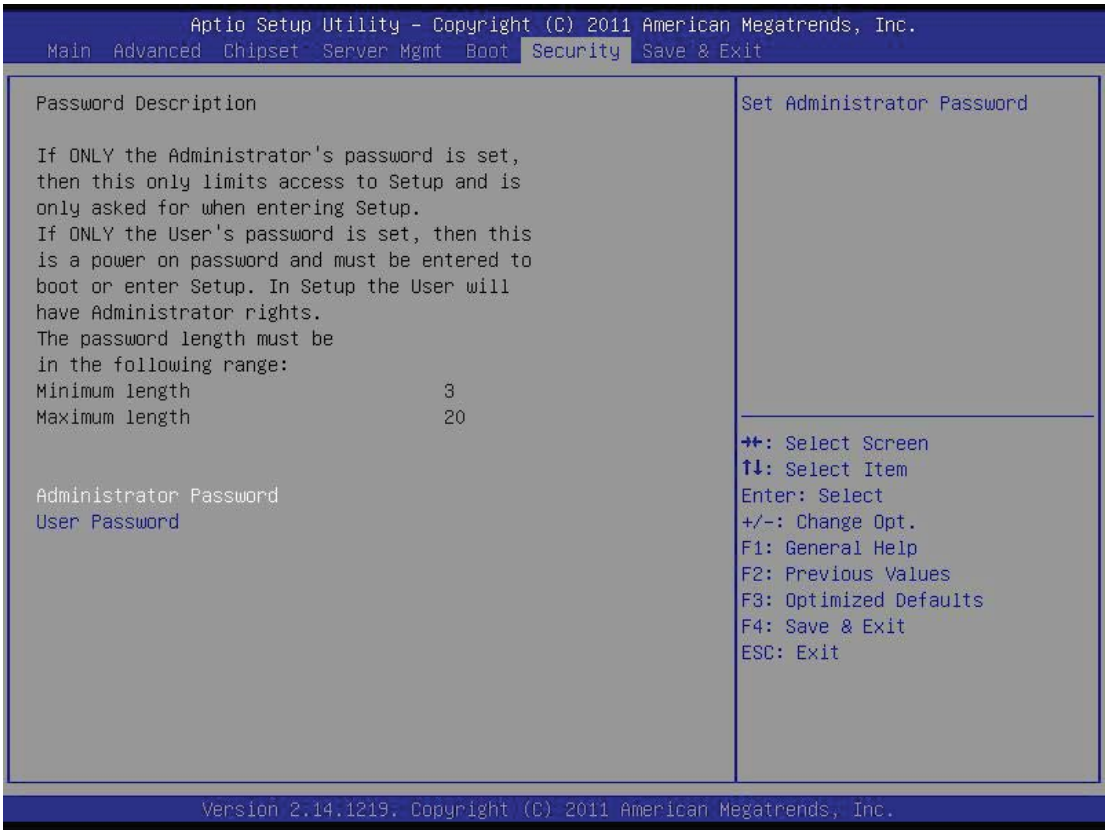
Network Device BBS Priorities

Boot Option #1

This item allows the user to select the first boot drive. Select a LAN device to boot the system from the network connection. The options are **IBA GE Slot 0700 v1371** and Disabled.

7-7 Security

This menu allows the user to configure the following security settings for the system.



Administrator Password

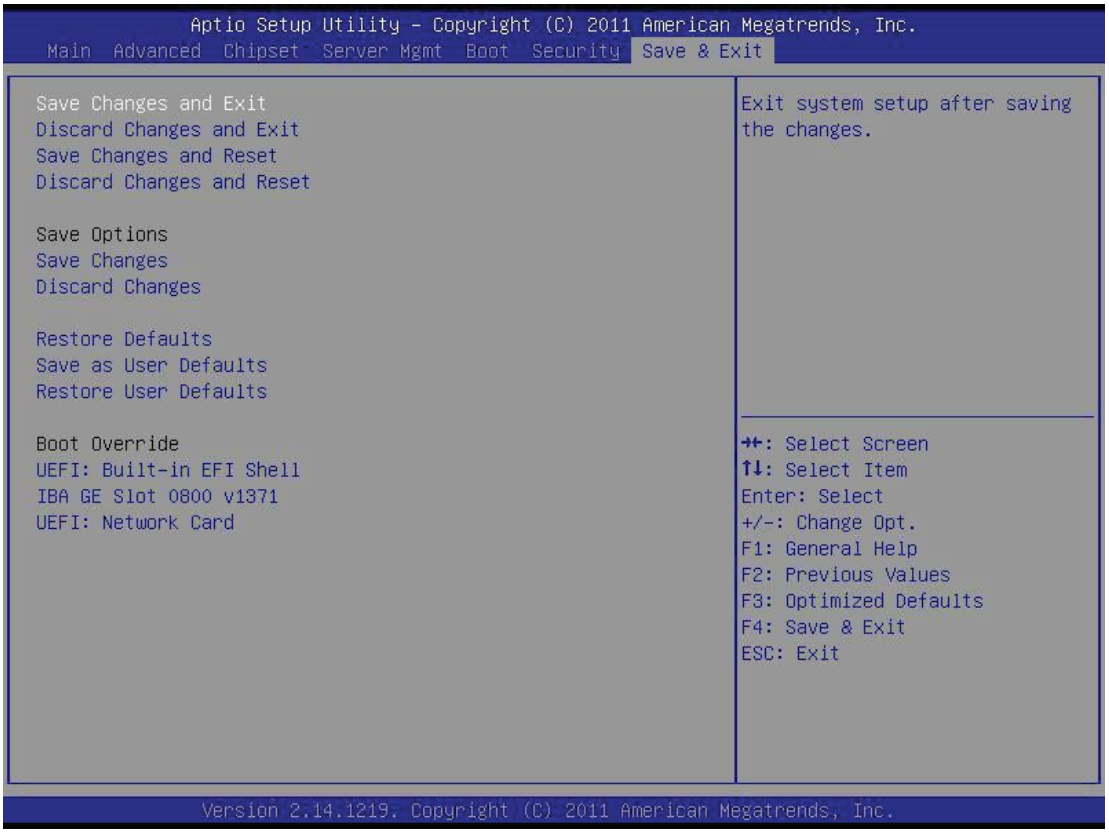
Use this feature to set the Administrator Password which is required to enter the BIOS setup utility. The length of the password should be from 3-characters to 8-characters long.

User Password

Use this feature to set a User Password which is required to log into the system and to enter the BIOS setup utility. The length of the password should be from 3-characters to 8-characters long.

7-8 Save & Exit

This submenu allows the user to configure the Save and Exit settings for the system.



Save Changes and Exit

Select this option to save changes and exit the system setup. Select Save Changes and Exit from the Exit menu and press <Enter>. When the dialog box appears, asking you if you want to Save configuration and exit, select **Yes** to save changes and exit the BIOS, or select No to keep the BIOS screen open for further changes.

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>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, click **Yes** to quit BIOS without saving the changes, or click No to quit the BIOS and save changes.

Save Changes and Reset

When you have completed the system configuration changes, select this option to save the changes 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>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, click **Yes** to quit BIOS without saving the changes, or click No to quit the BIOS and save changes.

Discard Changes and Reset

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 Reset from the Exit menu and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, click **Yes** to quit BIOS without saving the changes, or click No to quit the BIOS and save changes.

Save Options

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 feature and press <Enter> to discard all the changes and return to the BIOS setup. When the dialog box appears, asking you if you want to load previous values, click **Yes** to load the values previous saved, or click No to keep the changes you've made so far.

Restore Defaults

Select this feature and press <Enter> to load the default settings. These are factory settings designed for maximum system stability, but not for maximum performance. When the dialog box appears, asking you if you want to load the default settings, click **Yes** to load the default settings, or click No to abandon defaults.

Save As User Defaults

Select this feature and press <Enter> to save the current settings as the user's defaults. When the dialog box appears, asking you if you want to save values as

user's defaults, click **Yes** to save the current values as user's default settings, or click No to keep the defaults previously saved as the user's defaults.

Restore User Defaults

Select this feature and press <Enter> to load the user's defaults previously saved in the system. When the dialog box appears, asking you if you want to restore user's defaults, click Yes to restore the user's defaults previously saved in the system, or click No to abandon the user's defaults that were previously saved.

Boot Override

This feature allows the user to enter a new setting to overwrite the original setting that was saved for the following devices:

- UEFI: Network Card
- IBA GE Slot 0700 v1371
- UEFI: Built-in EFI Shell

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue with bootup. The error messages normally appear on the screen.

Fatal errors will not allow the system to continue to bootup. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

A-1 BIOS Error Beep Codes

BIOS Error Beep Codes		
Beep Code/LED	**Error Message**	**Description**
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
5 beeps	Display memory read/write error	Video adapter missing or with faulty memory
OH LED On	System OH	System Overheat

Notes

Appendix B

System Specifications

Processors
Single Intel Xeon E5-2600/E5-1600 series processor in an LGA2011 socket

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

Chipset
Intel C600-A/D chipset

BIOS
8 Mb Award® SPI Flash ROM

Memory Capacity
Eight DIMM sockets support up to 256 GB of DDR3-1600/1333/1066 ECC R/LRDIMMs or up to 64GB of ECC UDIMMs

See the memory section in Chapter 5 for details.

SATA
Intel on-chip controllers support ten SATA ports (two SATA 3.0 ports and eight SATA 2.0 ports) (RAID 0, 1 5 and 10 supported)

Drive Bays
Four hot-swap drive bays to house four SATA drives

Serverboard
X9SRW-F (WIO form factor)
Dimensions: 8.15" x 13.05" in (207 x 331 mm)

Chassis
SC815TQ-R500WB Form Factor: 1U rackmount
Dimensions: (WxHxD) 17 x 1.7 x 25.6 in. (432 x 43 x 650 mm)

Weight
Gross (Bare Bone): 43 lbs. (19.5 kg.)

System Cooling
Four 4-cm heavy-duty counter-rotating fans

System Input Requirements
AC Input Voltage: 100-240V AC auto-range
Rated Input Current: 6.1A - 2.6A
Rated Input Frequency: 50 to 60 Hz

Power Supply
Rated Output Power: 500W (Part# PWS-501P-1R)
Rated Output Voltages: +12V (41.7A), +5Vsb (4A)

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

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

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

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

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

Notes

(continued from front)

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