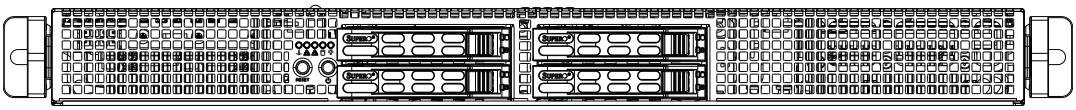
SUPERMICRO®

SUPERSERVER

1026GT-TRF



USER'S MANUAL

Revision 1.0

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

Manual Revision 1.0
Release Date: December 27, 2011

Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 1026GT-TRF. Installation and maintenance should be performed by experienced technicians only.

The 1026GT-TRF is based on the SC118GQ-R1800B 1U rackmount server chassis and the Super X8DTG-QF+ serverboard. Please refer to our web site for an up-to-date list of supported operating systems, processors and memory. See Chapter 1 for a list of differences between the server models.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the Super X8DTG-QF+ serverboard and the SC118GQ-R1800B chassis.

Chapter 2: Server Installation

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

Chapter 3: System Interface

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

Chapter 4: System Safety

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

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X8DTG-QF+ serverboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC118GQ-R1800B 1U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

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

Appendix A: BIOS POST Error Codes

Appendix B: System Specifications

Notes

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Chapter 1

Introduction

1-1 Overview

The SuperServer 1026GT-TRF series is a GPU-optimized server comprised of two main subsystems: the SC118GQ-R1800B 1U server chassis and the X8DTG-QF+ serverboard. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

- Ten 4-cm counter-rotating fans (FAN-0117L4)
- One air shroud (MCP-310-11801-0B)
- Two passive CPU heatsinks (SNK-P0037P)
- Riser Cards
  One RSC-R1UG-E16B for PCI-Express 2.0 x16 card. left side (rear)
  One RSC-R1UG-E16A for PCI-Express 2.0 x16 card, left side (front)
  One RSC-R1UG-E16AR-X9 for PCI-Express 2.0 x16 card, right side
  One RSC-R1UG-E16R-X9 for PCI-Express 2.0 x16 card, above serverboard
- Three power cables for GPU cards (CBL-0333L)
- SATA Accessories
  One SAS backplane (BPN-SAS-118G-4)
  Four 35-cm SATA cables
  Four hot-swap drive carriers (MCP-220-00047-0B)
- One rail set (MCP-290-00054-0N)
- One Super Server 1026GT-TRF User's Manual

1-2 Serverboard Features

At the heart of the SuperServer 1026GT-TRF server is the X8DTG-QF+, a dual processor serverboard based on the Intel 5520 chipset. Below are the main features of the X8DTG-QF+. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X8DTG-QF+ supports two Intel Xeon processor 5600/5500 series. Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X8DTG-QF+ has six DIMM slots that can support up to 96 GB of registered ECC or or up to 48 GB of unbuffered ECC/non-ECC DDR3-1333/1066/800 SDRAM. Modules of the same size and speed are recommended. See Chapter 5 for details.

Serial ATA

A SATA controller is integrated into the South Bridge (ICHR10R) section of the chipset to provide a six-port 3/Gbs SATA subsystem, which is 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 X8DTG-QF+ has four PCI-Express 2.0 x16 slots to support four GPU cards. In addition, there are two PCI-Express 2.0 x4 slots and two PCI-Express 2.0 x8 (one is low-profile) slots, which require the use of riser cards to support expansion cards.

Onboard Controllers/Ports

The color-coded I/O ports include one COM port (an additional COM header is located on the serverboard), a VGA (monitor) port, two USB 2.0 ports, two Gb Ethernet ports and one dedicated IPMI LAN port.

IPMI

IPMI (Intelligent Platform Management Interface) is a hardware-level interface specification that provides remote access, monitoring and administration for Supermicro server platforms. IPMI allows server administrators to view a server's hardware

status remotely, receive an alarm automatically if a failure occurs, and power cycle a system that is non-responsive.

1-3 Server Chassis Features

System Power

The SC118GQ-R1800B features a high-efficiency, redundant 1800W power supply composed of two separate power modules. This power redundancy feature allows you to replace a failed power supply without shutting down the system. See Chapter 6 for details.

SATA Subsystem

The SC118GQ-R1800B chassis includes four 2.5" drive bays, which may be used to house hot-swappable SATA drives. RAID 0, 1, 5 and 10 are supported (RAID 5 is not supported with Linux OS).

Front Control Panel

The control panel provides a system monitoring and control interface. LEDs indicate system power, HDD activity, network activity, and a system overheat/fan fail/ UID LED. A main power button and a system reset button are also included.

Cooling System

The SC118GQ-R1800B has an innovative cooling design that includes ten 4-cm counter-rotating PWM (Pulse Width Modulated) fans. The power supply modules also include a cooling fan. All chassis and power supply fans operate continuously. An air shrouds is included to further help cool the GPUs. See note on the following page regarding fan control.

1-4 GPU Subsystem

The 1026GT-TRF server represents one of Supermicro's massively parallel processing dual-GPU servers, with support for up to three GPUs. NVIDIA® Fermi™ GPUs place this system at the forefront of today's GPU computing solutions.

Please refer to the NVIDIA web site (www.nvidia.com) for details on Fermi GPUs.

Notes

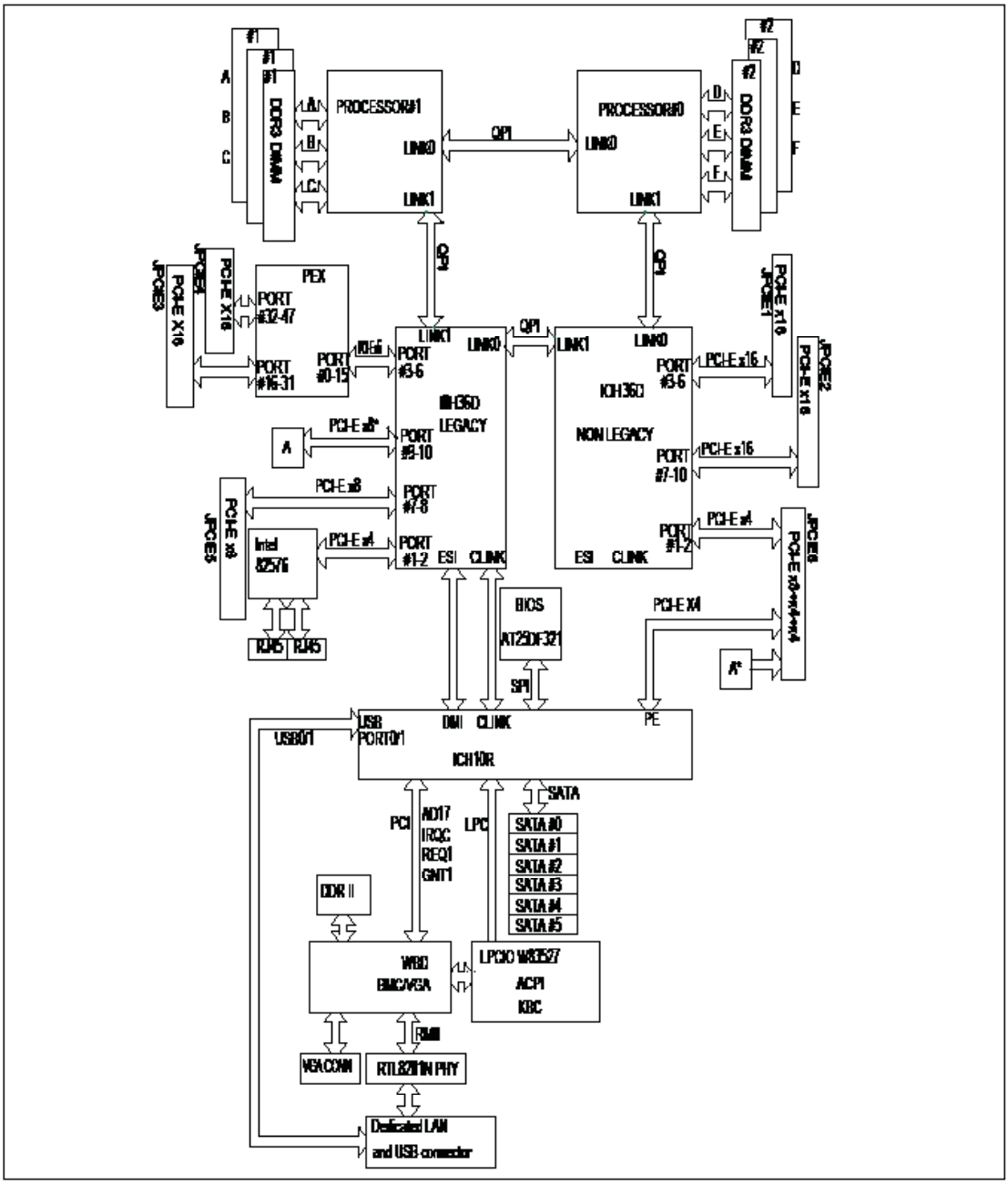
The GPUs process complex image calculations and then route the data out through the VGA port on the serverboard.

The 1026GT-TRF can support three standard size (double-width) GPUs (M2075 or M2090 only).

The GPUs can be bundled with the system.

Figure 1-1. Intel 5520 Chipset:
System Block Diagram

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



1-5 Contacting Supermicro

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Fax:	+886-(2) 8226-3991
Web Site:	www.supermicro.com.tw
Technical Support:	
Email:	support@supermicro.com.tw
Tel:	886-2-8226-5990

Chapter 2

Server Installation

2-1 Overview

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

2-2 Unpacking the System

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

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

2-3 Preparing for Setup

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

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

- This product is not suitable for use with visual display work place devices acccording to §2 of the the German Ordinance for Work with Visual Display Units.

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.
- Rack-mounted equipment should not be used as a shelf or work space.

Server Precautions

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

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

Rack Mounting Considerations

Ambient Operating Temperature

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

Reduced Airflow

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

Mechanical Loading

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

Circuit Overloading

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

Reliable Ground

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

2-4 Installing the System into a Rack

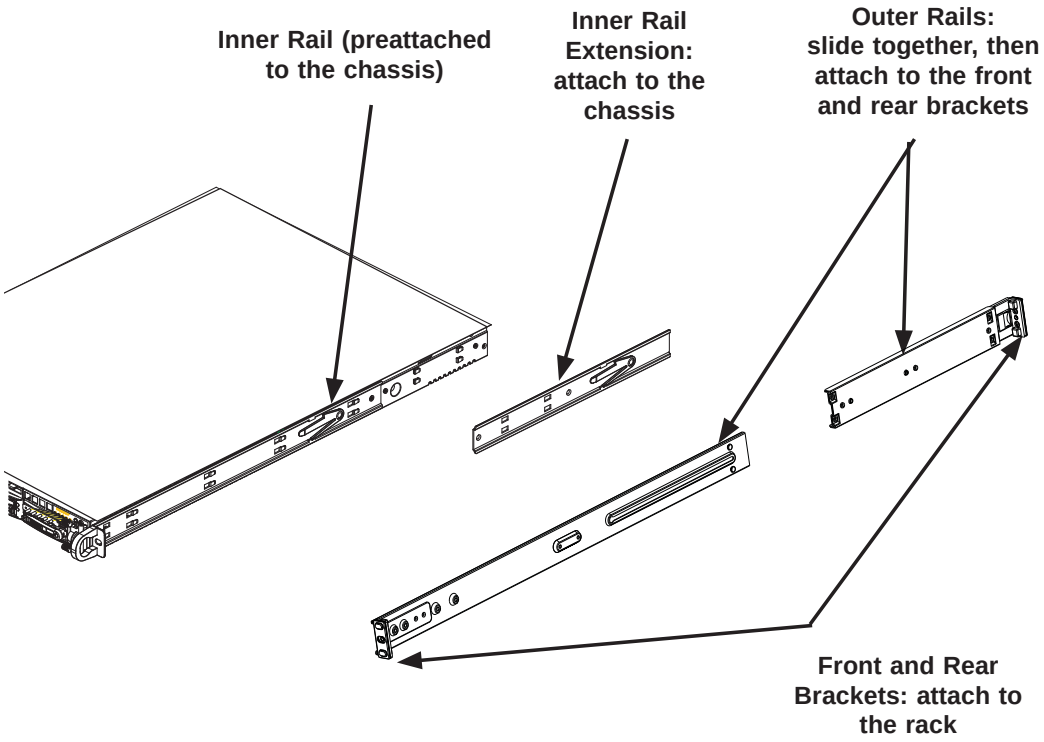
This section provides information on installing the SC118GQ chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean that the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack 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



Installing the Inner Rail Extensions

The SC118GQ chassis includes a set of inner rack rails in two sections: inner rails (A) and inner rail extensions (B). The inner rails are preattached and do not interfere with normal use of the chassis if you decide not to install to a server rack. Attaching the inner rail extensions to to the inner rails stabilizes the chassis within the rack.

Installing the Inner Rail Extensions

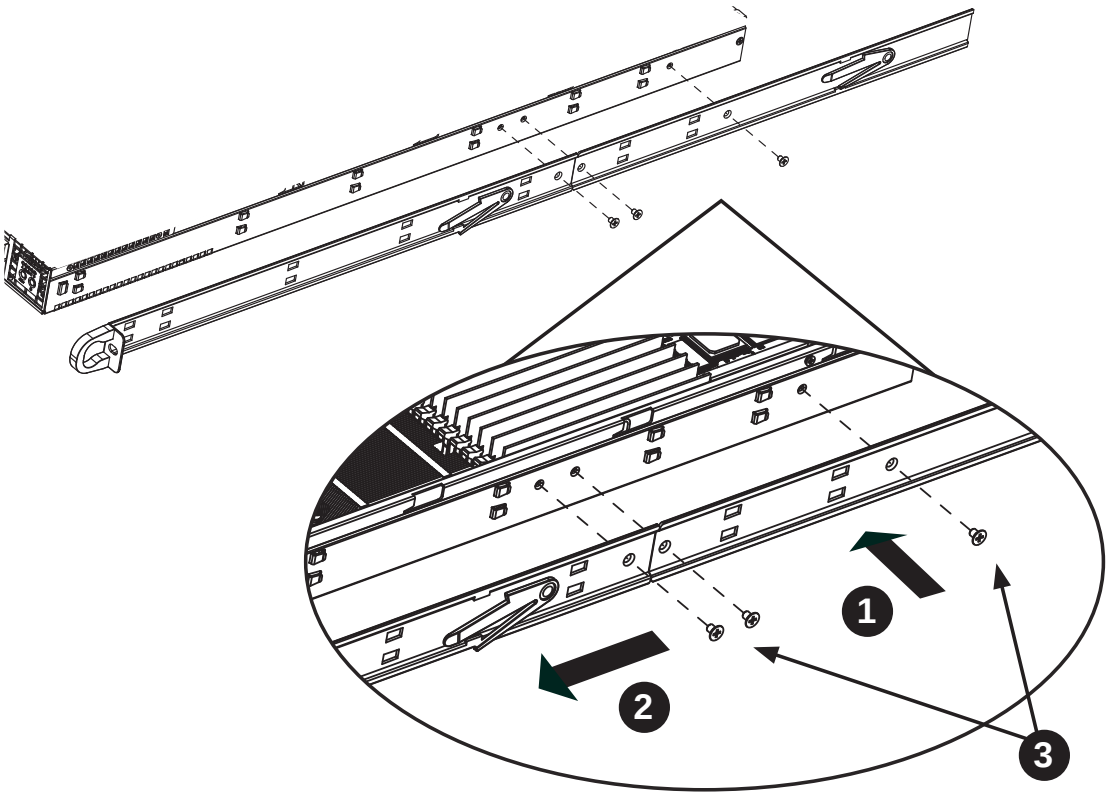
1. Place the inner rail extensions (B) over the preattached inner rails (A) which are attached to the side of the chassis. Align the hooks of the inner rail with the rail extension holes. Make sure the extension faces "outward" just like the inner rail.

2. Slide the extension toward the front of the chassis.

3. Secure the chassis with screws as illustrated.

4. Repeat steps 1-3 for the other inner rail extension.

Figure 2-2. Installing the Inner Rails



Assembling the Outer Rails

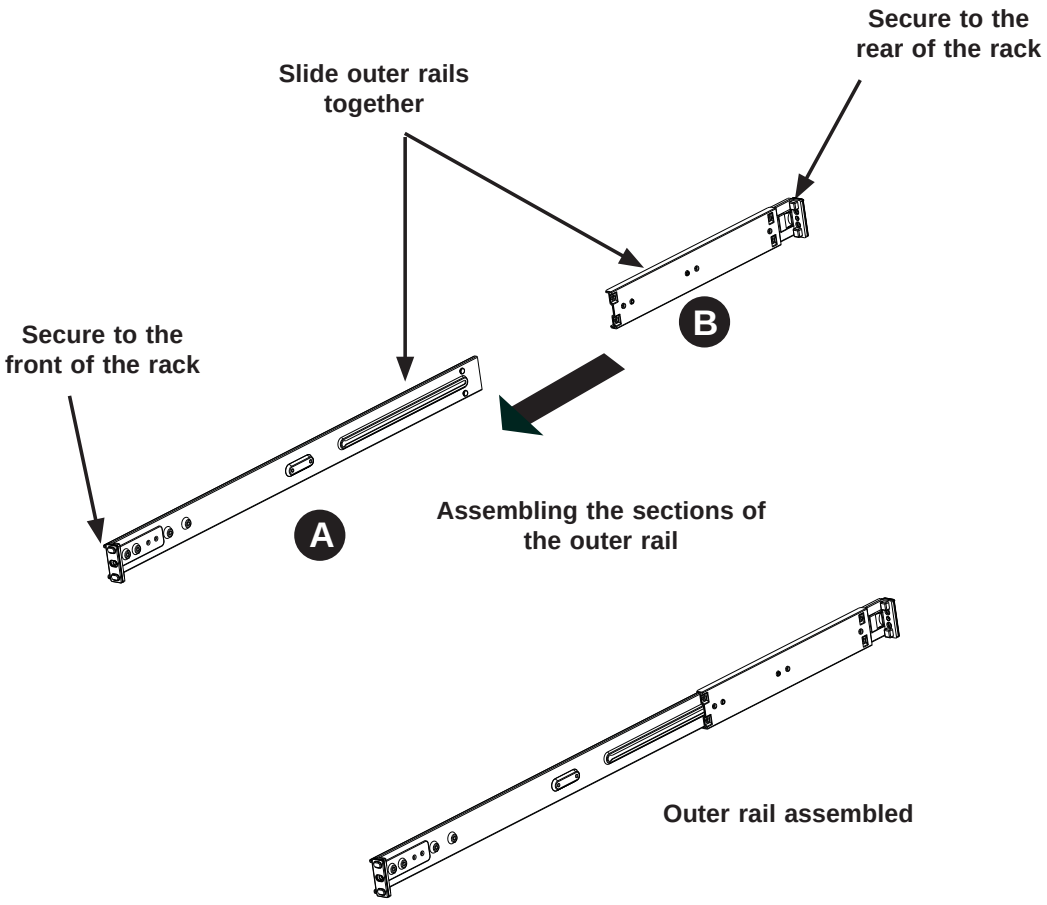
Each outer rail is in two sections that must be assembled before mounting on to the rack.

Assembling the Outer Rails

1. Identify the left and right outer rails by examining the ends, which bend outward.

2. Slide the front section of the outer rail (A), into the rear section of the outer rail (B).

Figure 2-3. Assembling the Outer Rails



Installing the Outer Rails onto the Rack

Outer Rail Installation

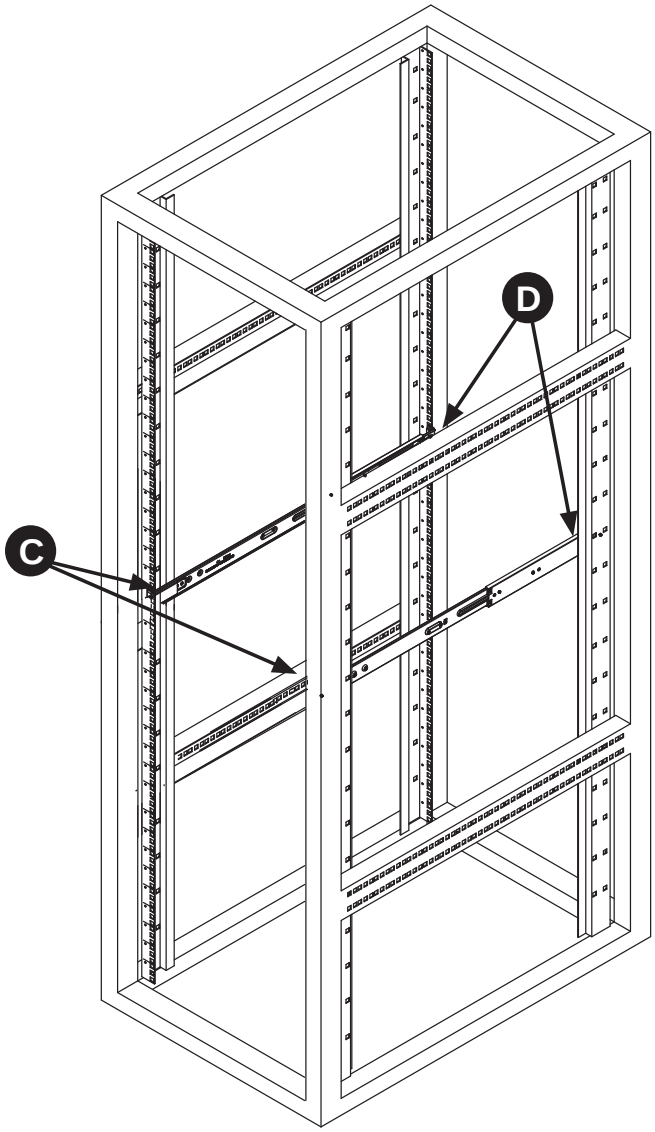
1. Adjust the outer rails to the proper length so that the outer rail fits snugly within the rack.

2. Align the holes on the front of the outer rail, with the holes on the front of the rack (C) and secure with the screws provided.

3. Align the holes on the rear of the outer rail to the holes on the rack (D) and secure with the screws provided.

4. Repeat the procedure with the second outer rail assembly.

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



Installing and Removing the Chassis From a Rack

Installation into a Rack

1. Slide the inner rail extensions into the front of the outer rails.

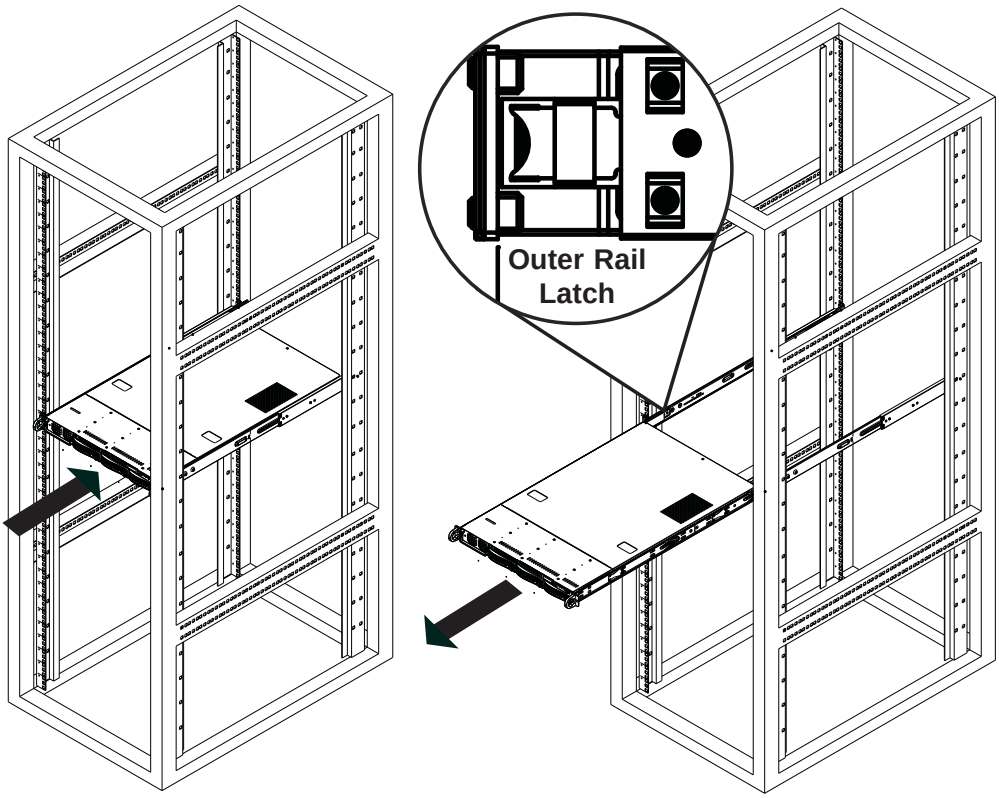
2. Push the chassis backward into the rack until it clicks into the locked postion.

Removing the Chassis From a Rack

1. Press the outer rail latch to release the chassis.

2. Carefully slide the chassis forward, off the outer rails and out of the chassis.

Figure 2-5: Chassis Installation **Figure 2-6: Chassis Removal**

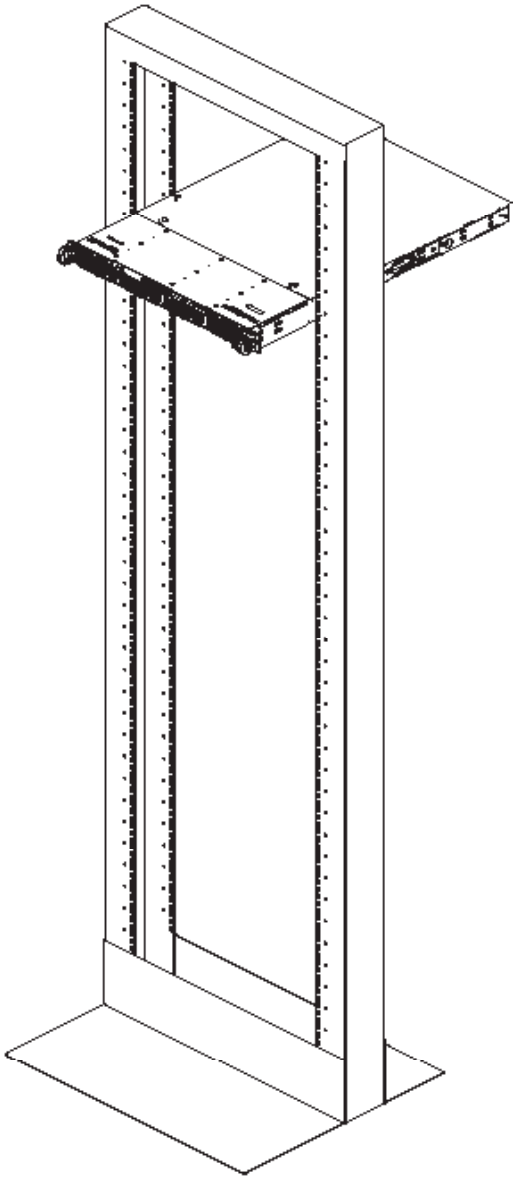


Installing the Server into a Telco Rack

Optional brackets (p/n MCP-290-00054-0N) are needed to install the server to a telco (open type) rack.

To install the server into a Telco type rack, use the 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 Server into a Telco Rack



Notes

Chapter 3

System Interface

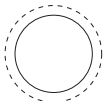
3-1 Overview

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

3-2 Control Panel Buttons

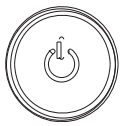
There are two push-buttons located on the front of the chassis: a reset button and a power on/off button.

RESET



Reset

Use the reset button to reboot the system.



Power

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

3-3 Control Panel LEDs

The two control panels are located on the front of the SC118GQ chassis. Each control panel has six 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..

Overheat/Fan Fail/UID LED

When this LED flashes it indicates a fan failure. When continuously on (not flashing) 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 that all fans are present and operating normally. Also check to make sure that the air shrouds are installed and that the top cover is on. Finally, verify that the heatsinks are installed properly. This LED will remain flashing or on as long as the overheat condition exists. When used with a UID-compatible motherboard, the UID function is used to turn on or off the blue light function of the the LED. Once the blue light is activated through the system software, the unit can be easily located in very large racks and server banks.

NIC2

Indicates network activity on GLAN2 when flashing .

NIC1

Indicates network activity on GLAN1 when flashing .

HDD

This light indicates SATA and/or peripheral 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 Drive Carrier LEDs

- **Green:** Each hard drive carrier (for use with SATA drives) has a green LED. When illuminated, this green LED (on the front of the SATA drive carrier) indicates drive activity. A connection to the backplane enables this LED to blink on and off when that particular drive is being accessed. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

- **Red:** The red LED to indicate a SATA drive failure. If one of the SATA drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Note: power should always be disconnected before performing any service on the system.

Basic electrical safety precautions shall be followed to protect yourself from harm and the server from damage:

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

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

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

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

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

4-2 General Safety Precautions

Follow these rules to ensure general safety:

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

- The server weighs approximately 37 lbs. (16.8 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.

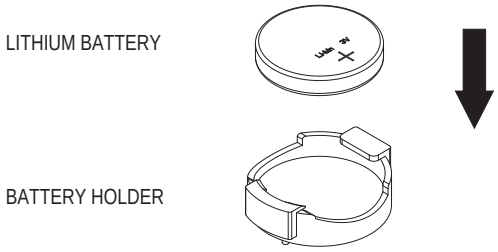
- Put the serverboard and peripherals back into their antistatic bags when not in use.

- 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 system is operating to ensure 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 install the X8DTG-QF+ serverboard into the chassis, 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 Electrostatic Discharge (ESD).
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the 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 Serverboard Installation

This section explains the first step of physically mounting the X8DTG-QF+ into the SC118GQ chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the serverboard, follow the procedure in reverse order.

Installing to the Chassis

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

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

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

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

5. Install the processors and make all necessary cable connections, as described in the sections that follow.

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

5-3 Connecting Cables

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

Connecting Data Cables

The ribbon 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 5-12 for connector locations.)

- SATA drive data cable (I-SATA0 ~ 3)
- SATA sideband cables (J19)
- Control Panel cable (JF1)
- GPU power cables (JPW3, JPW7, JPW8)

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

Connecting Power Cables

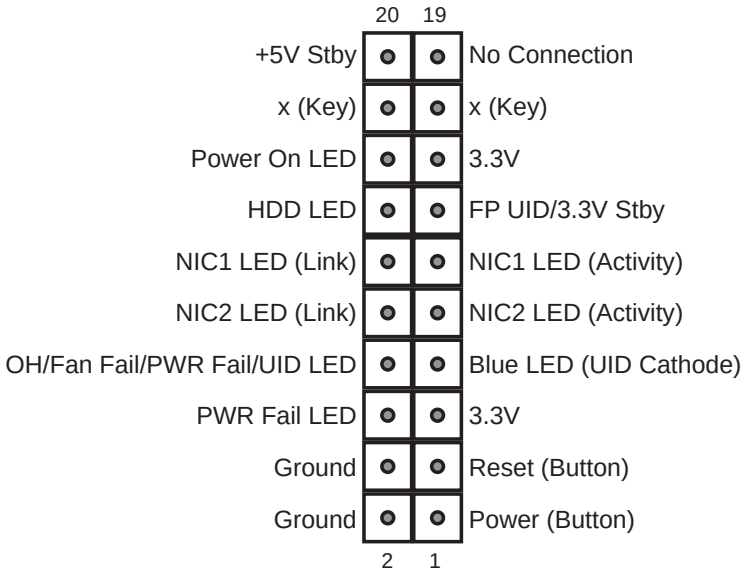
The X8DTG-QF+ has two proprietary power supply connectors (JPW1 and JPW9) for connection to the ATX power supply. See Section 5-8 for power connector pin definitions.

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

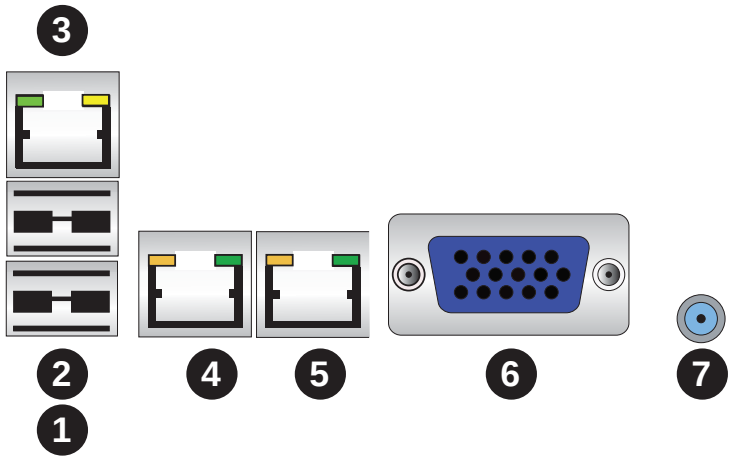
Figure 5-1. Control Panel Header Pins



5-4 I/O Ports

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

Figure 5-2. I/O Ports



IO Ports			
1.	USB Port 0	5.	LAN Port 2
2.	USB Port 1	6.	VGA Port
3.	IPMI Dedicated LAN	7.	UID Button
4.	LAN Port 1		

5-5 Installing the Processor and Heatsink

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

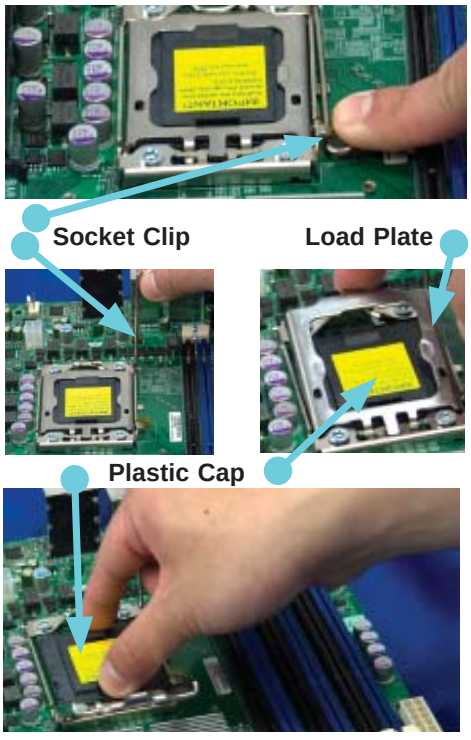
Notes:

- Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.
- Make sure to install the 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 LGA1366 Processor

1. Press the socket clip to release the load plate, which covers the CPU socket, from its locked position.
2. Gently lift the socket clip to open the load plate.
3. Hold the plastic cap at its north and south center edges to remove it from the CPU socket.

Note: The photos on this page and succeeding pages are for illustration purposes only. They do not necessarily reflect the exact product(s) described in this manual.



Holding the north & south edges

1. After removing the plastic cap, use your thumb and the index finger to hold the CPU at the north and south center edges.

2. Align the CPU key (the semi-circle cutout) with the socket key (the notch below the gold color dot on the side of the socket).

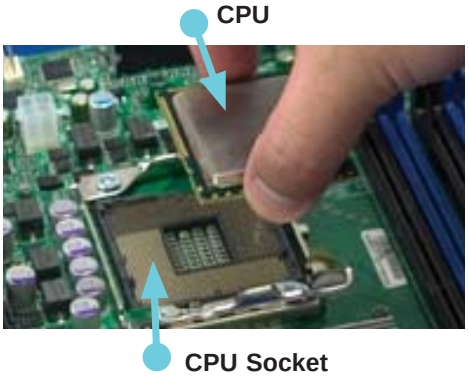
3. Once the CPU and the socket are aligned, carefully lower the CPU straight down into the socket. Do not rub the CPU against the surface of the socket or its pins to avoid damaging the CPU or the socket.

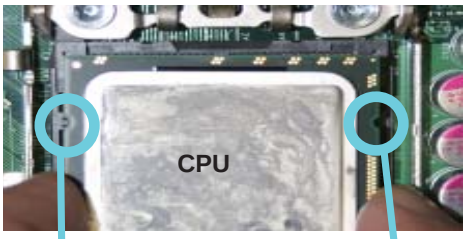
4. With the CPU in the socket, inspect the four corners of the CPU to make sure that it sits level and is properly installed.

5. Once the CPU is securely seated in the socket, lower the CPU load plate to the socket.

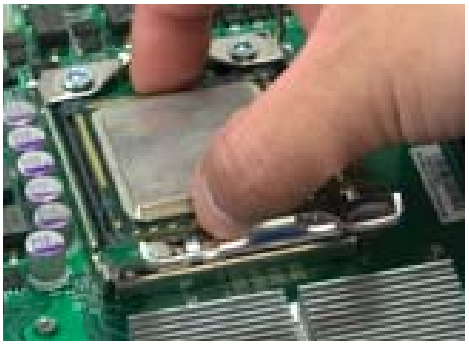
6. Use your thumb to gently push the socket clip down to the clip lock.

Important! Please save the plastic cap. The serverboard must be shipped with the plastic cap properly installed to protect the CPU socket pins. Shipment without the plastic cap properly installed may cause damage to the socket pins.

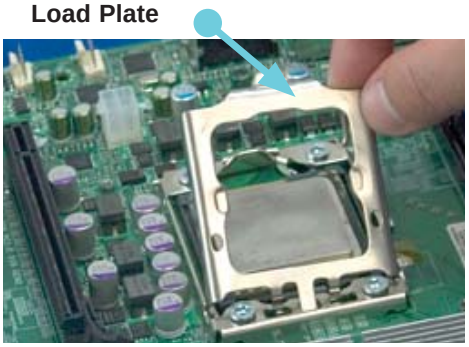




Align CPU keys with socket keys.



Load Plate



Installing a CPU Heatsink

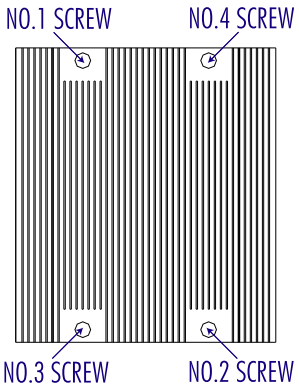
1. Remove power from the system and unplug the AC power cord from the power supply.

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

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

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

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



Removing the Heatsink

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

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

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

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

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

5-6 Installing Memory

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

Memory Support

The X8DTG-QF+ supports up to 96 GB of registered ECC or up to 48 GB of unbuffered ECC/non-ECC DDR3-1333/1066/800 MHz SDRAM in 6 DIMM slots. See the following tables for memory installation.

Notes: With unbuffered ECC/non-ECC memory, 8 GB is the maximum DIMM size that can be supported per slot.

Memory speed support is dependent on the type of CPU used on the board.

Installing Memory Modules

1. Insert the desired number of DIMMs into the memory slots, starting with P1-DIMM 1A. For best memory performance, please install memory modules of the same type and same speed on the memory slots as indicated on the tables below.

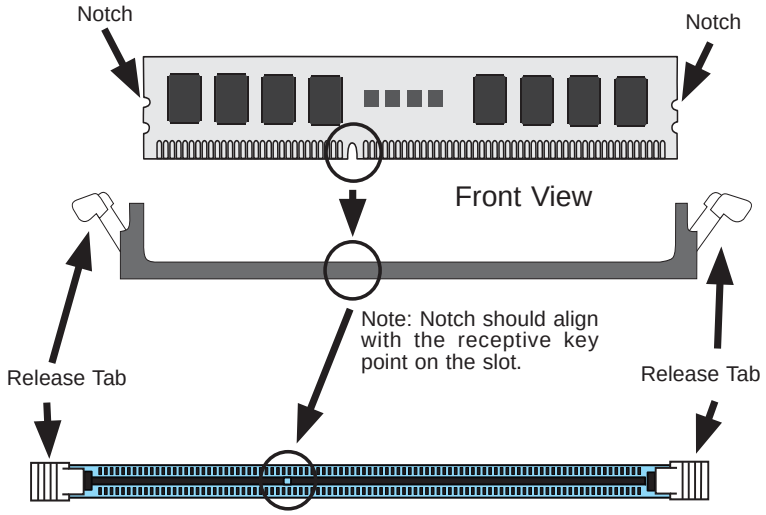
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to avoid installing incorrectly (see Figure 5-4).

3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

Figure 5-3. DIMM Installation

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

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



Optimal Memory Population with a Single (CPU1) Installed			
	Branch 0	**Branch 1**	**Branch 2**
3 DIMMs	P1 DIMM1	P1 DIMM2	P1 DIMM3

Optimal Memory Population with a Single (CPU2) Installed			
	Branch 0	**Branch 1**	**Branch 2**
3 DIMMs	P2 DIMM1	P2 DIMM2	P2 DIMM3

Optimal Memory Population with Two CPUs Installed						
	CPU1			**CPU2**		
	Branch 0	**Branch 1**	**Branch 3**	**Branch 0**	**Branch 1**	**Branch 3**
6 DIMMs	P1 DIMM1	P1 DIMM2	P1 DIMM3	P2 DIMM1	P2 DIMM2	P2 DIMM3

DIMM Module Population Configuration

For memory to work properly, follow the tables below for memory installation.

RDIMM Population with 5500 Processors Installed			
DIMMs Populated per Channel	**DIMM Type (Reg.= Registered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
1	Reg. DDR3 ECC	800,1066,1333	SR or DR
1	Reg. DDR3 ECC	800,1066 (Note 1)	QR
Note 1: 1333 RDIMMs will run at 1066 MHz (BIOS automatically downgrades). **Note 2:** 1333/1066 RDIMMs will run at 800 MHz (BIOS automatically downgrades).			

UDIMM Population with 5500 Processors Installed			
DIMMs Populated per Channel	**DIMM Type (Unb.= Unbuffered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
1	Unb. DDR3 ECC/Non-ECC	800,1066,1333	SR or DR
1	Unb. DDR3 ECC/Non-ECC	800,1066 (Note)	Mixing SR, DR
Note: 1333 UDIMMs will run at 800 MHz (BIOS automatically downgrades).			

1.5V RDIMM Population with 5600 Processors Installed			
DIMMs Populated per Channel	**DIMM Type (Reg.= Registered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
1	Reg. DDR3 ECC	800,1066,1333	SR or DR
1	Reg. DDR3 ECC	800 , 1066	QR
Note 1: 1333 RDIMMs MHz will run at 1066 MHz (BIOS automatically downgrades). **Note 2:** 1333/1066 RDIMMs MHz will run at 800 MHz (BIOS automatically downgrades) **Note 3:** MIxing of 1.35V and 1.5V DIMMs is not recommended.			

1.5V UDIMM Population with 5600 Processors Installed			
DIMMs Populated per Channel	**DIMM Type (Unb.= Unbuffered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
1	Unb. DDR3 ECC/Non-ECC	800,1066,1333	SR or DR
Note 1: 1333 MHz for two DIMMs per channel is supported when Unbuf./ECC DIMMs are used. **Note 2:** MIxing of 1.35V and 1.5V DIMMs is not recommended.			

- 1.35V DIMMs

1.35V RDIMM Population with 5600 Processors Installed			
DIMMs Populated per Channel	**DIMM Type (Reg.= Registered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
1	Reg. DDR3 ECC	800,1066,1333	SR or DR
1	Reg. DDR3 ECC	800 (Note 1)	QR
Note 1: 1333/1066 QR RDIMMs MHz will run at 800 MHz (BIOS automatically downgrades). **Note 2:** 1333 SR/DR RDIMMs MHz will run at 800 MHz (BIOS automatically downgrades). **Note 3:** 1333 SR/DR/QR RDIMMs MHz will run at 800 MHz (BIOS automatically downgrades). **Note 4:** MIxing of 1.35V and 1.5V DIMMs is not recommended.			

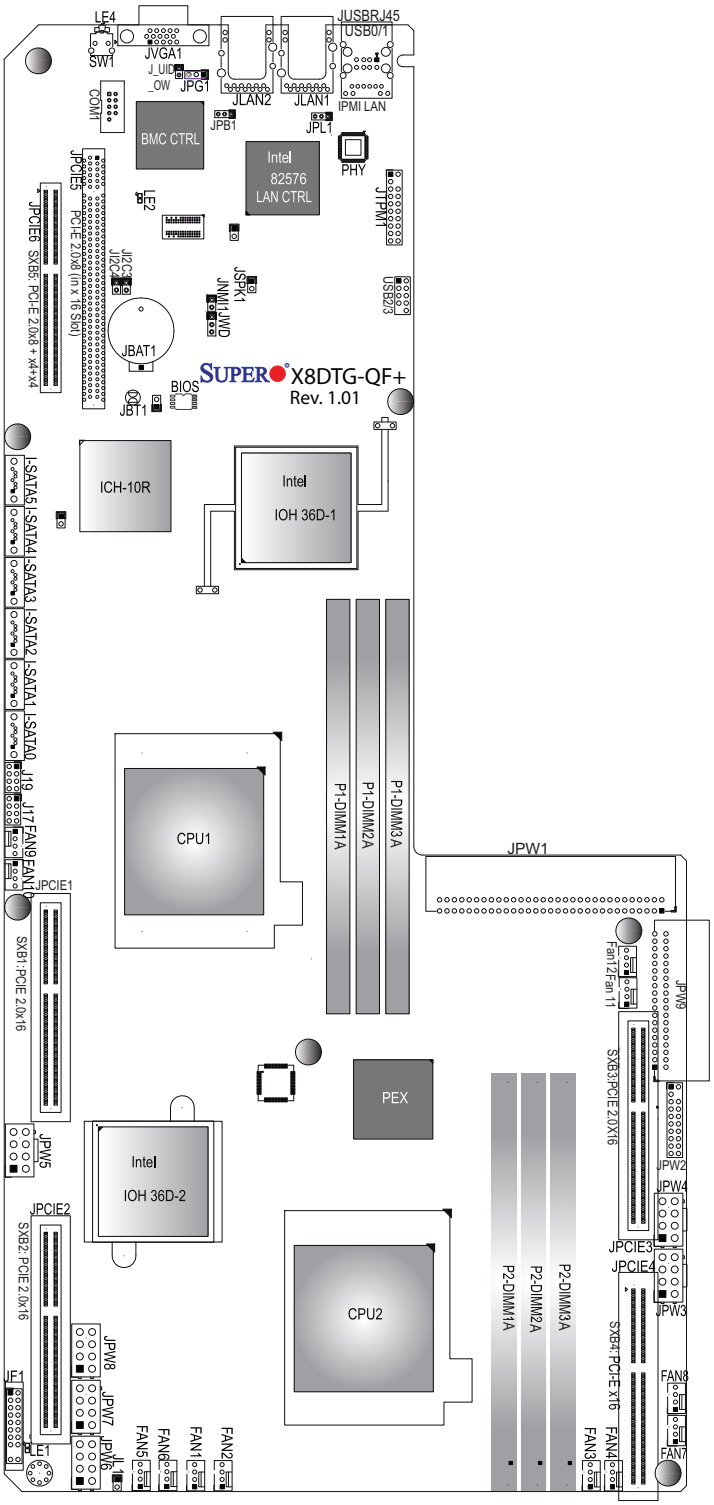
5-6 Expansion Cards

Besides offering support for three GPU cards, the 1026GT-TRF supports one PCI-Express 2.0 x8 (in x16 slot). A riser card is required to support expansion cards.

Refer to Chapter 6 for instructions on installing expansion cards to the system..

5-7 Serverboard Details

Figure 5-5. X8DTG-QF+ Layout



Notes

Jumpers not indicated are for test purposes only.

"■" indicates the location of Pin 1.

X8DTG-QF+ Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	(See Section 5-9)
JI²C3/JI²C4	SMB to PCI-Express Slots Enable/Disable	Open (Disabled)
JPB1	BMC (Baseboard Management Control) Enable/Disable	Pins 1-2 (Enabled)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	LAN1/2 Enable/Disable	Pins 1-2 (Enabled)
J_UID_OW	Red LED OW (Pins 7/8 of JF1)	Off (Overwrites)
JWD	Watch Dog	Pins 1-2 (Reset)

Connector	Description
COM1	COM1 Serial Header
FAN1~12	System/CPU Fan Headers
I-SATA0 ~ 5	SATA Ports 0~5
J17, J19 (T_SGPIO 1/2)	Serial Link General Purpose I/O Headers 1/2
JBAT1	Onboard Battery (See Chapter 4 for disposal info.)
JF1	Front Panel Header
JL1	Chassis Intrusion Header
JLAN1/JLAN2	Gigabit Ethernet LAN Ports 1/2
JNMI1	NMI (Non-Maskable Interrupt) Header
JPCIE 1~4	SXB 1/2/3/4 PCI-E 2.0 x16 Slots
JPCIE 5, JPCIE 6	JPCIE6: SXB5 PCI-E 2.0 x8 + x4 + x4/JPCIE5: PCI-E 2.0 x8 in x16
JPW1	SMC Proprietary Main Onboard Power Supply Connector
JPW2	SMC Proprietary Power Connector
JPW3/4, JPW5, JPW7/8	8-Pin Power Connectors for External Devices
JPW6	8-Pin Midplane SATA Power Connector
JSPK1	Internal Speaker Header
JTPM1	TPM (Trusted Platform Module) Port80 Header
USB2/3	USB Port 2/3 Header
JUSBRJ45	Back Panel IPMI LAN Port and USB 0/1 Connections
JVGA1	Video Port
SW1	UID (Unit Identifier) Switch

LED	Description
LE1	Onboard Standby PWR warning LED Indicator
LE2	BMC Heartbeat LED Indicator
LE4	UID LED Indicator

5-8 Connector Definitions

Power Connectors

Two SMC-proprietary power connectors are located at JPW1/JPW9 to provide main power to the motherboard. In addition, JPW6, located next to the Front Controller Panel, is used to provide power to the SATA devices installed on the midplane. Six additional 8-pin power connectors, located at JPW3~5, JPW7~8 and JPW11, are used for external devices. Be sure to connect these power connectors to your power supply to provide adequate power supply to your system.

12V 8-pin PWR Connector Pin Definitions

Pins	Definition
1 through 3	+12V
4 through 8	Ground

JPW1: SMC-Proprietary Main PWR
JPW9: SMC-Proprietary Main PWR
JPW2: Flat Power Cable
JPW3: 8-pin PWR used for External Devices
JPW4: 8-pin PWR used for External Devices
JPW5: 8-pin PWR used for External Devices
JPW6: 8-pin PWR used for SATA Devices
JPW7: 8-pin PWR used for External Devices
JPW8: 8-pin PWR used for External Devices
JPW11: 8-pin PWR used for External Devices

Power Button Connector

The PW_ON connector is on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS, see Chapter 7). To turn off the power when set to suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions. This header should be connected to the chassis power button. See the table on the right for pin definitions.

Power Button Pin Definitions (JF1)

Pin#	Definition
1	Power Button
2	Ground

Reset Connector

The reset connector is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)

Pin#	Definition
3	Reset
4	Ground

Power Fail LED

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

PWR Fail LED Pin Definitions (JF1)

Pin#	Definition
5	3.3V
6	PWR Fail LED

Overheat/Fan Fail/UID LED

Connect an LED cable to pins 7 and 8 of JF1 for the Overheat/Fan Fail and UID LED connections. The red LED (pin 8) provides warning of an overheat or fan failure. The blue LED (pin 7) works as the UID LED indicator for the front panel UID button located on pins 13~14 of JF1. When Jumper J_UID_OW is set to off (default), the red LED takes precedence over the blue LED. Refer to the tables on the right for more information.

OH/Fan Fail/Blue_UID LED Pin Definitions (JF1)

Pin#	Definition
7	Blue_LED-Cathode(UID)/5.5V.SB
8	OH/Fan Fail/UID LED (Red)

OH/Fan Fail LED Status (Red LED)

State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

NIC2 (JLAN2) LED

The LED connections for JLAN2 are on pins 9 and 10 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)

Pin#	Definition
9	Activity LED
10	Link LED

NIC1 (JLAN1) LED

The LED connections for JLAN1 are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)

Pin#	Definition
11	Activity LED
12	Link LED

HDD/FP UID Button

The HDD/UID button connections are located on pins 13/14 of JF1. Attach a hard-drive LED cable to display HDD or SATA activity. This connection can also be used for the front panel UID (Unit Identifier) button. (The UID LED on pin 7 of JF1 works in conjunction with the UID button.) When the user presses and releases the UID button, the UID LED will be turned on or off to indicate the location of the unit in a stack or rackmounted servers.

HDD/UID LED Pin Definitions (JF1)

Pin#	Definition
13	UID Signal/3.3V
14	HDD Activity

Power On LED

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

Power LED Pin Definitions (JF1)

Pin#	Definition
15	+3.3V
16	Control

Fan Headers

The X8DTG-QF+ has twelve CPU/system fan headers (Fan1 ~ Fan12). All are 4-pin fan headers, which are backward compatible with traditional 3-pin fans. However, fan speed control is available for 4-pin fans only. Fan speed is controlled by Thermal Management via Hardware Monitoring in the BIOS (the default setting is Disabled). See the table on the right for pin definitions.

Fan Header Pin Definitions

Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	Pulse Width Modulation

Serial Ports

A COM Port (COM1) is located next to the UID switch to provide serial port support. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1)

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

NMI Header

The non-maskable interrupt header is located at JNMI1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions

Pin#	Definition
1	Control
2	Ground

Internal Buzzer

The Speaker header, located at JSPK1, can be used to provide audible alarms for various beep codes. See the table on the right for pin definitions.

Internal Buzzer Pin Definitions

Pin#	Definitions	
Pin 1	Pos. (+)	5V
Pin 2	Neg. (-)	Alarm Speaker

Chassis Intrusion

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

Chassis Intrusion Pin Definitions (JL1)

Pin#	Definition
1	Intrusion Input
2	Ground

T-SGPIO Headers

Two SGPIO (Serial-Link General Purpose Input/Output) headers (T-SGPIO-1/T-SGPIO-2) are located at J17/J19 on the motherboard. These headers support serial link interfaces for the onboard SATA connectors. See the table on the right for pin definitions.

T-SGPIO Pin Definitions

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

NC = No Connection

TPM Header/Port 80

A Trusted Platform Module/Port 80 header is located at JTPM1 to provide TPM and Port 80 support, which will 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	NC
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	NC	14	NC
15	+3V_DUAL	16	SERIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#	20	NC

Universal Serial Bus (USB)

Two Universal Serial Bus ports (USB0/1) are located on the I/O backplane. Connect USB devices to these USB ports.

Ethernet Ports

Two Ethernet ports are located next to the USB 0/1 on the IO backplane. In addition, an IPMI Dedicated LAN is located above the USB ports 0/1. These ports accept RJ45 type cables.

Note: Please refer to the LED Indicator Section for LAN LED information.

LAN Ports Pin Definition

Pin#	Definition	Pin#	Definitions
1	TD0+	11	TD3-
2	TD0-	12	PIV8_NIC
3	PIV8_NIC	13	ACT LED-
4	TD1+	14	ACT LED+
5	TD1-	15	Link 100 LED (Green)
6	PIV8_NIC	16	Link 1000 LED (Yellow)
7	TD2+	17	Ground
8	TD2-	18	Ground
9	PIV8_NIC	19	Ground
10	TD3+	20	Ground

Unit Identifier Switch

A Unit Identifier (UID) switch and two LED indicators are provided on the serverboard. The rear UID LED (LE4) is located next to the UID switch on the backplane. The front panel UID LED is on pins 7/8 of JF1. Connect a cable to pins 7/8 on JF1 for front panel UID indication. Pressing the UID switch will turn on both the rear and front UID LEDs. Pressing the UID switch again will turn off both LEDs. These UIDs provide easy identification of a system unit that may be in need of service.

Note: the UID can also be triggered via IPMI. Please refer to the IPMI User's Guide posted on our Website @http://www.supermicro.com.

UID LED (LE4) Status

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

UID Switch

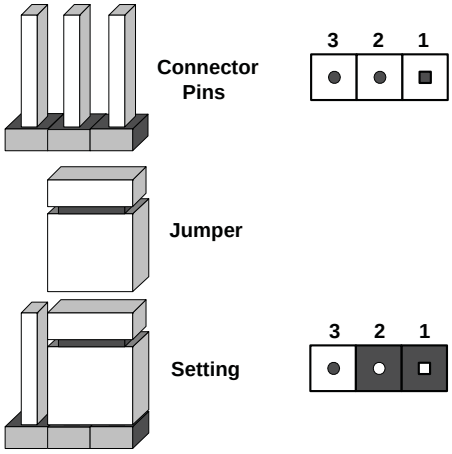
Pin#	Definition
1	Button In
2	Ground
3	Ground
4	Ground

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*.

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

LAN1/2 Enable/Disable

Change the setting of jumper JPL1 to enable or disable the LAN1/LAN2 Ethernet ports on the serverboard. See the table on the right for jumper settings. The default setting is enabled.

LAN1/2 Enable/Disable Jumper Settings

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

Watch Dog Enable/Disable

JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. 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.

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

Watch Dog Jumper Settings

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

J_UID_OW (Overwriting)

When J_UID_OW is set to open (default), the red LED (Overheat/Fan Fail/PWR Fail/ UID LED) located on pin 8 of the Front Control Panel (JF1) will take precedence over the Blue UID_LED located on pin 7 of JF1. (That is, when the red LED is on the blue LED will be turned off. When the red LED is off, the blue UID_LED can be on or off.) In other words, the red LED signal overwrites the blue UID_LED signal if J_UID-OW is set to off. When the jumper J_UID_OW is closed, the red LED and the Blue_UID_LED work independently of each other and the red LED will have no effect on the blue LED. See the table for jumper settings.

J_UID-OW (Overwriting) Jumper Settings

Jumper	Definition
Open	Red Fail LED overwrites the Blue UID LED Red LED: On, Blue LED: Off, Red LED: Off, Blue LED: On or Off
Closed	Red LED does not overwrite and has no effect on the Blue UID LED Red LED: On, Blue LED: On,Off Red LED: Off, Blue LED: On, Off

BMC Enable/Disable

Use jumper JPB1 to enable or disable the BMC (Baseboard Management Controller), which supports IPMI 2.0/KVM. See the table on the right for jumper settings.

BMC Enable/Disable Jumper Settings	
Both Jumpers	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

5-10 Onboard Indicators

LAN1/2 Port LEDs

The Ethernet ports have two LEDs. On each port, one LED indicates activity while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

Note: the dedicated IPMI LAN does not operate at 1 Gb/s.

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

Onboard Power LED (LE1)

An Onboard Power LED is located at LE1. This LED Indicator is on when the system is on. Be sure to unplug the AC power cable 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 (power cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State

Dedicated IPMI LAN Port LEDs

A 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. Please note that the IPMI LAN does not support 1Gbps connections. See the table at right for more information.

IPMI LAN LEDs		
	Color/State	Definition
Link (Left)	Green: Solid	100 Mbps
Activity (Right)	Amber: Blinking	Active

Onboard Power LED

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

Onboard PWR LED Indicator States

LED Color	Definition
Off	System Off (PWR cable is not connected or the power switch is off)
Green	System On
Green: Flashing	ACPI S1 State

BMC Heartbeat LED

The BMC Heartbeat LED is designated LE2. When LE2 is blinking, the BMC (Baseboard Management Controller) is functioning normally. See the table at right for more information.

BMC Heatbeat LED Indicator LED Status

Green: Blinking	BMC: Normal

Rear UID LED

The rear UID LED is located at LE4 on the backplane. This LED is used in conjunction with the rear UID switch to provide easy identification of a system that might be in need of service.

UID LED Status

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

5-11 SATA Ports

SATA Ports

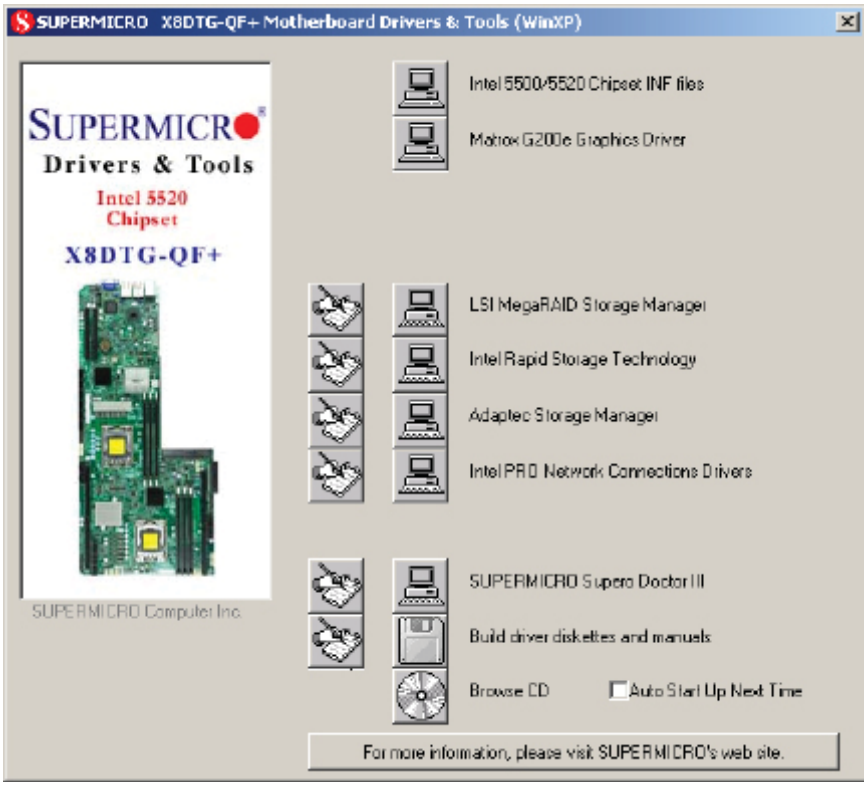
There are no jumpers to configure the onboard SATA ports. See the table on the right for pin definitions.

SATA Port Pin Definitions

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

5-12 Installing Software

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



Driver/Tool Installation Display Screen

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

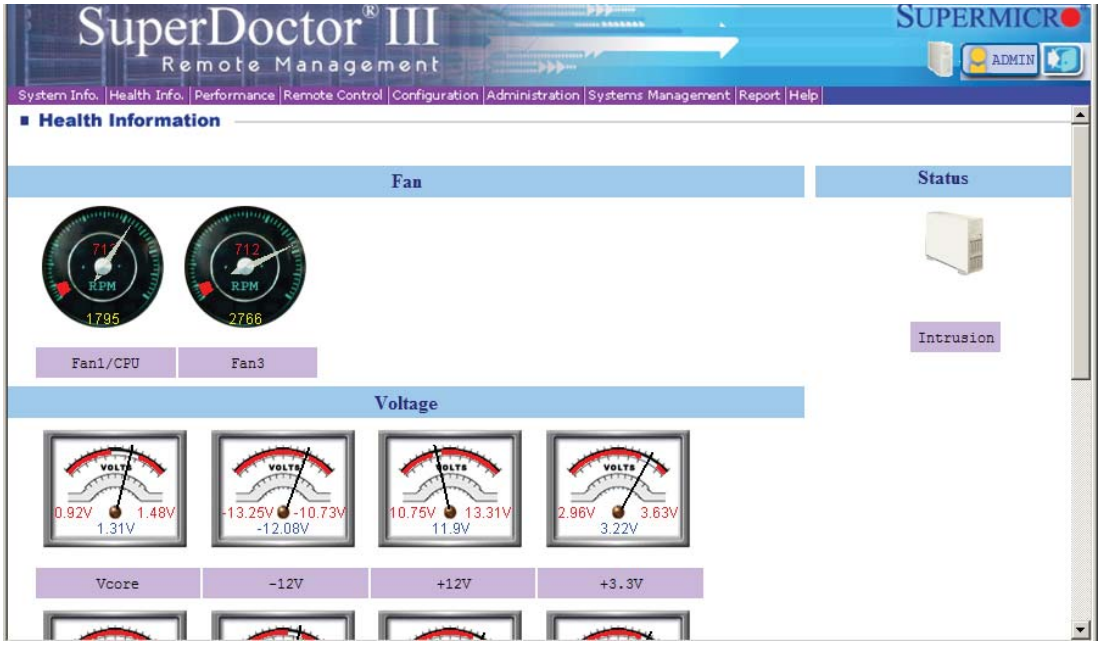
SuperDoctor III

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

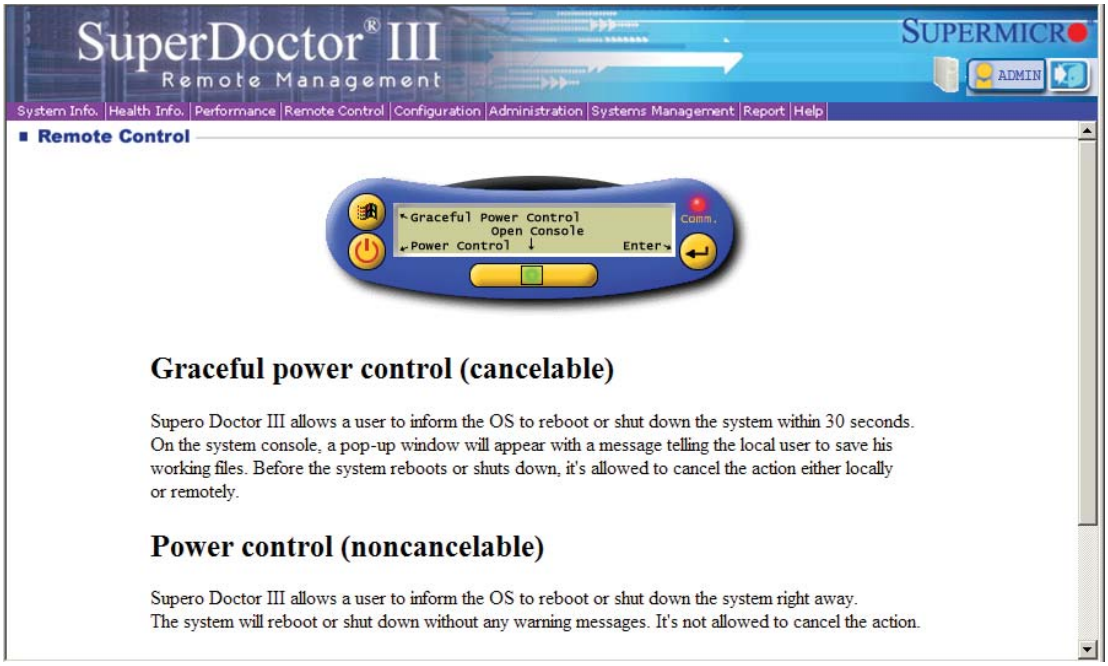
Note: The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

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

SuperDoctor III Interface Display Screen (Health Information)



SuperDoctor III Interface Display Screen (Remote Control)



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

For Linux, we recommend using SuperDoctor II.

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC118GQ chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the next step.

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

6-1 Static-Sensitive Devices

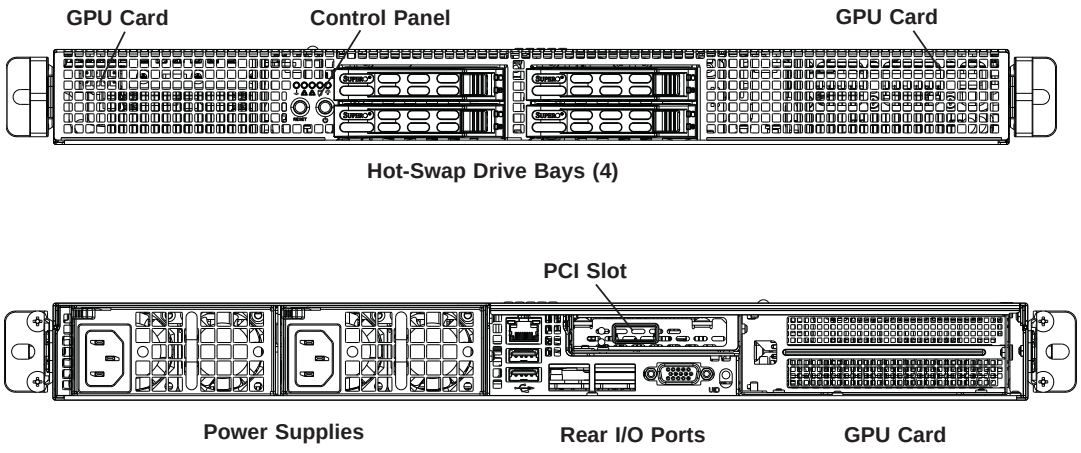
Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully.

The following measures are generally sufficient to protect your equipment from ESD damage.

Precautions

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

Figure 6-1. Chassis: Front and Rear Views



Note: the number of PCI slots available depend on the presence of GPUs in the server model.

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

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

6-3 System Cooling

Ten 4-cm counter-rotating fans provide the cooling for the system. Each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels.

It is very important that the chassis top cover is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis and cool the components.

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. 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). Failed fans can be identified through the BIOS. (See the fan numbering in Figure 6-3. These numbers are also imprinted on the floor of the chassis.)

Replacing a System Fan (Figure 6-2, 6-3)

1. If the BIOS is not being utilized to determine which fan has failed, open the top cover of the chassis while the system is running to locate the position of the failed fan. Never run the server for an extended period of time with the top cover open.

2. Turn off the power to the system and unplug the AC power cord.

3. Remove the failed fan's wiring from the serverboard.

4. Remove the four pins securing the fan to the fan tray.

5. Lift the failed fan from the fan tray and out of the chassis.

6. Place the new fan into the vacant space in the fan tray, 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 in the same fan tray.

7. Reconnect the fan wires to the exact same chassis fan headers as the previous fan.

8. Reconnect the AC power cord, power up the system and check that the fan is working properly before replacing the chassis cover.

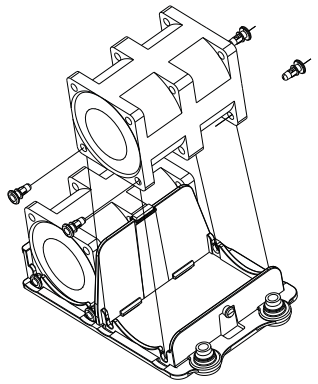


Figure 6-2. Removing a Fan from the Fan Tray

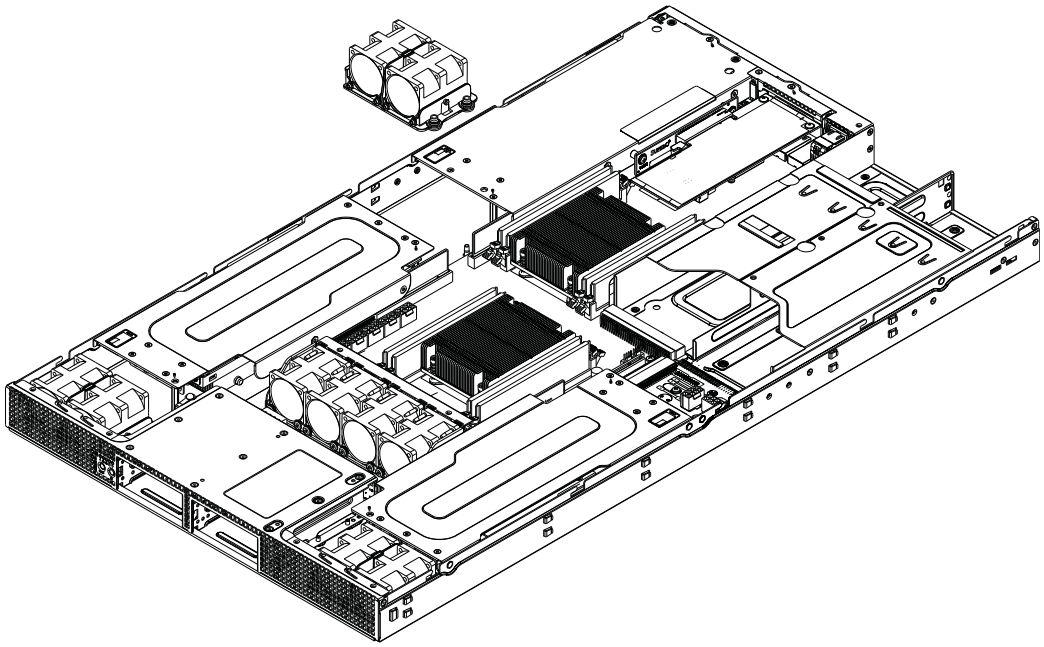


Figure 6-3: Installing a Fan

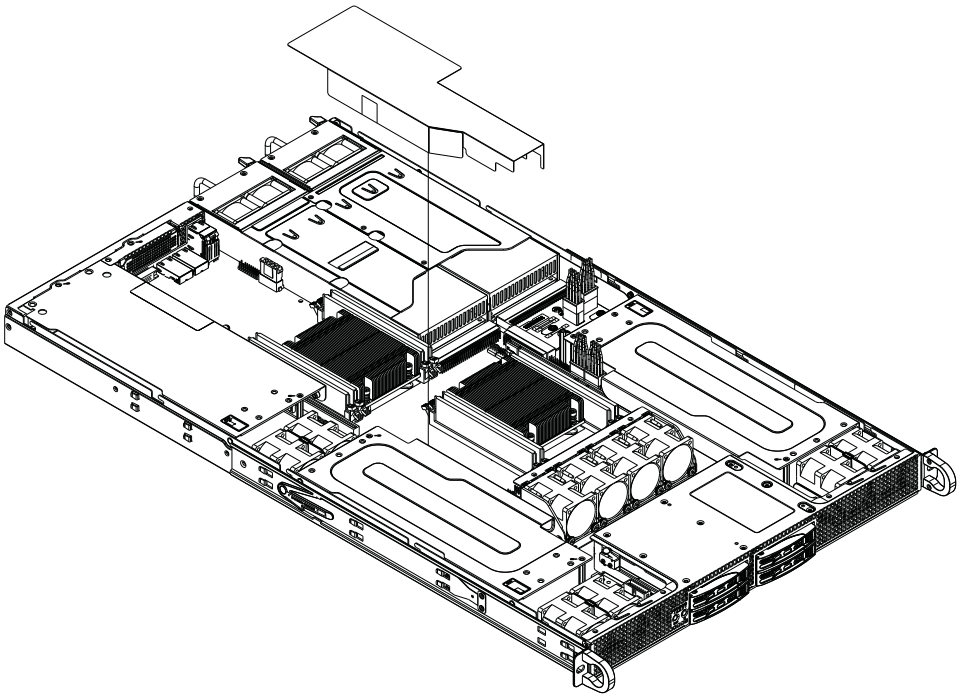


Figure 6-4: Installing the Air Shroud

Installing the Air Shroud

Air shrouds concentrate airflow to maximize fan efficiency. The SC118GQ chassis air shroud does not require screws to set up

Note: Each GPU card has its own air shroud.

Installing the Air Shroud

1. Position the air shroud in the chassis as illustrated in Figure 6-4.
2. Align the notch on the air shroud with the pin on the add-on card bracket.
3. Slide the pin into the back of the notch.
4. Lower the front of the air shroud over the fan tray, sliding the front notches over the pins on the fan tray.

6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

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.

Removing Hard Drive Carriers from the Chassis

1. Press the release button on the drive carrier. This extends the drive carrier handle.
2. Use the handle to pull the drive carrier out of the chassis.

Warning: Except for short periods of time (swapping hard drives), do not operate the server with the hard drive carriers removed.

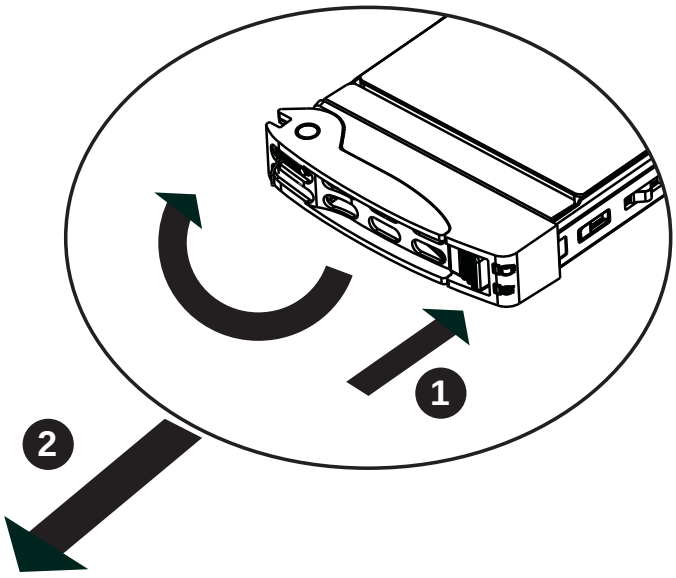


Figure 6-5: Removing a Hard Drive Carrier

Installing a Hard Drive into a Drive Carrier

1. Remove the dummy drive, which comes pre-installed in the drive carrier, by removing the screws securing the dummy drive to the carrier. Note that these screws cannot be reused on the actual 2.5" hard drive.

2. Insert a drive into the carrier with the PCB side facing down and the connector end toward the rear of the carrier.

3. 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.

4. Secure the drive to the carrier with four M3 screws as illustrated below. These screws are included in the chassis accessory box.

5. 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.

6. Push the handle in until it clicks into its locked position

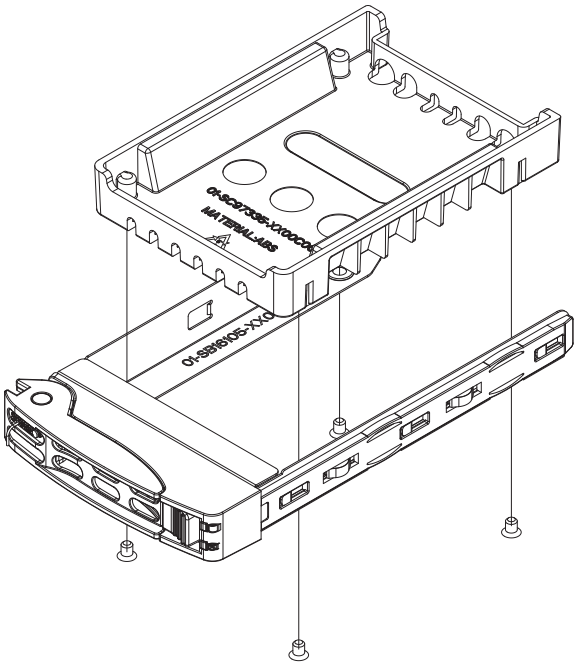


Figure 6-6: Installing a Hard Drive into a Carrier

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

6-5 Power Supply

The 1026GT-TRF series server includes an 1800 watt redundant power supply consisting of two power modules. Each power supply module has an auto-switching capability, which enables it to automatically sense and operate at a 100V - 240V input voltage.

If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption.

Replacement units can be ordered directly from Supermicro. The power supply units have a hot-swap capability, meaning you can replace the failed unit without powering down the system.

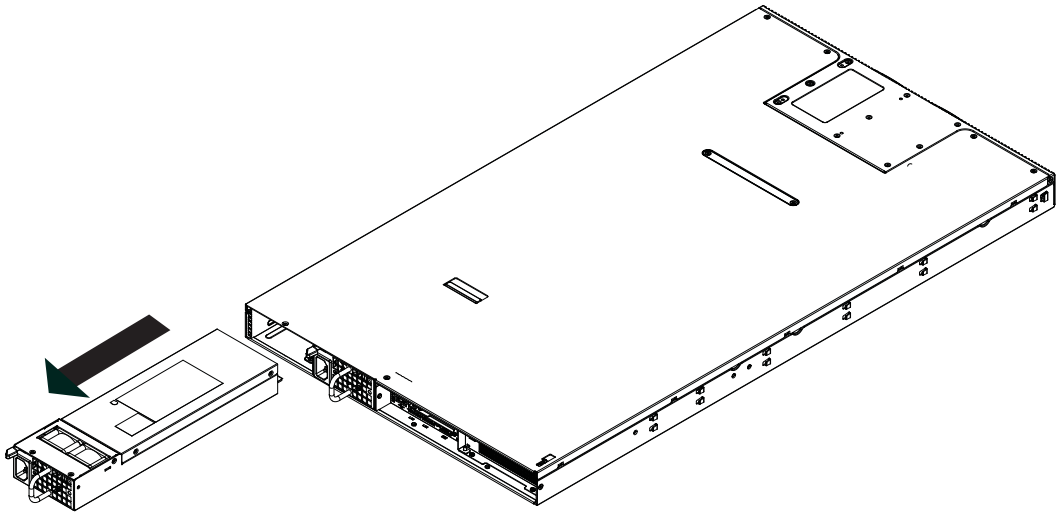


Figure 6-7: Removing the Power Supply

Replacing the Power Supply

1. First unplug the AC power cord from the failed power supply module.
2. To remove the failed power unit, remove the screws on the back of the power supply, which secure it to the chassis. You can then pull the unit straight out of the chassis.
3. Replace the failed unit with another of the exact same power supply.
4. Carefully insert the new unit into position in the chassis and secure it with the screws at the rear of the unit.
5. Reconnect the power cord.

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X8DTG-QF+. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Starting BIOS Setup Utility

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

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

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

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

Note 2: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.

How To Change the Configuration Data

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

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 other setup

screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

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

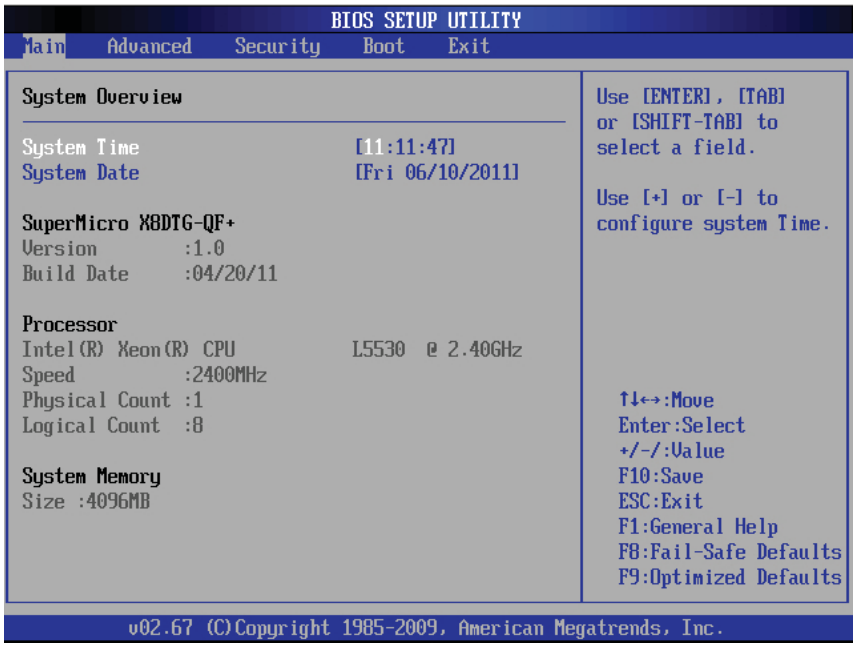
Note: For AMI BIOS Recovery, please refer to the AMI BIOS Recovery Instructions posted on our website at http://www.supermicro.com/support/manuals/.

7-2 Main Setup

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

System Overview: The following BIOS information will be displayed:

System Time/System Date



Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Enter new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in 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 X8DTG-QF+

- Version: This item displays the BIOS revision used in your system.
- Build Date: This item displays the date when this version of BIOS was completed.

Processor

The AMI BIOS will automatically display the status of the processor used in your system:

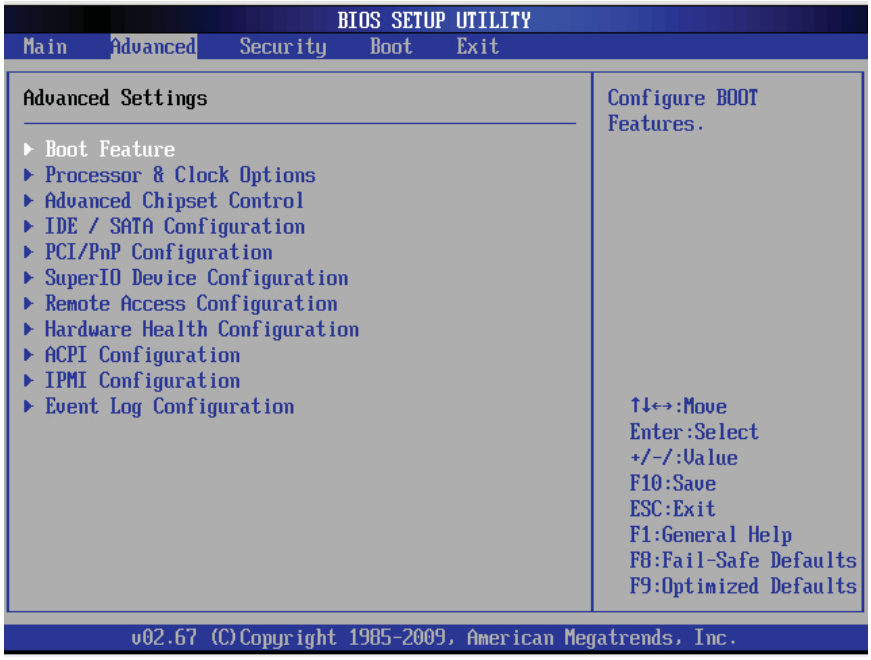
- CPU Type: This item displays the type of CPU used in the motherboard.
- Speed: This item displays the speed of the CPU detected by the BIOS.
- Physical Count: This item displays the number of processors installed in your system as detected by the BIOS.
- Logical Count: This item displays the number of CPU Cores installed in your system as detected by the BIOS.

System Memory

This displays the memory size available in the system.

7-3 Advanced Setup Configurations

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



▶Boot Features

Quick Boot

If Enabled, this feature will skip certain tests during POST (Power-On Self Test) to reduce the time needed for system boot. The options are **Enabled** and Disabled.

Quiet Boot

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

AddOn ROM Display Mode

This feature sets 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 **Force BIOS** and Keep Current.

Bootup Num-Lock

This feature allows the user to select the Power-on state for the Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

When set to Enabled, this feature forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

Hit 'Del' Message Display

Select Enable to display "Press DEL to run Setup" during POST. The options are **Enabled** and Disabled.

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 the 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 the 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 reboot when it is inactive for more than 5 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 press the power button. If this feature is set to 4_Second_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_Second_Override.

Restore on AC Power Loss

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

▶Processor and Clock Options

This submenu allows the user to configure the Processor and Clock settings.

Clock Spread Spectrum

When this feature is enabled, BIOS will monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

Hardware Prefetcher (Available when supported by the CPU)

If set to Enabled, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disabled and **Enabled**.

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

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

MPS and ACPI MADT Ordering

This feature allows you to decide how the Multiple APIC Description Table (MADT) is ordered. Select Modern Ordering for Microsoft Windows XP or later, Select Legacy Ordering for Microsoft Windows 2000 or earlier. The options are **Modern Ordering** and Legacy Ordering.

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

Select Enabled to use 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: Please power off and restart the system for any change on this setting to take effect. Please refer to Intel's web site for detailed information.

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

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.)

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

Select Enabled to use Intel Simultaneous Multi-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Active Processor Cores

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

Intel® EIST Technology

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. **Please refer to Intel's web site for detailed information.** The options are Disable (Disable GV3) and **Enable (Enable GV3)**.

Intel® TurboMode Tech.

Select Enabled to allow the processor cores to run faster than normal under special circumstances to improve performance. The options are Disable and **Enabled**.

C1E Support

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

Intel® C-State Tech

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

C-State package limit setting (Available when Intel® C-State Tech is enabled)

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

C1 Auto Demotion

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

C3 Auto Demotion

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

ACPI T State

Select Enabled to report processor throttling in ACPI. The options are **Disabled** and Enabled.

▶Advanced Chipset Control

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

▶CPU Bridge Configuration

QPI Links Speed

This feature selects QPI's data transfer speed. The options are Slow-mode and **Full Speed**.

QPI Frequency (Available when QPI Links Speed is set to 'Full Speed')

This feature selects the desired QPI frequency. The options are **Auto**, 4.800 GT, 5.866GT, 6.400 GT.

QPI L0s and L1

Select Enabled to lower the QPI power state. L0s and L1 are automatically selected by the motherboard. The options are **Disabled** and Enabled.

Memory Frequency

This feature forces a DDR3 frequency slower than what the system has detected to run at the frequency as specified. The options are **Auto**, Force DDR-800, Force DDR-1066, Force DDR-1333 and Force SPD.

Memory Mode

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

Demand Scrubbing

This is a memory error-correction scheme which the processor to write corrected data back into the memory block from where it was read by the Processor. The options are Enabled and **Disabled**.

Patrol Scrubbing

This is a memory error-correction scheme that works in the background looking for and correcting resident errors. The options are **Enabled** and Disabled.

Throttling - Closed Loop

Throttling improves reliability and reduces power use in the processor by automatic voltage control during processor idle states. The options are Disabled and **Enabled**.

▶North Bridge Configuration

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

Intel I/O AT

This feature works with Intel I/O AT (Acceleration Technology) to accelerate the performance of TOE devices. TOE devices are specialized, dedicated processors that are installed on add-on cards or network cards to handle packet processing of the add-on cards. When this feature is set to Enabled, it will enhance overall system performance by providing direct memory access for data transferring. The options are **Enabled** and Disabled.

DCA (Direct Cache Access) Technology (Available when Intel I/O AT is enabled)

This feature works in conjunction with Intel I/O AT (Acceleration Technology) to accelerate the performance of the TOE device. When this feature set to Enabled, it will enhance overall system performance by providing direct cache access for data transferring. The options are **Enabled** and Disabled.

DCA Prefetch Delay

A DCA Prefetch is used with TOE components to prefetch data to shorten execution cycles and maximize data processing efficiency. Prefetching too frequently can saturate the cache directory and delay necessary cache accesses. This feature reduces or increases the frequency the system prefetches data. The options are [8], [16], [24], **[32]**, [40], [48], [56], [64], [72], [80], [88], [96], [104], [112], [120]

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 VMM through DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are Enabled and **Disabled**.

Active State Power Management

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

IOH PCIE Max Payload Size

Some add-on cards perform faster with the coalesce feature, which limits the payload size to 128B; while others, with a payload size of 256B which inhibits the coalesce feature. Please refer to your add-on card user guide for the desired setting. The options are **256B** and 128MB.

▶South Bridge Configuration

This feature allows the user to configure Intel South Bridge settings.

USB Functions

Select Enabled for onboard USB connection support. The Options are: Disabled, and **Enabled**. (If this item is set to Enabled, USB 2.0 Controller will be enabled.)

Legacy USB Support

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

USB 2.0 Controller

Select Enabled to activate the USB 2.0 controller. The options are **Enabled** and Disabled. (**Note**: If the item - USB Functions is enabled, USB 2.0 Controller will always be enabled. When the item - USB Functions is disabled, the user has the option to enable or disable USB 2.0 Controller.)

USB 2.0 Controller Mode

This setting allows you to select the USB 2.0 Controller mode. The options are **Hi-Speed (480 Mbps)** and Full Speed (12 Mbps).

BIOS EHCI Hand-Off

Select Enabled to enable BIOS Enhanced Host Controller Interface support to provide a workaround solution for an operating system that does not support EHCI Hand-Off. When enabled, the EHCI Interface will be changed from the BIOS-controlled to the OS-controlled. The options are Disabled and **Enabled**.

Route Port 80h Cycle to

Use this item to decide where to route Port 80h Cycle to. The Options are **LPC** and PCI.

▶IDE/SATA/Floppy Configuration

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

SATA#1 Configuration

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

Configure SATA#1 as (Not available when SATA#1 Configuration is disabled)

This feature allows the user to select the drive type for SATA#1. The options are **IDE,** RAID and AHCI. (When the option-RAID is selected, the item-ICH RAID Code Base will appear. When the option-AHCI is selected, the item-ICH AHCI Codebase will be available.)

ICH RAID Code Base (Available when the option-RAID is selected.)

Select Intel to support Intel SATA RAID firmware to configure Intel' SATA RAID settings. Select Adaptec to enable Adaptec SATA RAID firmware to configure Adaptec's SATA RAID settings. The options are **Intel** and Adaptec.

ICH AHCI Codebase (Available when the option-AHCI is selected.)

Use this feature to select the AHCI Codebase for the ICH South Bridge. The options are BIOS Native Module and **Intel AHCI ROM**.

SATA#2 Configuration (Available when the option-IDE is selected)

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

IDE Detect Timeout (sec)

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

Primary IDE Master/Slave, Secondary IDE Master/Slave, Third IDE Master, and Fourth IDE Master

These settings allow the user to set the parameters of the IDE slots as specified. Press <Enter> to activate the following submenu items. Set the correct configurations accordingly.

Type

This feature allows the user to select the type of device connected to the slot. Select Auto to allow the BIOS to automatically select the device type as it is detected on the slot. Select CD/DVD to configure the slot for CD/DVD devices. Select ARMD to use this slot for removable devices. The options are Not Installed, **Auto**, CD/DVD and ARMD.

LBA/Large Mode

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

Block (Multi-Sector Transfer)

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

PIO Mode

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

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

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

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

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

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

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

DMA Mode

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

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

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

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

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

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

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

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

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

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

Select UDMA3 to allow the BIOS to use Ultra DMA mode 3. It has a data transfer rate of 44.4 MB/s.

Select UDMA4 to allow the BIOS to use Ultra DMA mode 4. It has a data transfer rate of 66.6 MB/s.

Select UDMA5 to allow the BIOS to use Ultra DMA mode 5. It has a data transfer rate of 100 MB/s.

Select UDMA6 to allow the BIOS to use Ultra DMA mode 6. It has a data transfer rate of 133 MB/s. The options are **Auto**, SWDMAn, MWDMAn, and UDMAn.

S.M.A.R.T. For Hard disk drives

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

32Bit Data Transfer

Select Enable to enable 32-bit IDE data transferring support. The options are **Enabled** and Disabled.

▶PCI/PnP Configuration

Clear NVRAM

Select Yes to clear the NVRAM (Non-volatile random-access memory) during system boot. The options are **No** and Yes.

Plug & Play OS

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

PCI Latency Timer

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

PCI IDE BusMaster

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

SR-IOV Support

Single Root I/O Virtualization is an industry-standard mechanism that enables a device to share its resources among several virtual machines. SR-IOV is capable of partitioning a PCI function into several virtual interfaces for sharing the resources of a PCI Express device under a virtual environment. The options are **Disabled** and Enabled.

PCI-E Slot 1~Slot 4 x16, PCI-E Slot 5~Slot 6 x8, PCI-E Slot 7~Slot 8x4

Use this setting to enable or disable any of the PCI slots indicated above. The options are Disabled and **Enabled.**

Onboard LAN Option ROM 1 Select

The item selects the type of onboard option ROM to load. The options are **PXE** and iSCSI.

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

Select Enabled to enable onboard LAN1/LAN2 Option ROMs support which will allow you to boot your systems using a network interface. The default option for LAN1 is **Enabled**, and for LAN2 is **Disabled**.

Boot Graphics Adapter Priority

This feature allows the user to specify which graphics controller to be used as the primary boot graphics controller. The options are **Onboard VGA**, PCI Slot 6 and Offboard VGA**.**

▶Super IO Device Configuration

Serial Port1 Address, Serial Port2 Address

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable. Select 3F8/IRQ4 to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options for Serial Port1 are Disabled, **3F8/IRQ4**, 3E8/IRQ4, 2E8/IRQ3 and 2F8/IRQ3. The options for Serial Port2 are Disabled, **2F8/IRQ3**, 3E8/IRQ4, 3F8/IRQ4, and 2E8/IRQ3.

Serial Port 2 Attribute

This feature enables COM2 to act as a virtual COM Port for Serial Over LAN (SOL). The options are COM and **SOL**.

▶Remote Access Configuration

Remote Access

Select Enabled to enable Remote Access support. The options are Disabled and **Enabled**. If Remote Access is set to Enabled, the following items will display:

Serial Port Number

This feature allows the user decide which serial port to be used for Console Redirection. The options are COM 1 and **COM2**.

Base Address, IRQ

This item displays the base address and IRQ of the serial port used for Console Redirection. This setting is configured via the item-Serial Port 1 Address/IRQ or Serial Port 2 Address/IRQ in the Super I/O submenu.

Serial Port Mode

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

Flow Control

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

Redirection After BIOS POST

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

Terminal Type

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

VT-UTF8 Combo Key Support

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

Sredir Memory Display Delay

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

▶Hardware Health Configuration

This feature allows the user to monitor system health and review the status of each item as displayed.

CPU Overheat Alarm

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

Warning!

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

2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.

The options are:

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

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

CPU 1 Temperature/CPU 2 Temperature/System Temperature (TR2)/ System Temperature (TR1)

This feature displays current temperature readings for the CPU and the System.

The following items will be displayed for your reference only:

CPU 1 Temperature/CPU 2 Temperature

The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded by unique temperature information that the motherboard can read. This 'Temperature Threshold' or 'Temperature Tolerance' has been assigned at the factory and is the baseline on which the motherboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different 'Temperature Tolerances', the installed CPU can now send information to the motherboard what its 'Temperature Tolerance' is, and not the other way around. This results in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading. The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

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

Medium – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'.

The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

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

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

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

Notes: The system may shut down if it continues for a long period to prevent damage to the CPU. The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at www.Intel.com.

System Temperature (TR2)/System Temperature (TR1)

The temperature for each sensor indicated will be displayed (in degrees in Celsius and Fahrenheit) as detected by the BIOS.

Fan1 ~ Fan 10 Reading

This feature displays the fan speed readings from Fan1 through Fan10. (Fan1 is CPU1 Fan and Fan2 is CPU2 Fan.)

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select "Full Speed/FS" to allow the onboard fans to run at full speed for maximum cooling. The FS setting is recommended for special system configuration or debugging. Select "Performance/PF" for better system cooling. The PF setting is recommended for high-power-consuming and high-density systems. Select "Balanced/BL" for the onboard fans to run at a speed that will balance the needs between system cooling and power saving. The BL setting is recommended for regular systems with normal hardware configurations. Select "Energy Saving/ES" for best power efficiency and maximum quietness. The Options are: Full Speed/FS, Performance/PF, **Balanced/BL**, and Energy Saving/ES.

Voltage Monitoring

CPU1 Vcore, CPU2 Vcore, ICH 1.5V, 5V, 12V, 5Vsb, CPU1 DDR3, CPU2 DDR3, 3.3V, 3.3Vsb, Vbat, IOH 1.1V

▶ACPI Configuration

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

High Precision Event Timer

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

USB Device Wake-Up

Select Enabled for the system to wake up from the standby mode by a Universal Serial Bus (USB) device (such as, a USB mouse or USB keyboard). The options are Enabled and **Disabled**.

ACPI Aware O/S

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

ACPI APIC Support (Available ACPI Aware O/S='Yes')

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

APIC ACPI SCI IRQ

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

Headless Mode (Available ACPI Aware O/S='Yes')

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

ACPI Version Features (Available ACPI Aware O/S='Yes')

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

NUMA Support

If this feature is enabled, Non-Uniform Memory Access will enhance CPU performance. The options are **Enabled,** Disabled and NUMA for SLES11 (SUSE Linux Enterprise Server 11).

WHEA Support

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

▶Trusted Computing (Optional)

TCG/TPM Support

Select Yes to support trusted platforms (TPM 1.1/1.2) which will allow the BIOS to automatically download the drivers needed to provide support for the platforms specified. The options are Yes and **No**.

Indicate Physical

Select Yes for the BIOS to indicate the physical presence of a component to the TPM device at system boot. The options are **No** and Yes.

TPM Deactivated/Activated

This feature activates or disables the TPM device. The options are **Don't Change**, Set and Clear.

TPM Owner

This feature installs or clears TPM ownership. The options are **Don't Change**, Enable Install, Disable Install and Clear.

Execute TPM Command

Select Enabled to send an executable command to a TPM device. The options are **Don't Change**, Enabled and Disabled.

Clear the TPM

Press <Enter> to clear the TPM memory. This will erase all information related to TPM support.

If TCG/TPM Support is set to Yes, TPM Status will display:

TPM Enable/Disable Status

TPM Owner Status

▶IPMI Configuration

Intelligent Platform Management Interface (IPMI) is a set of common interfaces that are used for hardware health monitoring and system management. For more information on the IPMI specifications, please visit Intel's web site at www.intel.com.

IPMI Firmware Revision

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

Status of BMC

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

▶View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events.

To view an event, select an Entry Number and press <Enter> to display the information as shown in the screen.

- SEL Entry Number
- SEL Record ID
- SEL Record Type
- Event Timestamp
- Generator ID
- Event Message Format Ver
- Event Sensor Type
- Event Sensor Number,
- Event Dir Type
- Event Data.

Clear BMC System Event Log

Clear BMC System Log

Select OK and press <Enter> to clear the BMC system log. Select Cancel to keep the BMC System log. The options are **OK** and Cancel.

Caution: Any cleared information is unrecoverable. Make absolutely sure that you no longer need any data stored in the log before clearing the BMC Event Log.

▶Set LAN Configuration

Use this feature to configure the IPMI LAN adapter with a network address as shown in the following graphics.

Channel Number - This feature displays the channel number.

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

IP Address Source

This feature allows the user to select the source of the IP address for the system. If Static is selected, the user will need to manually enter the IP address for the system. If DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that the system is attached to, and request the next available IP address. The options are **DHCP** and Static. If Static is selected, the following items will be available for configuration.

IP Address

BIOS will automatically enter the IP address of the machine you are using; however the IP address may be overwritten. The IP address should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255.

Subnet Mask

This item displays the current subnet mask setting for your IPMI connection. The value of each three-digit number separated by dots should not exceed 255.

Gateway Address

BIOS will automatically enter the Gateway address of this machine; however it may be overwritten. Gateway addresses are 4-decimal numbers in dotted quad form (i.e., 192.168.10.253). The value of each 3-digit number separated by dots should not exceed 255.

Mac Address

The BIOS will automatically enter the Mac address of this machine; however it may be overwritten. Mac addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

▶Event Log Configuration

View Event Log

Use this option to view the System Event Log.

Mark all events as read

Select OK to mark all events as read. The options are **OK** and Cancel.

Clear event log

Select OK to clear all messages in the event log. The options are **OK** and Cancel.

PCIE Error Log

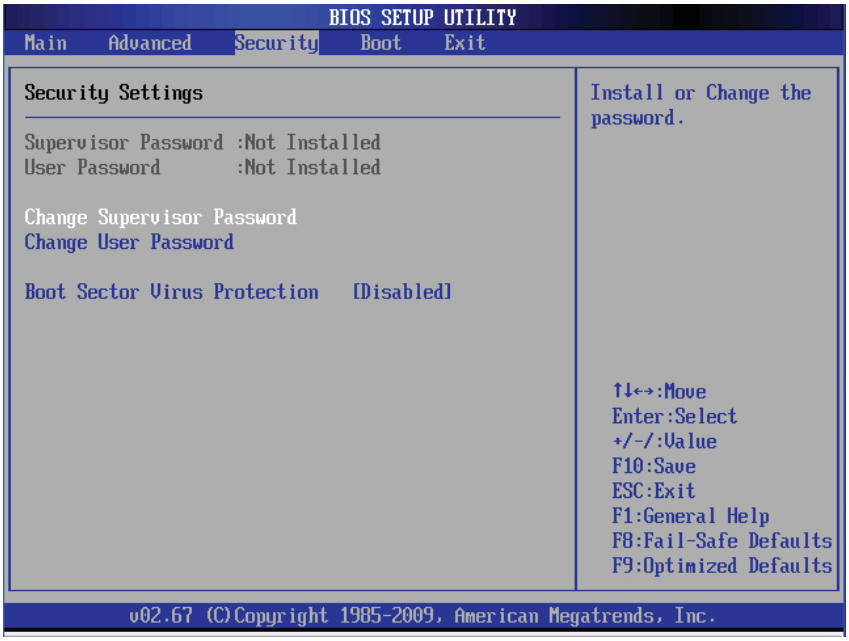
Select Yes to log PCI-E Errors. The options are Yes and **No**.

Memory ECC Error Log

Select Yes to enable ECC memory error logging . The options are **Yes** and No.

7-4 Security Settings

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



Supervisor Password

This item indicates if a supervisor password has been entered for the system. "Not Installed" means a supervisor password has not been used.

User Password

This item indicates if a user password has been entered for the system. "Not Installed" means that a user password has not been used.

Change Supervisor Password

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

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

Use this feature to set the user's access level. Select **Full Access** to grant the user full read and write access to the BIOS Setup Utility. Select View Only to allow the user to view the Setup Utility displays without making any changes. Select Limited to allow the user to make changes on limited items such as Date and Time, Select No Access to prevent the user from entering the Setup Utility.

Change User Password

Select this feature and press <Enter> to enter a new User Password.

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

This item allows you to clear a user password after it has been entered.

Password Check

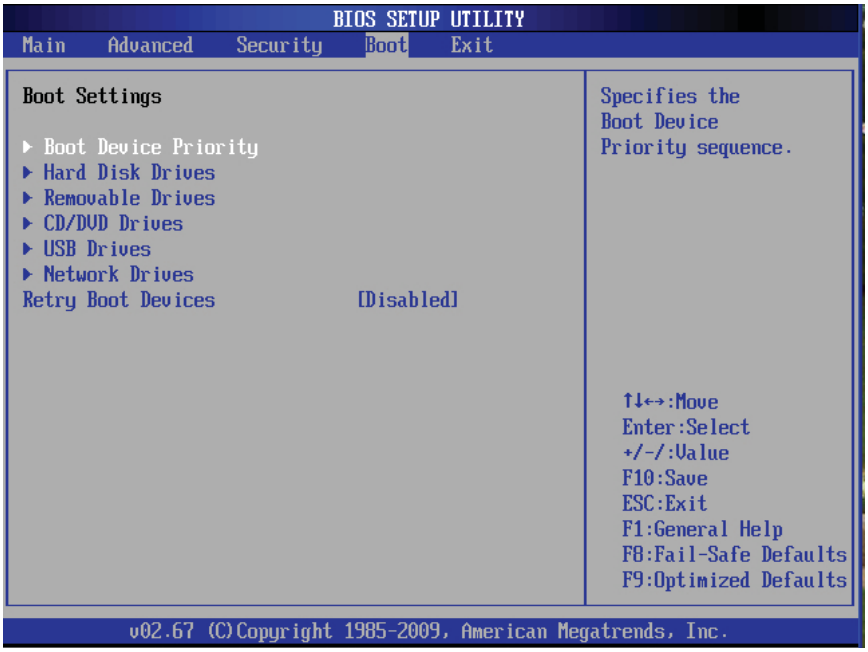
Select Setup for the system to check for a password when entering the BIOS Setup utility. Select Always for the system to check for a password at bootup. The options are **Setup** and Always.

Boot Sector Virus Protection

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

7-5 Boot Configuration

Use this feature to configure boot priority settings.



▶Boot Device Priority

Use this feature to specify the sequence of boot priority for onboard devices. The settings are 1st boot device~5th boot device and Disabled.

- 1st Boot Device/2nd Boot Device/3rd Boot Device

▶Hard Disk Drives

Use this feature to specify the boot sequence from all bootable HDD devices. The settings are Disabled and a list of all hard disk drives that have been detected.

- 1st Boot Device/2nd Boot Device/3rd Boot Device

▶Removable Drives

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

- 1st Boot Device/2nd Boot Device/3rd Boot Device

▶CD/DVD Drives

This feature allows the user to specify the boot sequence from available CD/DVD Drives (i.e., 1st Drive, 2nd Drive, etc).

- 1st Boot Device/2nd Boot Device/3rd Boot Device

▶USB Drives

Use this feature to specify the boot sequence from available USB drives. The settings are 1st boot device, 2nd boot device, and Disabled.

- 1st Boot Device/2nd Boot Device/3rd Boot Device

▶Network Drives

Use this feature to specify the boot sequence from available network drives. The settings are 1st boot device, 2nd boot device, and Disabled.

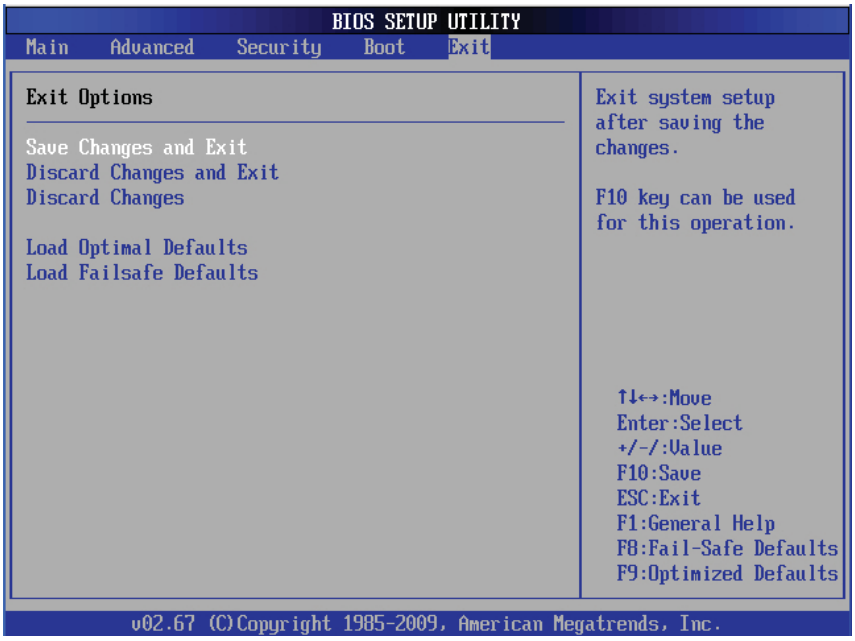
- 1st Boot Device/2nd Boot Device

Retry Boot Devices

Select Enabled to enable Retry Boot Devices support to allow the system to attempt to boot from a specific boot device after a boot failure. The options are Enabled and **Disabled**.

7-6 Exit Options

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



Save Changes and Exit

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

Discard Changes and Exit

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

Discard Changes

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

Load Optimal Defaults

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

Load Fail-Safe Defaults

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

Notes

Appendix A

BIOS POST Error Codes

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

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

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

BIOS POST Error Codes

Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
1 long beep + 8 short beeps	Display memory read/write error or no video	No video display, video adapter missing or with faulty memory
Continuous high (pitch) + low (pitch)	System Overheat	System overheat

Notes

Appendix B

System Specifications

Processors
Two Intel Xeon 5600/5500 series processors

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

Chipset
Dual Intel 5520 + ICH10R

BIOS
32 Mb AMIBIOS® SPI Flash ROM

Memory Capacity
Six DIMM sockets supporting up to 96 GB of registered ECC or up to 24 GB of unbuffered ECC/non-ECC DDR3-1333/1066/800 SDRAM

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

GPUs (Graphics Processing Units)
Supports up to three GPU cards

SATA Controller
Intel on-chip controller for 3 Gb/s SATA (RAID 0, 1, 10 and 5 support)

Drive Bays
Four 2.5" hot-swap drive bays to house SATA drives

Expansion Slots
Four PCI-E 2.0 cards with the use of riser cards

Serverboard
X8DTG-QF+ (proprietary ATX form factor)
Dimensions: 19.7" x 9.2" (500.4 x 233.7 mm)

Chassis
SC118GQ-R1800B (1U rackmount)
Dimensions: (WxHxD) 17.2 x 1.7 x 30.6 in. (437 x 43 x 777 mm)

System Cooling

Ten sets of 4-cm counter-rotating cooling fans (fan speed controlled by BIOS setting)

System Input Requirements

AC Input Voltage: 180-240 VAC
Rated Input Current: 1000W: 100-120V/12-10A, 1200W: 120-140V/12-10A, 1800W: 200-240V/10-8.5A
Rated Input Frequency: 50-60 Hz

Power Supply

Rated Output Power: 1800W (Part# PWS-1K81P-1R)
Rated Output Voltages: +12V (150A), +5Vsb (4A)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)
Non-Operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-Operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions: FCC Class 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”

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Notes