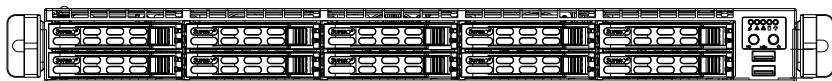


SUPERO[®]

SUPERSERVER

1027R-73DBRF



USER'S MANUAL

1.0

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Release Date: September 25, 2012

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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 1027R-73DBRF. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 1027R-73DBRF is a high-end server based on the SC116TQ-R700CB 1U rackmountable chassis and the X9DRD-7LN4F dual processor serverboard.

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 X9DRD-7LN4F serverboard and the SC116TQ-R700CB chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 1027R-73DBRF 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 1027R-73DBRF.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X9DRD-7LN4F serverboard, 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 serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC116TQ-R700CB server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

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

Appendix A: BIOS Error Beep Codes

Appendix B: System Specifications

Notes

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Appendix A BIOS Error Beep Codes

Appendix B System Specifications

Chapter 1

Introduction

1-1 Overview

The SuperServer 1027R-73DBRF is a high-end server comprised of two main sub-systems: the SC116TQ-R700CB 1U chassis and the X9DRD-7LN4F dual processor serverboard. 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 serverboard and chassis, various hardware components have been included with the 1027R-73DBRF, as listed below:

- Two passive CPU heatsinks (SNK-P0047PS)
- Six 4-cm PWM fans (FAN-0101L4)
- One air shroud (MCP-310-19010-0N)
- SAS/SATA Accessories
 - One SAS/SATA backplane (BPN-SAS-116TQ)
 - Ten drive carriers (MCP-220-00047-0B)
- One riser card (RSC-RR1U-E8)
- One CD containing drivers and utilities
- One rackmount kit (MCP-290-00043-0N)
- SuperServer 1027R-73DBRF User's Manual

Note: a complete list of safety warnings is provided on the Supermicro web site at http://super-dev/about/policies/safety_information.cfm

1-2 Serverboard Features

The SuperServer 1027R-73DBRF is built around the X9DRD-7LN4F, a dual processor serverboard based on the Intel C602J chipset and designed to provide maximum performance. Below are the main features of the X9DRD-7LN4F. (See Figure 1-1 for a block diagram of the chipset.)

Processors

The X9DRD-7LN4F supports single or dual Intel® Xeon E5-2600 Series processors in LGA 2011 sockets (Socket R). Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X9DRD-7LN4F has 16 DIMM slots that can support up to 512 GB of RDIMM, ECC LRDIMM or ECC/non-ECC UDIMM DDR3-1600/1333/1066/800 type memory. See Chapter 5 for details.

SAS

A total of eight SAS 2.0 ports are provided with an LSI 2308 SAS controller. RAID levels 0, 1, and 10 are supported.

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

Serial ATA

A SATA controller is also integrated into the chipset to provide two SATA 3.0 (6/ Gbps) and four SATA 2.0 (3 Gbps) ports, which are RAID 0, 1, 5 and 10 supported. The SATA drives are hot-swappable units.

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

PCI Expansion Slots

The X9DRD-7LN4F has six PCI-E 3.0 x8 slots, only one of which may be used in the 1027R-73DBRF. PCI slots are controlled by CPUs: both CPUs must be installed to utilize all slots. See Chapter 5 for details.

Rear I/O Ports

Ports on the I/O backplane include one COM port, a VGA port, four USB 2.0 ports, four gigabit Ethernet ports and one IPMI port. A UID (Unit Identifier) button and LED are also located beside the VGA port.

1-3 Server Chassis Features

The SC116TQ-R700CB is Supermicro's third-generation 1U chassis and features ten 2.5" hard drive bays and two high-efficiency power supplies. The following is a general outline of the main features of the SC116TQ-R700CB chassis.

System Power

The SC116TQ-R700CB features a 700W-750W power supply composed of two separate power modules to provide power redundancy. This power redundancy feature allows you to replace a failed power supply module without shutting down the system.

Hard Drive Subsystem

The SC116TQ-R700CB chassis was designed to support ten hot-swap SATA or SAS hard drives.

Front Control Panel

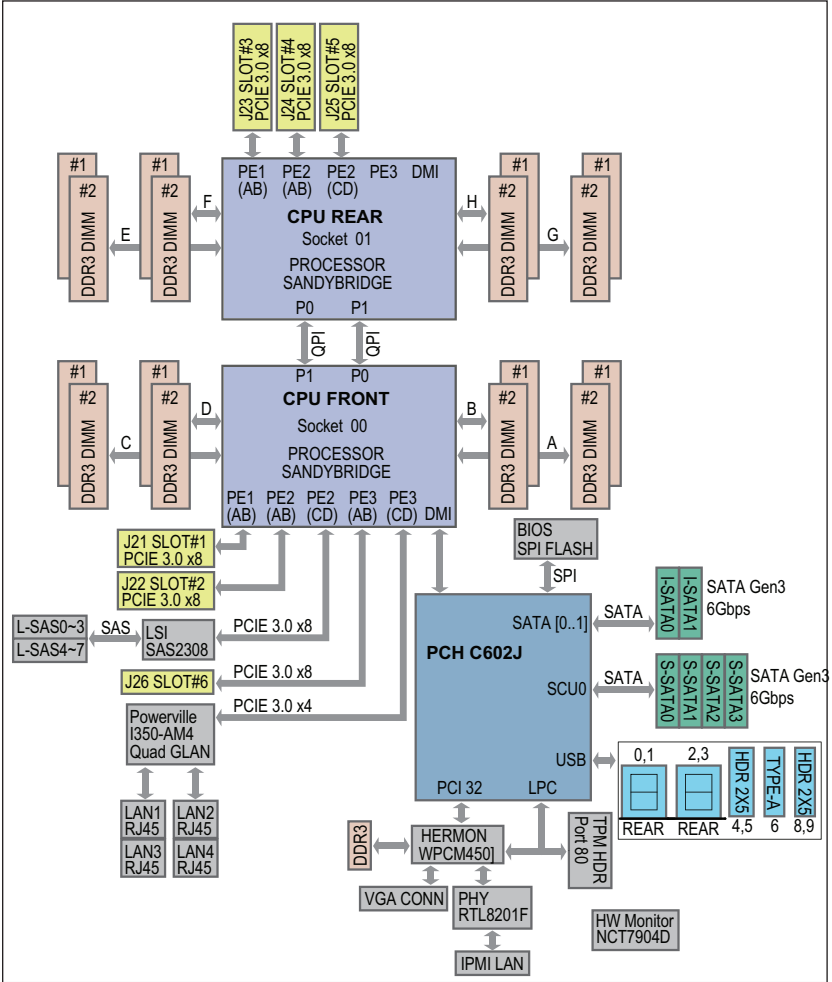
The control panel on the SC116TQ-R700CB provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity and a UID (Universal Information) LED. Also present are a main power button and a UID button.

Cooling System

The SC116TQ-R700CB chassis has an innovative cooling design that features six sets of 4-cm counter-rotating fans located in the middle section of the chassis. These fans are 1U high and are powered by 4-pin connectors, with chassis fan speed controlled by IPMI software. The power supply module also includes a cooling fan.

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

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



1-4 Contacting Supermicro

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Notes

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 1027R-73DBRF up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperServer 1027R-73DBRF 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 SuperServer 1027R-73DBRF. 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. Read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the SuperServer 1027R-73DBRF 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 according to §2 of the the German Ordinance for Work with Visual Display Units.



Warnings and Precautions!



Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from 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 any hot plug 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 (T_{mra}).

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 Rack Mounting Instructions

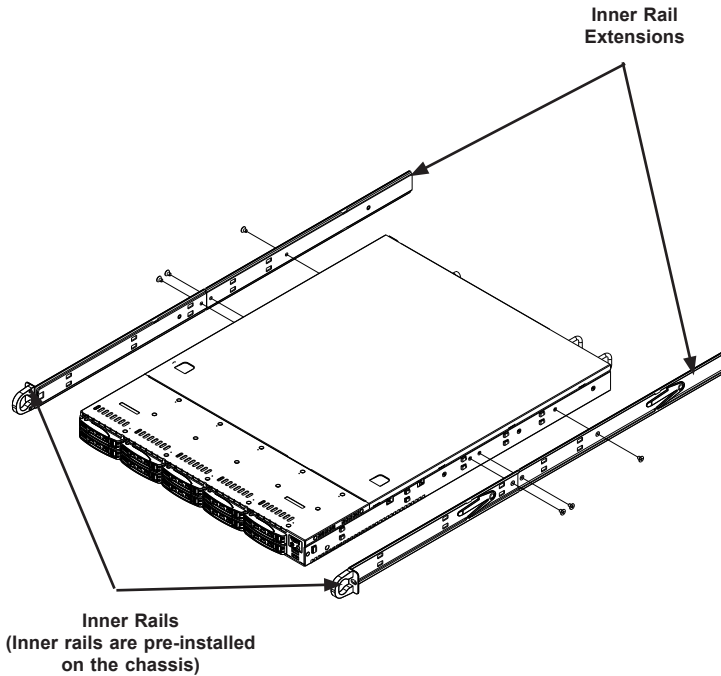
This section provides information on installing the SC116 chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

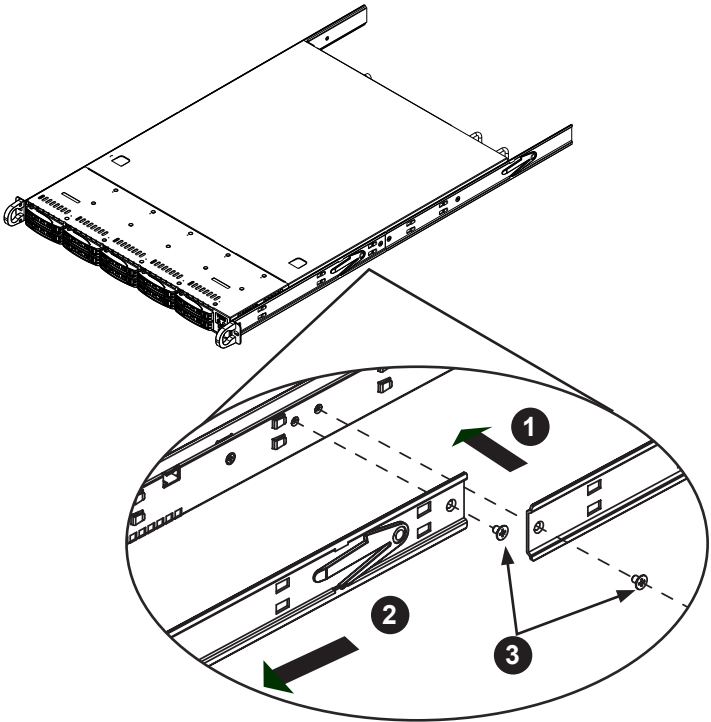
NOTE: This rail will fit a rack between 26" and 33.5" deep.

Identifying the Sections of the Rack Rails

The chassis package includes 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.

Figure 2-1. Identifying the Sections of the Rack Rails





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

Inner Rail Extension

The SC116 chassis includes a set of inner rails in two sections: inner rails and inner rail extensions. The inner rails are pre-attached and do not interfere with normal use of the chassis if you decide not to use a server rack. Attach the inner rail extension to stabilize the chassis within the rack.

Installing the Inner Rails

1. Place the inner rail extensions on the side of the chassis aligning the hooks of the chassis with the rail extension holes. Make sure the extension faces "outward" just like the pre-attached inner rail.
2. Slide the extension toward the front of the chassis.
3. Secure the chassis with two screws as illustrated.
4. Repeat steps 1-3 for the other inner rail extension.

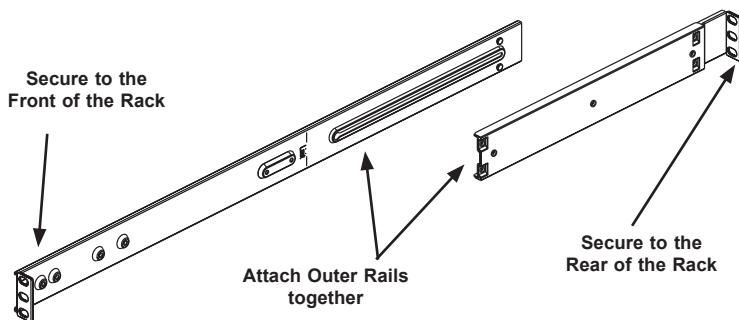


Figure 2-3. Assembling the Outer Rails

Outer Rails

Installing the Outer Rails to the Rack

1. Attach the shorter outer rail to the outside of the longer outer rail. You must align the pins with the slides. Both bracket ends must face the same direction.
2. Adjust both the shorter and longer rails to the proper distance so that the rail fits snugly into the rack.
3. Secure the long bracket to the front side of the outer rail with two M5 screws and the short bracket to the rear side of the outer rail with three M5 screws.
4. Repeat steps 1-4 for the left outer rail.

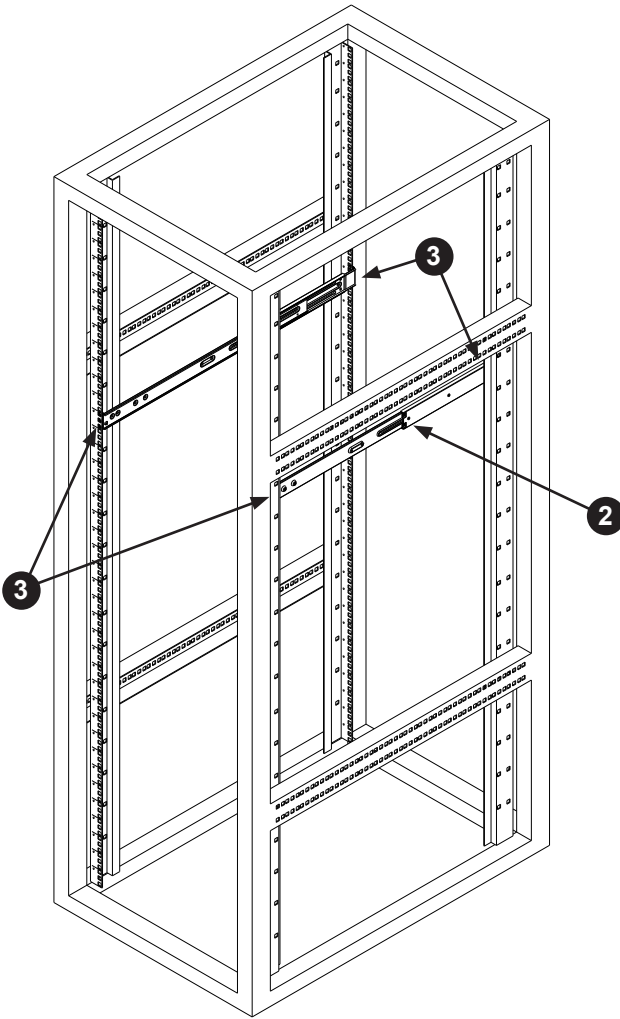


Figure 2-4. Installing the Outer Rails to the Server Rack

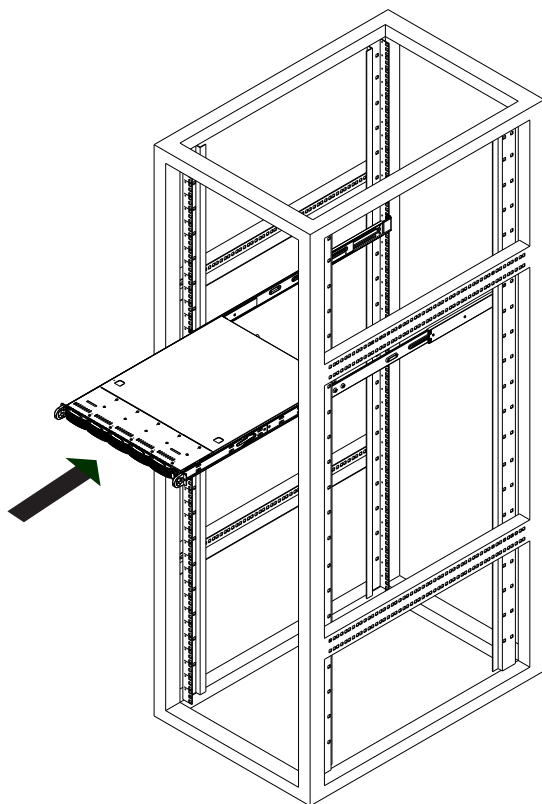


Figure 2-5. Installing the Rack Rails

Installing the Chassis into a Rack

1. Confirm that chassis includes the inner rails and inner rail extensions. Also confirm that the outer rails are installed on the rack.
2. Align the chassis inner rails with the front of the out rails on the rack.
3. 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). When the server has been pushed completely into the rack, you should hear the locking tabs click into position.
4. (Optional) Insert and tighten the thumbscrews that hold the front of the server to the rack.

Installing the Chassis into a Telco rack

To install the chassis into a Telco or post-style 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.

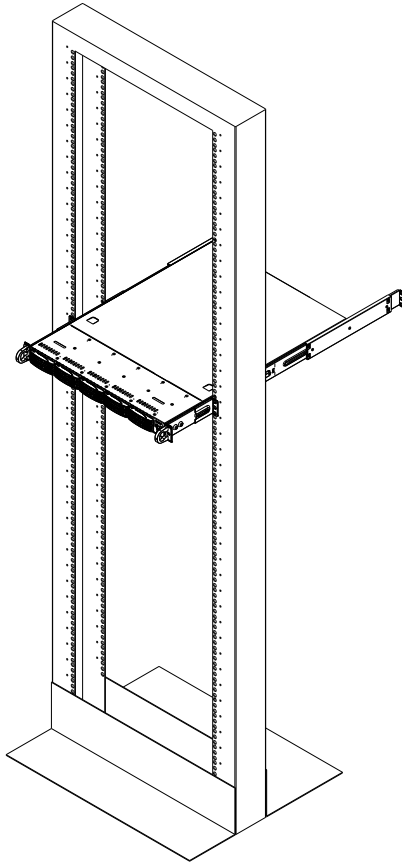


Figure 2-6. Installing the Chassis into a Telco Rack

Notes

Chapter 3

System Interface

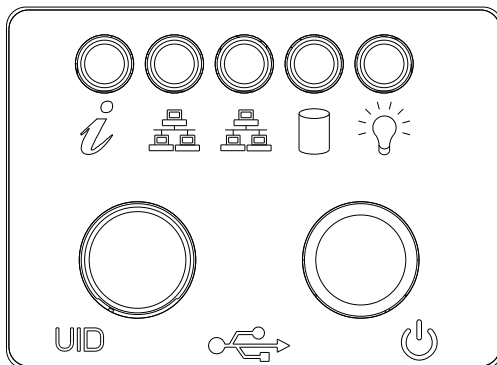
3-1 Overview

There are several LEDs on the control panel and on the drive carriers that provide system and component status for the 1027R-73DBRF server. This chapter explains the meanings of all LED indicators and the appropriate responses that need to be taken.

3-2 Control Panel Buttons

There are two buttons located on the front of the chassis: a power on/off button and a UID button.

Figure 3-1. Control Panel Buttons and LEDs





Power

The main power switch 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. Therefore, you must unplug system before servicing.



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. See the table in Figure 3-1 for descriptions of UID LED states.

3-3 Control Panel LEDs

The control panel located on the front of the SC116 chassis has five LEDs. These LEDs provide critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any action that may be required. See Figure 3-1 for the locations of the LEDs.

Universal Information LED

When this LED blinks red quickly, it indicates a fan failure and when blinking red slowly a power failure. This 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.

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.)

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



NIC1

Indicates network activity on GLAN1 when flashing.



NIC2

Indicates network activity on GLAN2 when flashing.



HDD

Indicates IDE channel activity. SAS2/SATA drive 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

The SC116 chassis uses SAS2/SATA drives.

SAS/SATA Drives

Each SAS/SATA drive carrier has two LEDs.

- Green: Each hard drive carrier has a green LED. When illuminated, this green LED (on the front of the hard 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 a SAS/SATA drive failure. If one of the SAS/SATA drives fail, you should be notified by your system management software.

Chapter 4

System Safety

4-1 Electrical Safety Precautions



Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 1027R-73DBRF from damage. **Note:** a complete list of safety warnings is provided on the Supermicro web site at http://super-dev/about/policies/safety_information.cfm.

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard and memory modules. 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.

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (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 1027R-73DBRF clean and free of clutter.
- The 1027R-73DBRF weighs approximately 44 lbs (20 kg.) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

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

4-3 ESD Precautions



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

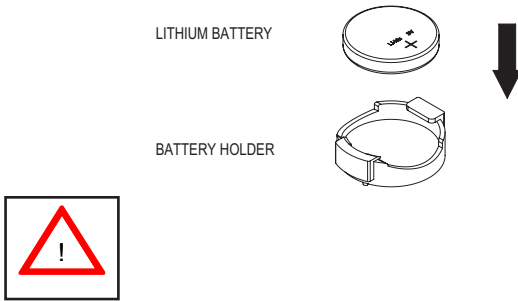
- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions



Care must be taken to assure that the chassis cover is in place when the 1027R-73DBRF 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 Serverboard Setup

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

5-1 Handling the Serverboard

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

Precautions

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

Unpacking

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

5-2 Connecting Cables

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

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-10 for connector locations.)

- SATA and SAS drive data cables (SAS0 ~ SAS7) (SATA0 ~ SATA1)
- Control Panel cable (JF1)
- USB cable for front side access (USB4/5)

Important! Make sure the cables do not come into contact with the fans.

Connecting Power Cables

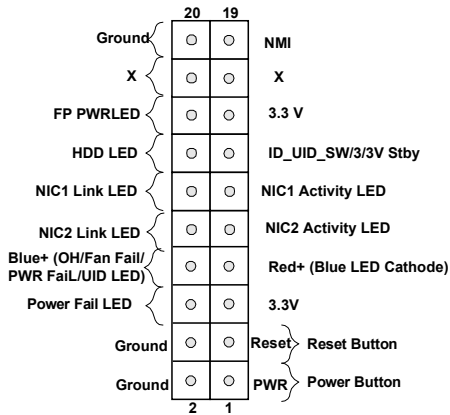
The X9DRD-7LN4F has a 24-pin primary power supply connector (JPW1) for connection to the ATX power supply. In addition, there are two 8-pin 12V processor power connectors (JPW2 and JPW3) that must be connected to your power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

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

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

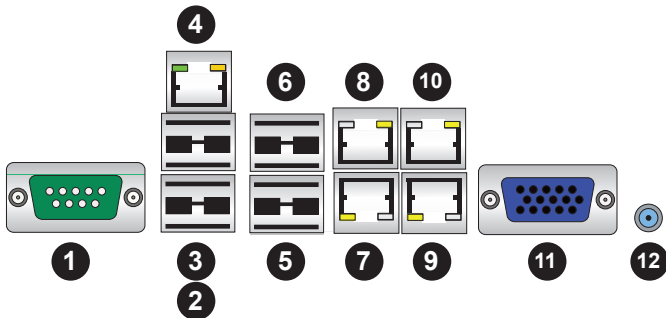
Figure 5-1. Control Panel Header Pins



5-3 Rear 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 I/O Ports



Rear I/O Ports	
1	COM Port 1
2	USB Port 0
3	USB Port 1
4	Dedicated IPMI LAN
5	USB Port 2
6	USB Port 3
7	Gb LAN Port 1
8	Gb LAN Port 3
9	Gb LAN Port 2
10	Gb LAN Port 4
11	VGA Port
12	UID Button

5-4 Installing the Processor and Heatsink

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

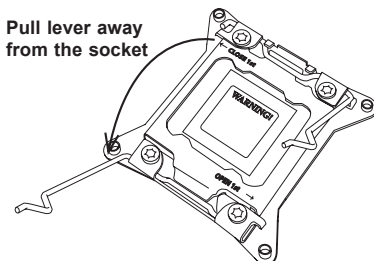
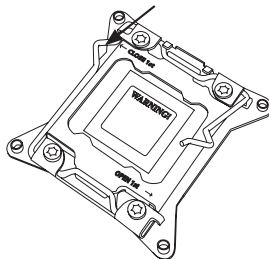
Notes:

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

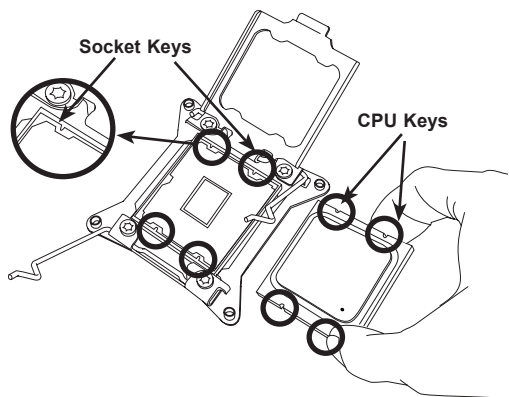
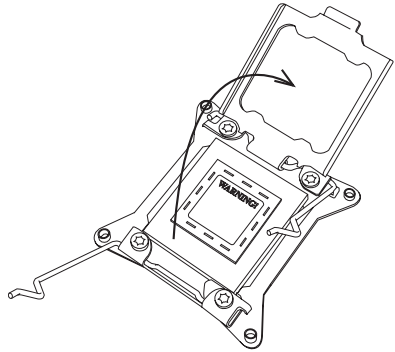
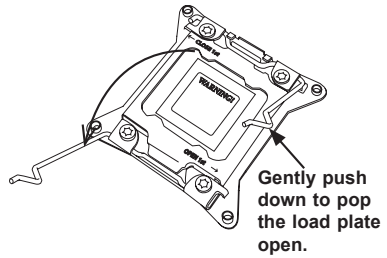
Installing an LGA 2011 Processor

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.

Press down on the lever labeled
'Close 1st'

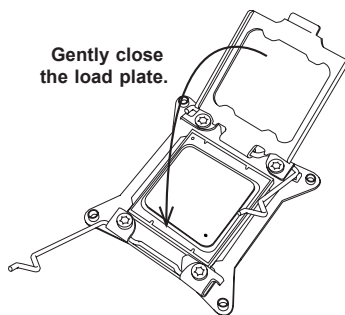


3. With the lever labeled 'Close 1st' fully retracted, gently push down on the 'Open 1st' lever to open the load plate. Lift the load plate to open it completely.
4. Using your thumb and the index finger, remove the 'WARNING' plastic cap from the socket.
5. Use your thumb and index finger to hold the CPU by its edges. Align the CPU keys, which are semi-circle cutouts, against the socket keys.
6. Once they are aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically and do not rub the CPU against any pins of the socket, which may damage the CPU or the socket.)

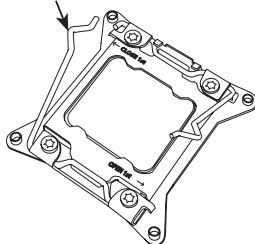


Caution: You can only install the CPU to the socket in one direction. Make sure that the CPU is properly inserted into the socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is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

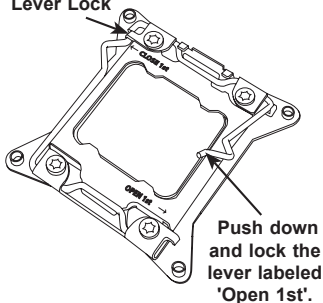
7. With the CPU in the socket, inspect the four corners of the CPU to make sure that they are flush with the socket.
8. Close the load plate. Lock the lever labeled 'Close 1st', then lock the lever labeled 'Open 1st'. Use your thumb to gently push the load levers down until the lever locks.
9. Repeat steps to install to the remaining CPU socket.



Push down and lock the level labeled 'Close 1st'.



Lever Lock



Installing and Removing a Passive CPU Heatsink

1. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the serverboard and the heatsink bracket underneath.
3. Screw in two diagonal screws (i.e., the #1 and the #2 screws) until just snug (to avoid possible damage to the CPU, do not over-tighten the screws.)
4. Add the two remaining screws then fully tighten all four screws.

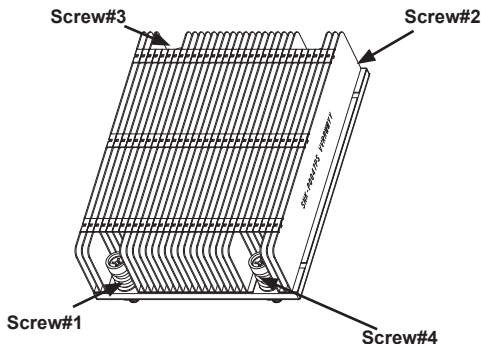
Removing the Heatsink

Caution: Removing the CPU or the heatsink is not recommended. However, if necessary, please follow the instructions below.

1. Unscrew the heatsink screws from the serverboard in the sequence shown.
2. Gently wriggle the heatsink to loosen it from the CPU (do not use excessive force). Once the CPU is loose, remove the it from the CPU socket.
3. Clean the surface of the CPU and the heatsink to remove the used thermal grease. Reapply the proper amount of thermal grease then re-install the CPU and the heatsink.

Figure 5-1. Installing the Heatsink

Loosen screws
in sequence as
shown.



5-5 Installing Memory

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

Memory Support

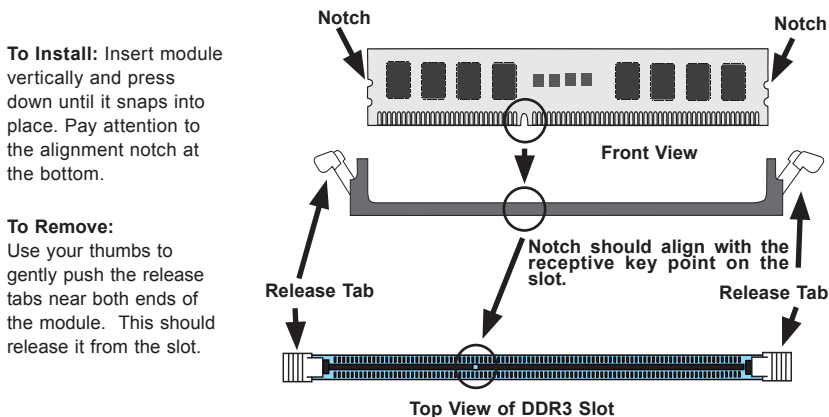
The X9DRD-7LN4F supports up to 512 GB of ECC registered (RDIMM), ECC Load Reduced (LRDIMM) or ECC/non-ECC unbuffered (UDIMM) DDR3-1600/1333/1066/800 SDRAM in 16 DIMM sockets. All channels will run at the fastest common frequency.

DIMM Installation

Installing Memory Modules

1. Insert the desired number of DIMMs into the memory slots starting with P1-DIMMA1. See the Memory Installation Tables below.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to avoid installing incorrectly (see Figure 5-3).
3. Use your thumbs to gently press down on both ends of the DIMM module until it snaps into place in the slot. Repeat for all modules.
4. Press the release tabs to the locked positions to secure the DIMM module into the slot.

Figure 5-3. DIMM Installation



DIMM Module Population Table

Follow the tables below when installing memory.

Processors and their Corresponding Memory Modules								
CPU#	Corresponding DIMM Modules							
CPU 1	P1-DIMMA1	P1-DIMMB1	P1-DIMMC1	P1-DIMMD1	P1-DIMMA2	P1-DIMMB2	P1-DIMMC2	P1-DIMMD2
CPU2	P2-DIMME1	P2-DIMMF1	P2-DIMMG1	P2-DIMMH1	P2-DIMME2	P2-DIMM F2	P2-DIMMG2	P2-DIMMH2

Processor and Memory Module Population for Optimal Performance	
Number of CPUs+DIMMs	CPU and Memory Population Configuration Table (For memory to work properly, please follow the instructions below.)
1 CPU & 2 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1
1 CPU & 4 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1
1 CPU & 5-8 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1 + Any memory pairs in P1-DIMMA2/P1-DIMMB2/P1-DIMMC2/P1-DIMMD2 slots
2 CPUs & 4 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1
2 CPUs & 6 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1
2 CPUs & 8 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1
2 CPUs & 10-16 DIMMs	CPU1/CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1 + Any memory pairs in P1, P2 DIMM slots
2 CPUs & 16 DIMMs	CPU1/CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1, P1-DIMMA2/P1-DIMMB2/P1-DIMMC2/P1-DIMMD2, P2-DIMME2/P2-DIMMF2/P2-DIMMG2/P2-DIMMH2

Populating UDIMM (ECC/Non-ECC) Memory Modules

Intel E5-2600 Series Processor UDIMM Memory Support									
Ranks Per DIMM & Data Width	Memory Capacity Per DIMM (See the Note below)			Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)					
				1 Slot Per Channel		2 Slots Per Channel			
	1DPC		1DPC		2DPC				
	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V			
SRx8 Non-ECC	1GB	2GB	4GB	NA	1066, 1333, 1600	NA	1066, 1333	NA	1066, 1333
DRx8 Non-ECC	2GB	4GB	8GB	NA	1066, 1333, 1600	NA	1066, 1333	NA	1066, 1333
SRx16 Non-ECC	512MB	1GB	2GB	NA	1066, 1333, 1600	NA	1066, 1333	NA	1066, 1333
SRx8 ECC	1GB	2GB	4GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333	1066	1066, 1333
DRx8 ECC	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333	1066	1066, 1333

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Populating RDIMM (ECC) Memory Modules

Intel E5-2600 Series Processor RDIMM Memory Support									
Ranks Per DIMM & Data Width	Memory Capacity Per DIMM (See the Note Below)			Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)					
				1 Slot Per Channel		2 Slots Per Channel			
	1DPC		1DPC		2DPC				
	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V			
SRx8	1GB	2GB	4GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600
DRx8	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600
SRx4	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600
DRx4	4GB	8GB	16GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600
QRx4	8GB	16GB	32GB	800	1066	800	1066	800	800
QRx8	4GB	8GB	16GB	800	1066	800	1066	800	800

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Populating LRDIMM (ECC) Memory Modules

Intel E5-2600 Series Processor LRDIMM Memory Support						
Ranks Per DIMM & Data Width (See the Note Below)	Memory Capacity Per DIMM		Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)			
			1 Slot Per Channel		2 Slots Per Channel	
			1DPC		1DPC and 2DPC	
			1.35V	1.5V	1.35V	1.5V
QRx4 (DDP)	16GB	32GB	1066, 1333	1066, 1333	1066	1066, 1333
QRx8 (P)	8GB	16GB	1066, 1333	1066, 1333	1066	1066, 1333
Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at http://www.supermicro.com/support/resources/mem.cfm .						

Other Important Notes and Restrictions

- For the memory modules to work properly, please install DIMM modules of the same type, same speed and same operating frequency. Mixing of RDIMMs, UDIMMs or LRDIMMs is not allowed. Do not install both ECC and non-ECC memory modules on the same serverboard.
- Using DDR3 DIMMs with different operating frequencies is not allowed. All channels in a system will run at the lowest common frequency.

5-6 Adding PCI Add-On Cards

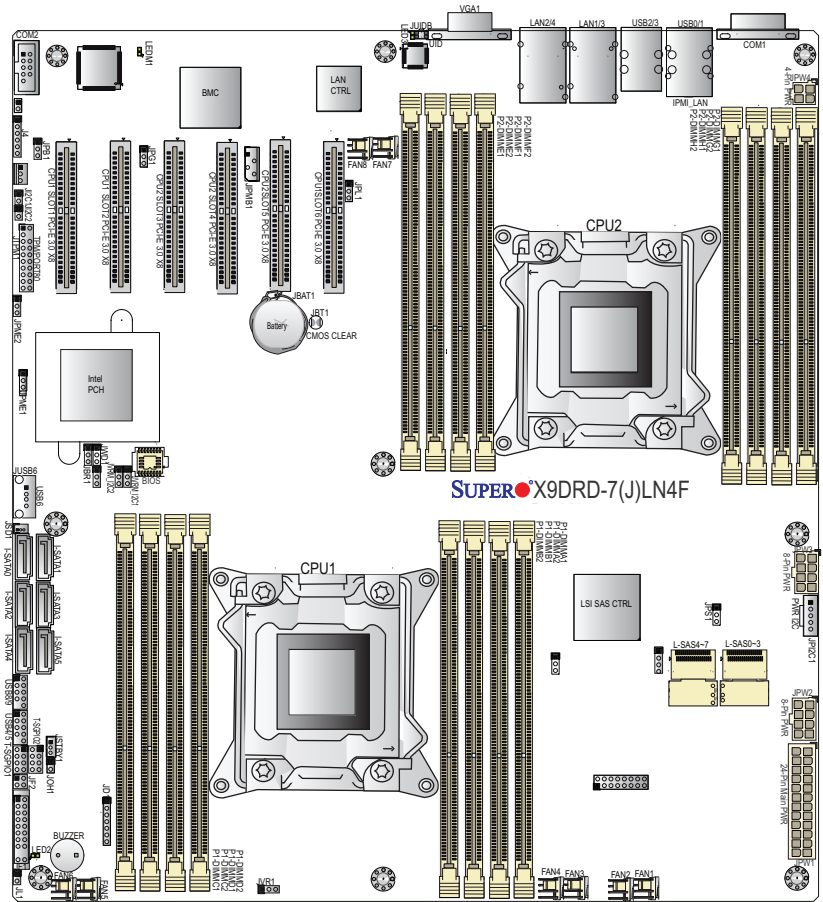
The 1027R-73DBRF can accommodate a single, standard-size PCI-E 3.0 x8 profile add-on (expansion) card installed to the riser card included in the system.

Installing an Add-on Card

1. Begin by removing the shield located by the riser card.
2. Fully seat the card into the riser, pushing down with your thumbs evenly on both sides of the card.
3. Finish by using a screw to secure the top of the card shield to the chassis.
The PCI slot shields protect the serverboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused slot.

5-7 Serverboard Details

Figure 5-4. X9DRD-7LN4F Layout



Notes

- "■" indicates the location of "Pin 1".
- Jumpers not indicated are for test purposes only.

X9DRD-7LN4F Quick Reference

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Section 5-9
J ² C1/J ² C2	SMB to PCI-E Slots	Off (Disabled)
JPB1	BMC Enable/Disable	Pins 1-2 (Enabled)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	GLAN1/GLAN2 Enable/Disable	Pins 1-2 (Enabled)
JPS1	SAS Enable/Disable	Pins 1-2 (Enabled)
JVRM ² C1/2	CPU1/2 VRM I ² C Bus	Pins 2-3 (Manufacturer's Default)
JWD1	Watch Dog Timer	Pins 1-2 (Reset)

Connector	Description
COM1/COM2	Backplane COM Port1/Front Accessible COM2 Header
FAN1~8	CPU/System Fan Headers
JD1	Speaker/Power LED Indicator
JF1	Front Panel Control Header
JF2	LAN3 (NIC3)/LAN4 (NIC4) LED Indicator Connector
JIPMB1	4-pin External BMC I ² C Header (for IPMI Card)
JL1	Chassis Intrusion Header
JOH1	Overheat LED Indicator Header
JPI ² C1	Power Supply SMBbus I ² C Header
JPW1	24-Pin ATX Main Power Connector
JPW2/3	12V 8-Pin Power Connectors
JPW4	12V 4-Pin Power Connectors
JSD1	SATA DOM (Device on Module) Power Connector
JSTBY1	+5V Standby Power Header
JTPM1	TPM (Trusted Platform Module)/Port 80 Header
JUID	UID (Unit Identification) Switch
LAN1/3, LAN2/4	Gigabit Ethernet Ports 1/2, 3/4
(IPMI) LAN	Dedicated IPMI LAN
(I)SATA0~5	SATA 3.0 (0~1) and SATA 2.0 (2~5) Ports (from Intel PCH)
(L)SAS0~3, 4~7	SAS 2.0 Ports 0~3, 4~7 (from LSI SAS 2308 Controller)

Continued on next page.

Slots 1/2/6 (CPU1), Slots 3/4/5 (CPU2)	PCI-Express 3.0 x8 Slots
(T-)SGPIO 1/2	SATA General Purpose I/O Header
(BP) USB 0/1, 2/3	Back Panel USB 0/1, 2/3
(FP) USB 4/5, USB 8/9	Front Panel Accessible USB Connections (4/5, 8/9)
(FP) USB 6	Type A USB Embedded Drive Connector
VGA	Backpanel VGA Port

LED	Description	State	Status
LED2	Standby PWR LED	Green: On	Standby PWR On
LED3	Rear UID LED	Blue: On	Unit Identified
LEDM1	BMC Heartbeat LED	Green: Blinking	BMC Normal

5-8 Connector Definitions

Power Connectors

A 24-pin main power supply connector (JPW1), two 8-pin CPU power connectors (JPW2/3) must be connected to the power supply. These power connectors meet the SSI EPS 12V specification. See the table on the right for pin definitions.

Warning: To provide adequate power supply to the serverboard, be sure to connect all three power connectors to the power supply. Failure to do so will void the manufacturer warranty on your power supply and serverboard.

ATX Power 24-pin Connector Pin Definitions			
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

NC = No Connection

Secondary Power Connector

JPW2 and JPW3 must also be connected to the power supply. See the table on the right for pin definitions.

+12V 4-pin Power Connector Pin Definitions (JPW4)	
Pins	Definition
1-2	Ground
3-4	+12V

+12V 8-pin Power Connector Pin Definitions	
Pins	Definition
1 - 4	Ground
5 - 8	+12V

Power Button

The Power On connection is on pins 1 and 2 of JF1. These should be connected to the chassis power button. See p. 5-4 and the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Power Signal
2	Ground

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See p. 5-4 and the table on the right for pin definitions.

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

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. See p. 5-4 and the table on the right for pin definitions.

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

Overheat (OH)/Fan Fail/PWR Fail/ UID LED

Connect an LED cable to pins 7 and 8 of Front Control Panel to use the Overheat/Fan Fail/Power Fail and UID LED connections. The Red LED on pin 7 provides warnings of over-heat, fan failure or power failure. The Blue LED on pin 8 works as the front panel UID LED indicator. The Red LED takes precedence over the Blue LED by default. Refer to the table on the right for pin definitions.

OH/Fan Fail/ PWR Fail/Blue_UID LED Pin Definitions (JF1)	
Pin#	Definition
7	Red_LED-Cathode/OH/Fan Fail/ Power Fail5.5V.SB
8	Blue_UID LED

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flash- ing	Fan Fail

NIC2 LED

The LED connections for LAN2 are on pins 9 and 10 of JF1. Attach an LED cable to display network activity. See p. 5-4 and the table on the right for pin definitions.

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

NIC1 LED

The LED connections for LAN1 are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See p. 5-4 and the table on the right for pin definitions.

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

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. This LED is used to display all IDE/SAS/SATA activity. See p. 5-4 and the table on the right for pin definitions.

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

Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1 (use JLED for a 3-pin connector). This connection is used to provide LED indication of power being supplied to the system. See p. 5-4 and the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	5V Stby
16	Control

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. See p. 5-4 and the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)	
Pin#	Definition
19	Control
20	Ground

Fan Headers

There are eight fan headers on the serverboard, all of which are 4-pin fans (Fan 1-Fan 8). Pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans. (Fan speed control is supported with 4-pin fans only.) See the table on the right for pin definitions. The onboard fan speeds are controlled by IPMI.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWR Modulation

Chassis Intrusion

The Chassis Intrusion header is designated JL1. Attach a chassis intrusion cable from the chassis to inform you of a chassis intrusion when the chassis is opened

Chassis Intrusion Pin Definitions	
Pin#	Definition
1	Intrusion Input
2	Ground

Serial Ports

Two serial ports are included on the serverboard. COM1 is a backpanel port and COM2 is a header located near PCI-E slot1 to provides front access support. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1/COM2)			
Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Ethernet Ports

Four Ethernet ports are located on the I/O backplane. A dedicated IPMI LAN port is also included to provide KVM support for IPMI 2.0. These ports accept RJ45 type cables.

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

Universal Serial Bus (USB)

Four Universal Serial Bus ports (USB 0/1, USB 2/3) are located on the I/O back panel. In addition, three USB headers, located close to the I/O Hub, provides four front-accessible USB connections (USB 4/5, USB 8/9). One Type A connector (USB6) also supports front panel USB connection (cables are not included). See the tables on the right for pin definitions.

Backplane USB (0/1, 2/3) Pin Definitions		FP USB (4/5, 8/9, USB 6) Pin Definitions			
Pin#	Definition	USB 4, 8, 6, Pin # Definition		USB 5, 9 Pin # Definition	
1	+5V	1	+5V	1	+5V
2	PO-	2	PO-	2	PO-
3	PO+	3	PO+	3	PO+
4	Ground	4	Ground	4	Ground
5	NA	5	NC	5	Key

Unit Identifier Switch

The UID Switch is located next to the VGA port on the backplane. The Rear UID LED (LED3) is located next to the UID switch. The control panel UID LED connection is on pins 7/8 of JF1. Connect a cable to pin 8 on JF1 for Front Panel UID LED indication. When you press the UID switch, both the rear UID LED and control panel UID LED indicators will be turned on. Press the UID switch again to turn off both LED Indicators. These indicators provide easy identification of a system unit that may be in need of service. UID can also be triggered via IPMI.

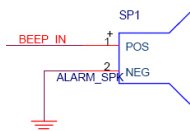
UID Switch	
Pin#	Definition
1	Ground
2	Ground
3	Button In
4	Ground

UID LED (LED3) Status	
Color/State	Status
Blue: On	Unit Identified

Internal Speaker

The internal speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions..

Internal Buzzer (SP1) Pin Definition		
Pin#	Definitions	
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker



Power LED/Speaker

On the JD1 header, pins 1-3 are for a power LED and pins 4-7 are for the speaker. Close pins 4-7 with a jumper to use an external speaker. If you wish to use the onboard speaker, please close pins 6-7. See the table on the right for speaker pin definitions.

PWR LED Connector Pin Definitions	
Pin Setting	Definition
Pin 1	Anode (+)
Pin2	Cathode (-)
Pin3	NA

Speaker Connector Pin Settings	
Pin Setting	Definition
Pins 4-7	External Speaker
Pins 6-7	Internal Speaker

T-SGPIO Headers

The SGPIO (Serial General Purpose Input/Output) headers are used to communicate with the enclosure management chip on the backplane. See the table on the right for pin definitions.

T-SGPIO Header Pin Definitions			
Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	NC

Overheat/Fan Fail LED

The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating and fan failure. This LED will blink when a fan failure occurs. Refer to the table on the right for pin definitions.

Overheat LED Pin Definitions	
Pin#	Definition
1	VDC
2	OH Active

OH/Fan Fail LED Status	
State	Message
Solid	Overheat
Blinking	Fan Fail

TPM Header/Port 80

A Trusted Platform Module/Port 80 header is located at JTPM1 to provide TPM support and a Port 80 connection. Use this header to enhance system performance and data security. See the table on the right for pin definitions.

TPM/Port 80 Header Pin Definitions			
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	+5V (X)
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK4	14	SMB_DAT4
15	+3V_DUAL	16	SERIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#	20	LDRQ# (X)

Power Supply SMBus I²C Header

The power System Management Bus header at JPI²C1 is used to monitor the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

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

DOM Power Connector

A power connector for SATA DOM (Disk On Module) devices is located at JSD1. Connect an appropriate cable here to provide power support for your DOM devices.

DOM PWR Pin Definitions	
Pin#	Definition
1	+5V
2	Ground
3	Ground

IPMB

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I²C connection on your system.

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

Standby Power Header

The +5V Standby Power header is located at JSTBY1. See the table on the right for pin definitions. (You must also have a card with a Standby Power connector and a cable to use this feature.)

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

LAN3/LAN4 LED Indicators

The NIC (Network Interface Controller) LED connections for LAN Ports 3 and 4 are located on pins 3/4 and 1/2 of JF2, respectively. Attach NIC LED cables here to display network activities. Refer to the table on the right for pin definitions.

LAN Ports 3/4 LED Indicators (JF2) Pin Definitions			
Pin#	Definition	Pin	Definition
1	LAN4 Activity	2	LAN4 Link
3	LAN3 Activity	4	LAN3 Link

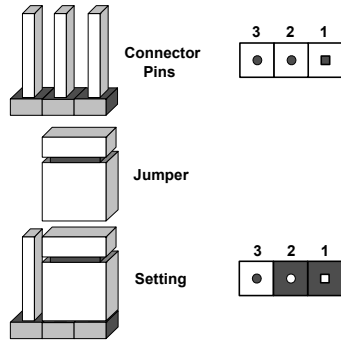
Note: The NIC LED connections for LAN Ports 1/2 are located on JF1.

5-9 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, 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 serverboard layout pages for jumper locations.

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



CMOS Clear

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

To clear CMOS,

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

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

SAS Enable

Jumper JPS1 allows the user to enable onboard LSI SAS support. The default setting is on 1-2 to enable all SAS ports. See the table on the right for jumper settings.

SAS Enable/Disable Jumper Settings	
Jumper Setting	Definition
1-2	Enabled (Default)
2-3	Disabled

LAN Enable/Disable

JPL1 enables or disables the LAN ports 1/2 and 3/4. See the table on the right for jumper settings. The default setting is Enabled.

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

Watch Dog Enable/Disable

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

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

BMC Enable

Jumper JPB1 allows you to enable the embedded the Winbond WPCM 450 BMC (Baseboard Management Controller) to provide IPMI 2.0/KVM support. See the table on the right for jumper settings.

BMC Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	BMC Enable
Pins 2-3	Disable

SMB Bus to PCI-Exp. Slots

Use Jumpers JI²C1 and JI²C2 to connect the System Management Bus (I²C) to PCI-Express slots in order to improve PCI slot performance. These two jumpers are to be set at the same time. The default setting is Closed to enable the connections. See the table on the right for jumper settings.

I ² C to PCI-E slots Jumper Settings	
Jumper Setting	Definition
Closed	Enabled (Default)
Open	Disabled

VGA Enable/Disable

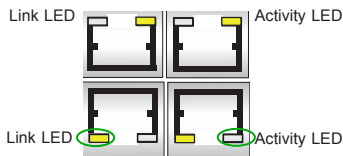
JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

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

5-10 Onboard Indicators

LAN LEDs

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



LAN1/2 LED (Connection Speed Indicator)	
LED Color	Definition
Off	NC or 10 Mbps
Green	100 Mbps
Amber	1 Gbps

IPMI Dedicated LAN LEDs

An additional Dedicated IPMI LAN port is also located on the I/O backplane. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the table at right for more information.



IPMI LAN Link LED (Left) & Activity LED (Right)		
LED	Status	Definition
Link	Green: Solid	100 Mbps
Activity	Amber: Blinking	Active

Onboard Power LED

An Onboard Power LED is located at LED2. This LED Indicator is lit when the system is on. Be sure to unplug the power cord before removing or adding any components. See the table on the right for more details.

Onboard PWR LED Indicator	
LED Color	Definition
Off	System Off (PWR cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State

BMC Heartbeat LED

A BMC Heartbeat LED is located at LEMD1. When blinking, the BMC is functioning normally.

BMC Heartbeat LED	
LED	Definition
D1	Blinking: BMC: Normal

Unit Identification Switch/LED

A Unit Identifier switch (UID) and a rear UID LED indicator (LED3) are located next to LAN ports on the back of the chassis. When the user pushes the rear UID switch, the rear UID LED (LED3) will be turned on. Push the UID switch again to turn off the LED indicator. The UID switch provides easy identification of a system unit that may be in need of service. See the tables on the right for more information.

UID LED Status		
Color/State	OS	Status
Blue: On	Windows OS	Unit Identified
Blue: Blinking	Linux OS	Unit Identified

5-11 SATA and SAS Ports

Serial ATA Ports

There are six Serial ATA Ports (I-SATA0~I-SATA 5) located on the serverboard, including four SATA2 ports and two SATA3 ports. These ports provide serial-link signal connections, which are faster than Parallel ATA. See the table on the right for pin definitions.

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

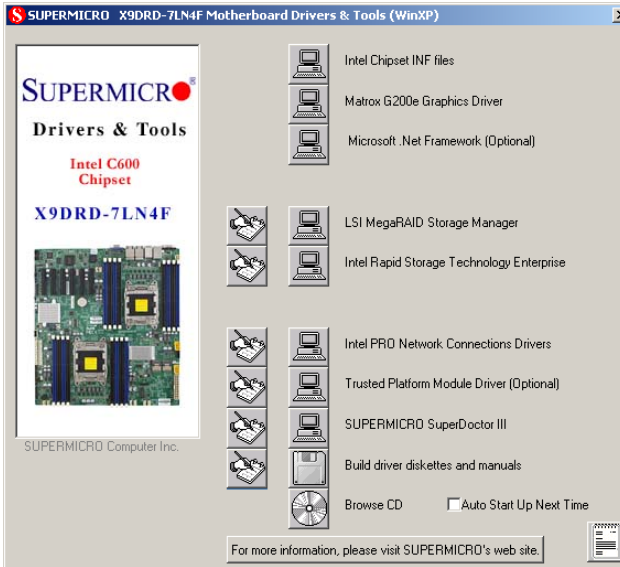
SAS Ports

Eight Serial Attached SCSI ports (SAS 0~3, 4~7) provide serial link connections. These ports are supported by an LSI 2308 ccontroller. See the table on the right for pin definitions.

SAS Port Pin Definitions			
Pin#	Definition	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 serverboard.



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.

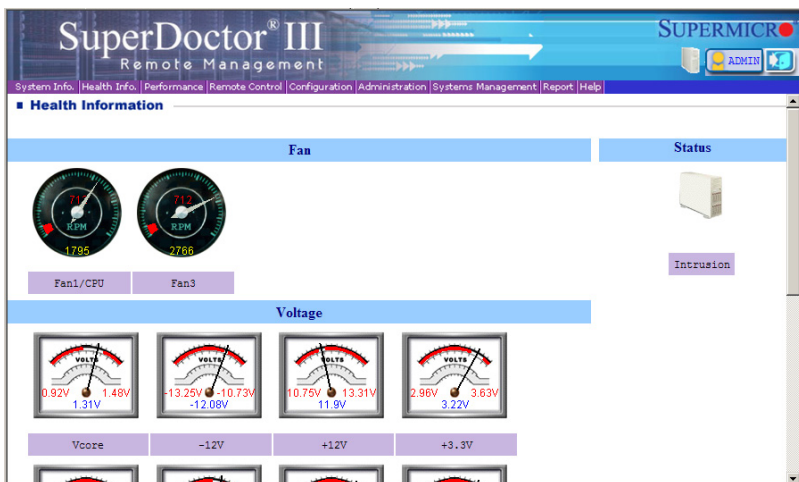
SuperDoctor III

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 serverboard 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.

Supero Doctor III Interface Display Screen (Health Information)



Supero Doctor III Interface Display Screen (Remote Control)



Graceful power control (cancelable)

Supero Doctor III allows a user to inform the OS to reboot or shut down the system within 30 seconds. On the system console, a pop-up window will appear with a message telling the local user to save his working files. Before the system reboots or shuts down, it's allowed to cancel the action either locally or remotely.

Power control (noncancelable)

Supero Doctor III allows a user to inform the OS to reboot or shut down the system right away. The system will reboot or shut down without any warning messages. It's not allowed to cancel the action.

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 SC116TQ-R700CB chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

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

6-1 Static-Sensitive Devices

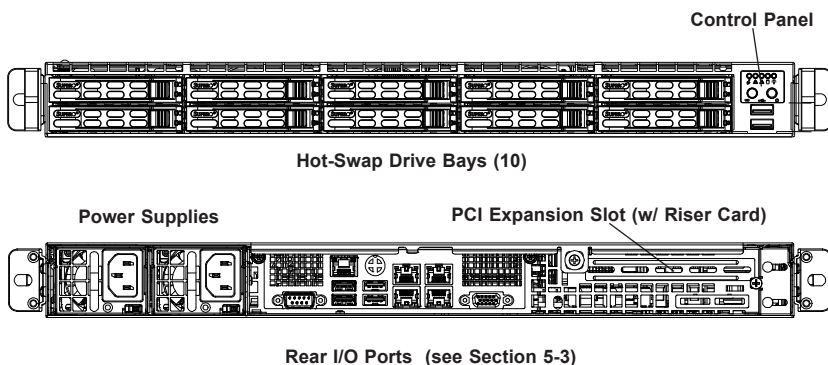
Electrostatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

Precautions

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

Unpacking

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

Figure 6-1. Front and Rear Chassis Views

6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the serverboard to the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path. The LEDs inform you of system status.

See Chapter 3 for details on the LEDs and the control panel buttons. Details on JF1 can be found in Chapter 5.

6-3 System Fans

Six 4-cm fans provide the cooling for the system. 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.

The SC116 chassis contains counter-rotating fans. 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.

System Fan Failure

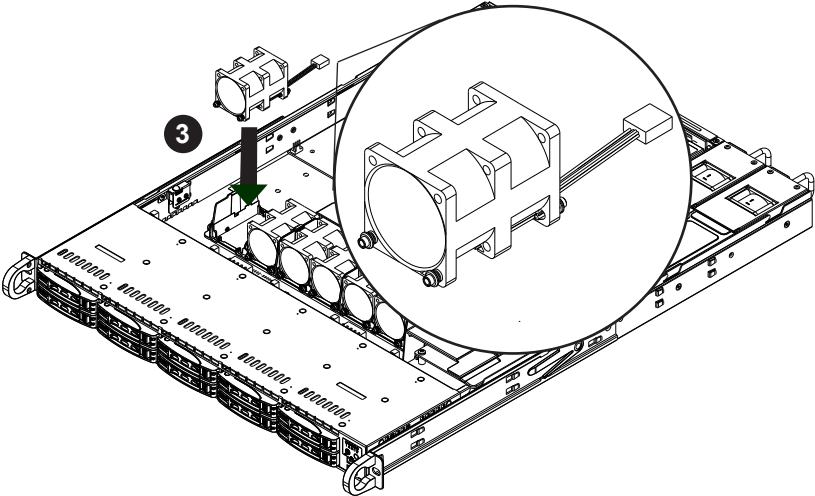
Fan speed is controlled by system temperature via IPMI software. If a fan fails, the remaining fans will ramp up to full speed. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

The SC116 chassis includes four pre-installed fans. One additional open slot is available so that one more fan may be added if additional cooling is required.

Replacing a System Fan (Figure 6-2)

1. Open the chassis while the system is running to determine which fan has failed. Never run the server for an extended period of time with the chassis open.
2. Turn off the power to the system and unplug the power cord from the power supply.
3. Remove the failed fan's wiring from the fan header on the serverboard.
4. Lift the failed fan from the chassis and pull it completely out.
5. Place 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.
6. Reconnect the fan wires to the same chassis fan header as the previous fan.
7. Power up the system and check that the fan is working properly before replacing the chassis cover.

Figure 6-2. Replacing a System Fan



Checking the Airflow

Check the Airflow

1. Make sure there are no objects obstructing the airflow in and out of the server. In addition, if you are using a front bezel, make sure the bezel's filter is replaced periodically.
2. Do not operate the server without hard drives or drive carriers in the drive bays. Use only recommended server parts.
3. Make sure no wires or foreign objects obstruct airflow through the chassis. Pull all excess cabling out of the airflow path or use shorter cables.
4. The control panel LEDs inform you of system status. See Chapter 4 System Interface for details on the LEDs and the control panel buttons.

6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

Hard 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 hard drives. Proceed to the next section for instructions.

Hard Drive Installation

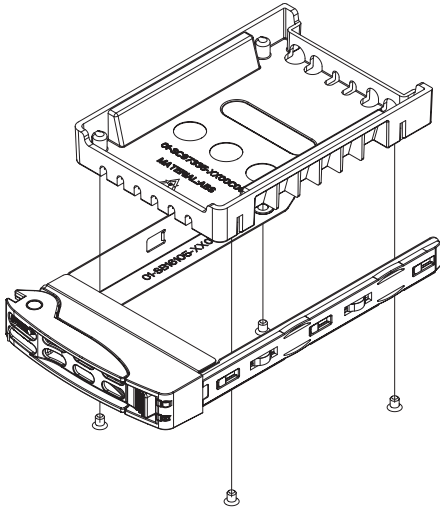
The hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays. For this reason, even empty carriers without drives installed must remain in the chassis.

Installing a Hard Drive into a Drive Carrier (Figure 6-3)

1. Insert a drive into the carrier with the PCB side facing down and the connector end toward the rear of the carrier.
2. Align the drive in the carrier so that the screw holes of both line up. Note that there are holes in the carrier marked "SATA" to aid in correct installation.
3. Secure the drive to the carrier with four screws as illustrated below.

4. Insert the drive carrier into its bay, keeping the carrier oriented so that the hard drive is on the top of the carrier and the release button is on the right side. When the carrier reaches the rear of the bay, the release handle will retract.
5. Push the handle in until it clicks into its locked position

Figure 6-3. Installing a Drive into a Carrier

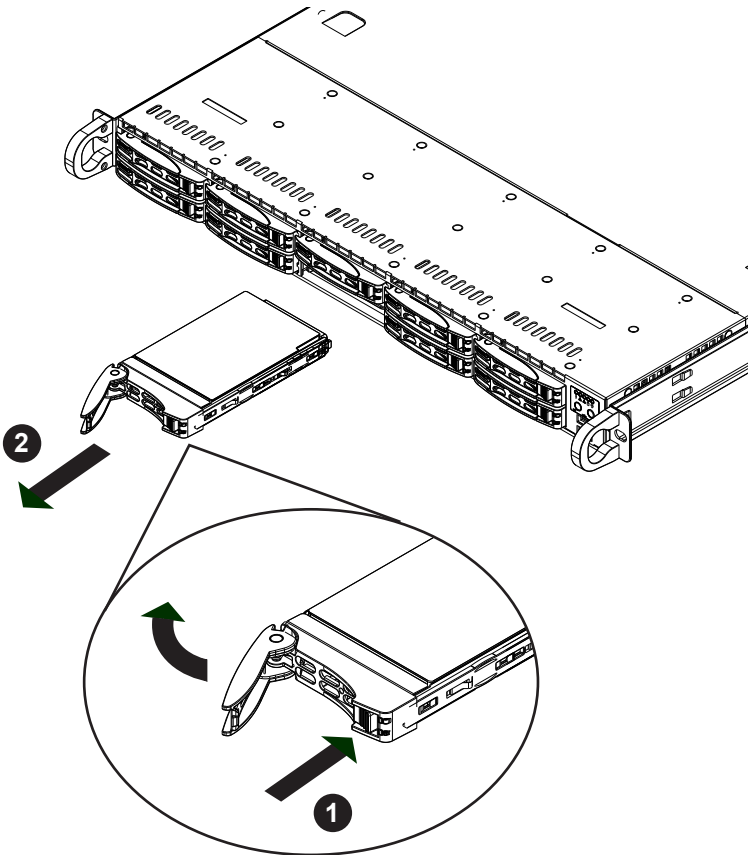


Removing a Hard Drive (Figure 6-4)

1. To remove a carrier, push the release button located beside the drive LEDs.
2. Swing the handle fully out and use it to pull the unit straight out.

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

Figure 6-4. Removing a Hard Drive



Caution: Use caution when working around the hard drive 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.

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

Caution: 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/info/files/storage/SAS-CompList.pdf>

6-5 Power Supply

The SC116 chassis comes equipped with two redundant 700W-750W power supplies. These power supplies are auto-switching capable and automatically sense and operate at a 100v to 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

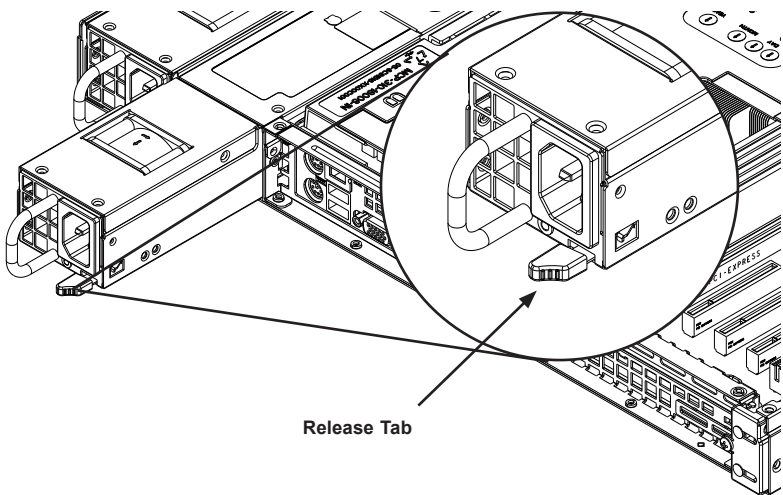
Power Supply Failure

The SC116 chassis includes a redundant power supply, which allows the server to continue running when one power supply has been removed. Replacement units can be ordered directly from Supermicro.

Replacing the Power Supply (Figure 6-5)

1. Check the LEDs on the power supplies to determine which module has failed.
2. Unplug the power cord from the failed module.
3. Push the release tab (on the back of the power supply) as illustrated, then pull the power supply out using the handle provided.
4. Push the new power supply module into the power bay until you hear a click (replace with the same model).
5. Reconnect the power cord to the new module.

Figure 6-5. Removing/Replacing the Power Supply



Chapter 7


BIOS

7-1 Introduction


This chapter describes the AMI BIOS Setup utility for the X9DRD-7JLN4F/X9DRD-7LN4F. It also provides the instructions on how to navigate the AMI BIOS Setup utility screens. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated.

Starting BIOS Setup Utility


To enter the AMI BIOS Setup utility screens, press the key while the system is booting up.

 **Note:** In most cases, the key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F3>, <F4>, 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 informational text. When an option is selected in the left frame, it is highlighted in white. Often informational text will accompany it.

 **Note:** The AMI BIOS has default informational messages built in. The manufacturer retains the option to include, omit, or change any of these informational messages.


The AMI BIOS Setup utility uses a key-based navigation system called "hot keys." Most of the AMI BIOS setup utility "hot keys" can be used at any time during setup navigation. These keys include <F3>, <F4>, <Enter>, <ESC>, arrow keys, etc.

 **Note 1:** Options printed in **Bold** are default settings.

Note 2: <F3> is used to load optimal default settings. <F4> is used to save the settings and exit the setup utility.


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 <Delete> at the appropriate time during system boot.

 **Note:** For AMI UEFI BIOS Recovery, please refer to the UEFI BIOS Recovery User Guide posted @<http://www.supermicro.com/support/manuals/>.

Starting 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 the manufacturer be liable for direct, indirect, special, incidental, or consequential damage arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is being updated 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:

System Date/System Time

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

Supermicro X9DRD-7LN4F**Version**

This item displays the SMC version of the BIOS ROM used in this system.

Build Date

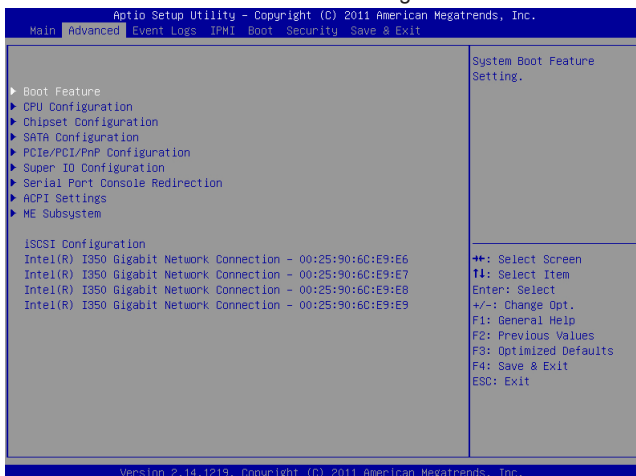
This item displays the date that the BIOS Setup utility was built.

Memory Information**Total Memory**

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

7-3 Advanced Setup Configurations

Select the Advanced tab to access the following submenu items.



► Boot Feature

Quiet Boot

This feature allows the user to select bootup screen display between POST messages and the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

Use this item to set the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM Display setting. Select Force BIOS to use the Option ROM display mode set by the system BIOS. The options are Keep Current and **Force BIOS**.

Bootup Num-Lock

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

Wait For 'F1' If Error

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

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19

at bootup 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.

Power Configuration

Watch Dog Function

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

Power Button Function

If this feature is set to Instant Off, the system will power off immediately as soon as the user presses the power button. If this feature is set to 4 Seconds Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant Off** and 4 Seconds Override.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Stay 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 Stay Off, Power On, and **Last State**.

► CPU Configuration

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

► Socket 1 CPU Information/Socket 2 CPU Information

This submenu displays the following information regarding the CPUs installed in Socket 1/ Socket 2.

- Type of CPU
- CPU Signature
- Microcode Patch
- CPU Stepping
- Maximum / Minimum CPU Speed

- Processor Cores
- Intel HT (Hyper-Threading) Technology
- Intel VT-x Technology
- Intel SMX Technology
- L1 Data Cache / L1 Code Cache
- L2 Cache
- L3 Cache

CPU Speed

This item displays the speed of the CPU installed in Socket 1/Socket 2.

64-bit

This item indicates if the CPU installed in Socket 1 or Socket 2 supports 64-bit technology.

Clock Spread Spectrum

Select Enable to enable Clock Spread 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 Enabled.

RTID (Record Types IDs)

This feature displays the total number of Record Type IDs for local and remote pools. The options are **Optimal** and Alternate.

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 above. (Please refer to Intel's website for more information.) The options are **All**, 1, 2, 4, and 6.

Limit CPUID Maximum

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

Execute-Disable Bit (Available if supported by the OS & the CPU)

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

Intel® AES-NI

Select Enable to use the Intel Advanced Encryption Standard (AES) New Instructions (NI) to ensure data security. The options are **Enabled** and Disabled.

MLC Streamer Prefetcher (Available when supported by the CPU)

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

MLC Spatial Prefetch (Available when supported by the CPU)

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

DCU Streamer Prefetcher (Available when supported by the CPU)

Select Enabled to support Data Cache Unit (DCU) prefetch of L1 data to speed up data accessing and processing in the DCU to enhance CPU performance. The options are Disabled and **Enabled**.

DCU IP Prefetcher

Select Enabled for DCU (Data Cache Unit) IP Prefetcher support, which will prefetch IP addresses to improve network connectivity and system performance. The options are **Enabled** and Disabled.

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

Select Enabled to support Intel Virtualization Technology, which 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.)

► CPU Power Management Configuration

This submenu allows the user to configure the following CPU Power Management settings.

Power Technology

Select Energy Efficiency to support power-saving mode. Select Custom to customize system power settings. Select Disabled to disable power-saving settings. The options are Disabled, **Energy Efficient**, and Custom. If the option is set to Custom, the following items will display:

EIST (Available when Power Technology is set to Custom)

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are Disabled (GV3 Disabled), and **Enabled (GV3 Enabled)**. (**Note:** GV3 is Intel Speedstep support used on older platforms. Please refer to Intel's website for detailed information.)

Turbo Mode (Available when Power Technology is set to Custom)

Select Enabled to use the Turbo Mode to boost system performance. The options are **Enabled** and Disabled.

C1E Support (Available when Power Technology is set to Custom)

Select Enabled to enable Enhanced C1 Power State to boost system performance. The options are **Enabled** and Disabled.

CPU C3 Report (Available when Power Technology is set to Custom)

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

CPU C6 Report (Available when Power Technology is set to Custom)

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

CPU C7 Report (Available when Power Technology is set to Custom)

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

Package C-State limit (Available when Power Technology is set to Custom)

This feature allows the user to set the limit on the C-State package register. The options are C0, C2, **C6**, and No Limit.

Energy/Performance Bias

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

Factory Long Duration Power Limit

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

Long Duration Power Limit

This item displays the power limit (in watts) set by the user during which long duration power is maintained. The default setting is 0.

Factory Long Duration Maintained

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

Long Duration Maintained

This item displays the period of time (in seconds) during which long duration power is maintained. The default setting is 0.

Recommended Short Duration Power

This item displays the short duration power settings (in watts) recommended by the manufacturer.

Short Duration Power Limit

During Turbo Mode, the system may exceed the processors default power setting and exceed the Short Duration Power limit. By increasing this value, the processor can provide better performance for short duration. This item displays the time period during which short duration power is maintained. The default setting is 0.

► Chipset Configuration

► North Bridge

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

► Integrated IO 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 Machine Monitor) 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.

Intel® I/OAT

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

DCA Support

When set to Enabled, this feature uses Intel's DCA (Direct Cache Access) Technology to improve data transfer efficiency. The options are **Enabled** and Disabled.

IIO 1 PCIe Port Bifurcation Control

This submenu configures the following IO PCIe Port Bifurcation Control settings for IIO 1 PCIe ports to determine how the available PCI-Express lanes to be distributed between the PCI-Exp. Root Ports.

CPU1 Slot1 PCI-E 3.0 x8 Link Speed/ CPU1 Slot2 PCI-E 3.0 x8 Link Speed/ CPU1 Slot6 PCI-E 3.0 x8 Link Speed/CPU2 Slot3 PCI-E 3.0 x8 Link Speed/CPU2 Slot4 PCI-E 3.0 x8 Link Speed/CPU2 Slot5 PCI-E 3.0 x8 Link Speed

Select GEN1 for the device installed on the slot specified to support PCI-Exp Generation 1. Select GEN2 for the device installed on the slot specified to support PCI-Exp Generation 2. Select GEN3 for the device installed on the slot specified to support PCI-Exp Generation 3. The options are GEN1, GEN2, and **GEN3**.

IIO 2 PCIe Port Bifurcation Control

This submenu configures the following IO PCIe Port Bifurcation Control settings for IIO 2 PCIe ports to determine how the available PCI-Express lanes to be distributed between the PCI-Exp. Root ports.

►QPI Configuration

Current QPI Link

This item displays the current status of the QPI Link.

Current QPI Frequency

This item displays the frequency of the QPI Link.

Isoc

Select Enabled to enable Isochronous support to meet QoS (Quality of Service) requirements. This feature is especially important for virtualization technology. The options are Enabled and **Disabled**.

QPI (Quick Path Interconnect) Link Speed Mode

Use this feature to select data transfer speed for QPI Link connections. The options are Slow and **Fast**.

QPI Link Frequency Select

Use this feature to select the desired QPI frequency. The options are **Auto**, 6.4 GT/s, 7.2 GT/s, and 8.0 GT/s.

►DIMM Configuration

This section displays the following DIMM information.

Current Memory Mode

This item displays the current memory mode.

Current Memory Speed

This item displays the current memory speed.

Mirroring (Available when supported by the motherboard)

Memory mirroring creates a duplicate copy of the data stored in the memory to enhance data security.

Sparing (Available when supported by the motherboard)

Memory sparing enhances system reliability, availability, and serviceability.

► DIMM Information

CPU Socket 1 DIMM Information, CPU Socket 2 DIMM Information

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

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 Lock Step is selected, the motherboard uses two areas of memory to run the same set of operations in parallel. The options are **Independent**, Mirroring, and Lock Step.

DRAM RAPL Mode

RAPL (Running Average Power Limit) provides mechanisms to enforce power consumption limits on supported processors. The options are Disabled, DRAM RAPL MODE0, and **DRAM RAPL MODE1**.

DDR Speed

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

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 scrambling to 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.

Thermal Throttling

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

► South Bridge Configuration

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.

USB Devices: This item displays the USB devices detected by the BIOS.

All USB Devices

This feature enables all USB ports/devices. The options are Disabled and **Enabled**. (If set to Enabled, EHCI Controller 1 and Controller 2 will appear.)

EHCI Controller 1/EHCI Controller 2 (Available when All USB Devices is set to Enabled)

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

Legacy USB Support (Available when USB Functions is not Disabled)

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

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 does not recognize a USB device. The options are Disabled and **Enabled**.

EHCI Hand-Off

This item is 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.

►SATA Configuration

When this submenu is selected, 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 deactivate the SATA controller, and set the compatibility mode. The options for SATA Controller 0 are Disabled, Enhanced, and **Compatible**. The options for SATA Controller 1 are Disabled and **Enhanced**.

AHCI Mode

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

Aggressive Link Power Management

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

Port 0~5 Hot Plug

Select Enabled to enable hot-plug support for a particular port, which will allow the user to change a hardware component or device without shutting down the system. 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:

SATA RAID Option ROM

Use this feature to determine which SATA RAID device the system will boot from. The options are **Legacy** and EFI.

Port 0~5 Hot Plug

Select Enabled to enable hot-plug support for the particular port. The options are **Enabled** and Disabled.

►PCIe/PCI/PnP Configuration**PCI ROM Priority**

Use this feature to select the Option ROM to boot the system when there are multiple Option ROMs available in the system. The options are **Legacy ROM** and EFI Compatible ROM.

PCI Latency Timer

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

Above 4G Decoding (Available if the system supports 64-bit PCI decoding)

Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are Enabled and **Disabled**.

PERR# Generation

Select Enabled to allow a PCI device to generate a PERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

SERR# Generation

Select Enabled to allow a PCI device to generate an SERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

Maximum Payload

Select Auto to allow the system BIOS to automatically set the maximum payload value for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes and 256 Bytes.

Maximum Read Request

Select Auto to allow the system BIOS to automatically set the maximum Read Request size for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

ASPM Support

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Force L0s to force all PCI-E links to operate at L0s state. Select Auto to allow the system BIOS to automatically set the ASPM level for the system. Select Disabled to disable ASPM support. The options are **Disabled**, Force L0s, and Auto.

 **Warning:** Enabling ASPM support may cause some PCI-E devices to fail!

CPU1 Slot 1 PCI-E 3.0 x8 OPROM, CPU1 Slot 2 PCI-E 3.0 x8 OPROM, CPU2 Slot 3 PCI-E 3.0 x8 OPROM, CPU2 Slot 4 PCI-E 3.0 x8 OPROM, CPU2 Slot 5 PCI-E 3.0 x8 OPROM, CPU1 Slot 6 PCI-E 3.0 x 8 OPROM

Select Enabled to enable Option ROM support to boot the computer using a device installed on the slot specified above. The options are **Enabled** and Disabled.

Onboard LAN Option ROM Select

Select iSCSI to use the iSCSI Option ROM to boot the computer using a network device. Select PXE (Preboot Execution Environment) to use an PXE Option ROM to boot the computer using a network device. The options are **PXE** and iSCSI.

Load Onboard LAN1~LAN4 Option ROM

Select Enabled to enable the onboard LAN1 Option ROM~LAN4 Option ROM. This is to boot the computer using a network device. The default setting for LAN1 Option ROM is **Enabled**, and the default setting for LAN2~LAN4 Option ROM is **Disabled**.

Load Onboard SAS Option ROM

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

VGA Priority

This feature allows the user to select the graphics adapter to be used as the primary boot device. The options are **Onboard**, and **Offboard**.

Network Stack

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

► Super IO Configuration

Super IO Chip: This item displays the Super IO chip used in the motherboard.

► Serial Port 1 Configuration

Serial Port

Select Enabled to enable serial port 1. The options are **Enabled** and **Disabled**.

Device Settings

This item displays the settings of Serial Port 1.

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, IO=3F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E8h, and IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12.

Device Mode

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

► Serial Port 2 Configuration

Serial Port

Select Enabled to enable serial port 2. The options are **Enabled** and **Disabled**.

Device Settings

This item displays the settings of Serial Port 2.

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, IO=3F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; and IO=2E8h, and IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12.

Device Mode

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

Serial Port 2 Attribute

Use this feature to select the attribute for this serial port. The options are **SOL** (Serial Over LAN), and COM.

► Serial Port Console Redirection

COM1, COM2/SOL

These two submenus allow the user to configure the following Console Redirection settings for a COM Port specified by the user.

Console Redirection

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and Disabled. The default setting for COM1 is **Disabled**, and for COM2/SOL is **Enabled**.

► Console Redirection Settings

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

Terminal Type

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

Bits Per second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the

client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600 and **115200** (bits per second).

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

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

Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SC0, ESCN, and VT400.

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

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

Console Redirection (for EMS)

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

► Console Redirection Settings (for EMS)

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

Out-of-Band Management Port

The feature selects a serial port used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote server. The options are **COM1** and COM2/SOL.

Terminal Type

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

Bits Per Second

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

Flow Control

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

Data Bits, Parity, Stop Bits

The status of these features is displayed.

►ACPI Settings

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

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 Disabled 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 Suspend Disabled and **S1 (CPU_Stop_Clock)**.

NUMA (NON-Uniform Memory Access)

This feature enables the Non-Uniform Memory Access ACPI support. The options are **Enabled** and Disabled.

High Precision Event 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.

►Trusted Computing (Available when a TPM device is detected by the BIOS)

Configuration

TPM Support


Select Enabled on this item and enable the TPM jumper on the motherboard to enable 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

Use this item to schedule an operation for the security device. The options are **None**, Enable Take Ownership, Disable Take Ownership, and TPM Clear.

 **Note:** During restart, the computer will reboot in order to execute the pending operation and change the state of the security device.

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.

► Intel TXT (LT-SX) Configuration

Intel TXT (LT-SX) Hardware Support

This feature indicates if the following hardware components support the Intel Trusted Execution Technology.

CPU: TXT (Trusted Execution Technology) Feature

Chipset: TXT (Trusted Execution Technology) Feature

Intel TXT (LT-SX) Configuration

This feature displays the following TXT configuration setting.

TXT (LT-SX) Support: This item indicates if the Intel TXT support is enabled or disabled. The default setting is **Disabled**.

Intel TXT (LT-SX) Dependencies

This feature displays the features that need to be enabled for the Intel Trusted Execution Technology to work properly in the system.

VT-d Support: Intel Virtualization Technology with Direct I/O support

VT Support: Intel Virtualization Technology support

TPM Support: Trusted Platform support

TPM State: Trusted Platform state

► ME Subsystem

This feature displays the following ME Subsystem Configuration settings.

- **ME BIOS Interface Version**
- **ME Version**

iSCSI Configuration: This item displays iSCSI configuration information:

iSCSI Initiator Name

This item displays the name of the iSCSI Initiator, which is a unique name used in the world. The name must use IQN format. The following actions can also be performed:

- Add an Attempt
- Delete Attempts
 - Commit/Discard Changes and Exit
- Change Attempt Order
 - Commit/Discard Changes and Exit

Intel® Ethernet Controller I350 Gigabit Network Connection: These items display the following information on the Intel I350 Gigabit network connections.

► NIC Configuration

Link Speed

Use this feature to change the link speed and duplex for the current port. The options are **AutoNeg**, 10Mbps Half, 10Mbps Full, 100Mbps Half, and 100Mbps full.

Wake on LAN

Select enabled to wake the system with a magic packet. The options are **Enabled** and Disabled.

Blink LEDs

This feature allows the user to specify the duration for LEDs to blink. The range is from 0 ~ 15 seconds. The default setting is **0**.

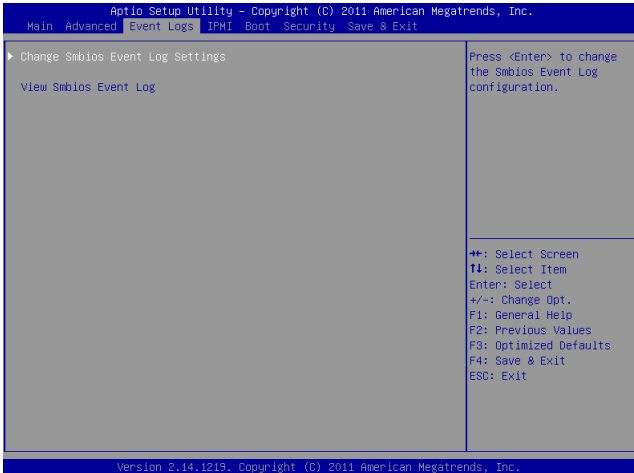
PORT CONFIGURATION INFORMATION

This section displays the following port information:

- UEFI Driver
- Adapter PBA
- Chip Type
- PCI Device ID
- PCI Bus:Device:Function
- Link Status
- Factory MAC Address / Alternate MAC Address

7-4 Event Logs

Select the Event Logs tab to access the following submenu items.



► Change SMBIOS Event Log Settings

This feature allows the user to configure SMBIOS Event settings.

Enabling/Disabling Options

SMBIOS Event Log

Select Enabled to enable SMBIOS (System Management BIOS) Event Logging during system boot. The options are **Enabled** and Disabled.

Runtime Error Logging Support

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

Memory Correctable Error Threshold

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**.

Erasing Settings

Erase Event Log

Select Enabled to erase the SMBIOS (System Management BIOS) Event Log, which is completed before a event logging is initialized upon system reboot. The options are **No**, Yes, Next reset, and Yes, Every reset.

When Log is Full

Select Erase Immediately to immediately erase SMBIOS error event logs that exceed the limit when the SMBIOS event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings

Log System Boot Event

Select Enabled to log system boot events. The options are **Disabled** and Enabled.

MECI (Multiple Event Count Increment)

Enter the increment value for the multiple event counter. Enter a number from 1 to 255. The default setting is **1**.

METW (Multiple Event Count Time Window)

This item allows the user to decide how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number from 0 to 99. The default setting is **60**.

View SMBIOS Event Log

This item allows the user to view the event in the SMBIOS event log. Select this item and press <Enter> to view the status of an event in the log.

Date/Time/Error Code/Severity

7-5 IPMI

Select the IPMI (Intelligent Platform Management Interface) tab to access the following submenu items.



IPMI Firmware Revision

This item indicates the IPMI firmware revision used in your system.

IPMI Status

This item indicates the status of the IPMI firmware installed in your system.

▶ 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.

Custom 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 **Enabled** and Disabled.

 **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: This feature allows the user to configure the settings for LAN1 Port.

Update IPMI LAN Configuration

This feature allows the BIOS to implement any IP/MAC address changes at the next system boot. If the option is set to Yes, any changes made to the settings below will take effect when the system is rebooted. The options are **No** and Yes.

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 DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that is attached to and request the next available IP address for this computer. The options are **DHCP** and Static. The following items are assigned IP addresses automatically if DHCP is selected, or can be configured manually if Static is selected.

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.

Gateway IP Address

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

7-6 Boot

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



Boot Option Priorities

Boot Option #1, Boot Option #2, Boot Option #3, etc.

Use this feature to specify the sequence of boot device priority.

Network Devices, Hard Disk Drives

Use these options to set the order of the legacy network and hard drive devices detected by the motherboard.

► Delete Boot Option

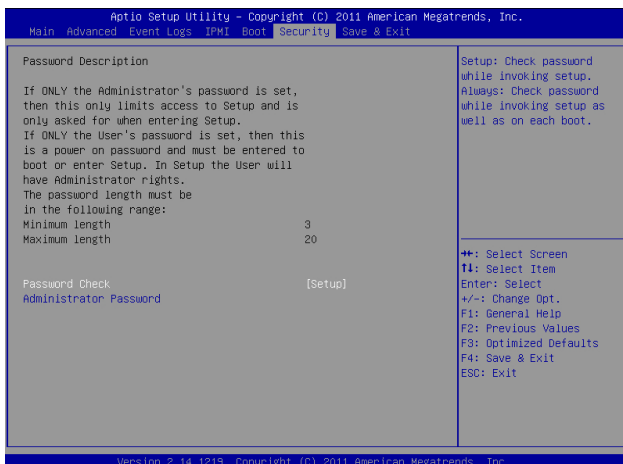
This feature allows the user to select a EFI boot device to delete from the boot priority list.

Delete Boot Option

Select the desired boot device to delete.

7-7 Security

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



Password Check

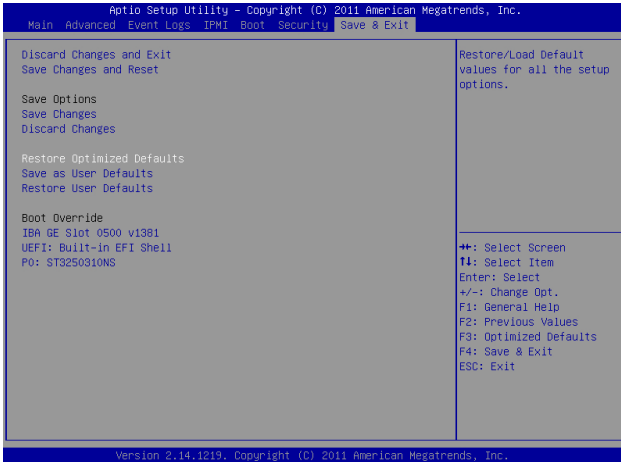
Use this feature to determine when a password entry is required. Select Setup to require the password only when entering setup. Select Always to require the password when entering setup and on each boot. The options are **Setup** and **Always**.

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 to 20 characters long.

7-8 Save & Exit

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



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, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select **Yes** to quit BIOS without saving the changes, or select 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 that the new system configuration settings can take effect. Select Save Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select **Yes** to quit BIOS without saving the changes, or select No to quit the BIOS and save changes.

Save Options

Save Changes

Select this option and press <Enter> to save all changes you've done so far and return to the AMI BIOS utility Program. When the dialog box appears, asking you if you want to save configuration, select **Yes** to save the changes, or select No to return to the BIOS without making changes.

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, select **Yes** to load the values previous saved, or select No to keep the changes you've made so far.

Restore Optimized Defaults

Select this feature and press <Enter> to load the optimized default settings that help optimize system performance. When the dialog box appears, asking you if you want to load optimized defaults, select **Yes** to load the optimized default settings, or select No to abandon optimized 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, select **Yes** to save the current values as user's default settings, or select 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, select **Yes** to restore the user's defaults previously saved in the system, or select No to abandon the user's defaults that were previously saved.

Boot Override

This feature allows the user to override the Boot Option Priorities setting in the Boot menu, and instead boot the system with one of the listed devices. This is a one-time override.

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed at each system boot, errors may occur.

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

Fatal errors will not allow the system to continue with bootup procedure. 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.

BIOS Error Beep Codes		
Beep Code/LED	Error Message	Description
1 beep	Refresh	Ready to boot
5 short beeps + 1 long beep	Memory error	No memory detected in the system
5 beeps	No Con-In or No Con-Out devices	Con-In: USB or PS/2 keyboard, PCI or Serial Console Redirection, IPMI KVM or SOL Con-Out: Video Controller, PCI or Serial Console Redirection, IPMI SOL
X9 IPMI Error Codes		
1 Continuous Beep	System OH	System Overheat

Notes

Appendix B

System Specifications

Processors

Single or dual Intel® Xeon E5-2600 Series processors

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

Chipset

Intel C602J chipset

BIOS

128 Mb AMI® SPI Flash ROM

Memory Capacity

Sixteen DIMM sockets supporting up to 512 GB of RDIMM, ECC LRDIMM or ECC/non-ECC UDIMM DDR3-1600/1333/1066/800 type memory

Note: see Section 5-6 for details.

Drive Bays

Ten hot-swap drive bays to house SAS or SATA drives

Serverboard

X9DRD-7LN4F

Dimensions: 13 x 12 in (330.2 x 340.8 mm)

Chassis

SC116TQ-R700CB (1U rackmount)

Dimensions: (WxHxD) 17.2 x 1.7 x 23.5 in. (437 x 43 x 597 mm)

Weight

44 lbs. (20 kg.)

System Cooling

Six 4-cm counter-rotating fans

System Input Requirements

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

Rated Input Current: 8.5A - 6A max

Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 700W-750W (Part# PWS-704P-1R)

Rated Output Voltages: +3.3V (25A), +5V (25A), +12V (700W, 58A @ 100V-140V, 750W, 62A @ 180V-240V), -12V (0.6A), +5Vsb (3A)

Operating Environment

Operating Temperature: 10° to 35° C (50° to 95° F)

Non-operating Temperature: -40° to 70° C (-40° to 158° F)

Operating Relative Humidity: 8% to 90% (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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