Chapter 1

Introduction

1-1   Overview

The A+ Server 2021TM-BTRF/BIBXRF is a high-end server comprised of two main subsystems: the SC827 2U server chassis and the H8DMT-F/H8DMT-IBXF dual processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the 2021TM-BTRF/BIBXRF, as listed below:

- Eight passive CPU heatsinks (SNK-P0022+)

- Four 8-cm chassis fans (FAN-0111L4)

- Four air shrouds (MCP-310-82703-0B)

- Four riser cards (RSC-R1U-E16R-O-P)

- SATA Accessories
  One SATA backplane (BPN-SAS-827B)
  Four 16-pin to 16-pin front control cable (CBL-0151L)
  Four sets of SATA cables (CBL-0317L)
  Four 4-pin fan cables (CBL-0320L)
  Four 4-pin to 4-pin I2C cables (CBL-0323L)
  Twelve 3.5" hot-swappable drive carriers (MCP-220-00024-0B)

- One rackmount kit (MCP-290-00053-0N)

- One CD containing manual, drivers and utilities

1-2   Serverboard Features

At the heart of the A+ Server 2021TM-BTRF/BIBXRF lies the H8DMT-F/H8DMT-IBXF, a dual processor serverboard based on the nVidia MCP55 Pro Chipset and designed to provide maximum performance. Up to four of these serverboards can be mounted in the SC827 chassis. The 2021TM-BTRF server contains the H8DMT-F serverboard, while the 2021TM-BIBXRF contains the H8DMT-IBXF serverboard.

The difference between the H8DMT-F and H8DMT-IBXF serverboards are the availability of InfiniBand components. Refer to the table below for details.

Serverboard	Full IPMI Capability	InfiniBand Components
H8DMT-F	X	
H8DMT-IBXF	X	X

The sections below cover the main features of the H8DMT-F/H8DMT-IBXF serverboards (see Figure 1-1 for a block diagram of the chipset).

Processors

The H8DMT-F/H8DMT-IBXF supports single or dual AMD Opteron 2000 series processors (Socket F type). Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The H8DMT-F/H8DMT-IBXF has eight 240-pin DIMM slots that can support up to 64 GB of DDR2-800/667/533 registered ECC SDRAM. The memory operates in an interleaved configuration and requires modules of the same size and speed to be installed two at a time. See Chapter 5 for details.

Serial ATA

A Serial ATA controller is integrated into the nVidia MCP55 Pro Chipset to provide a four-port 3 Gb/s SATA subsystem, which is RAID 0, 1, 5 and JBOD 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 H8DMT-F/H8DMT-IBXF has one PCI Express x16 expansion slot.

Onboard Controllers/Ports

One Fast UART 16550 compatible serial port and a Mellanox Connect-X MT25408 20Gb/s InfiniBand controller are located on the serverboard. 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 (additional 2+2 internal USB headers are included on the serverboard) and two gigabit Ethernet ports.

Graphics Controller

The H8DMT-F/H8DMT-IBXF features an integrated Windbond WPCM450 BMC graphics controller.

Other Features

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

1-3   Server Chassis Features

The following is a general outline of the main features of the SC827 server chassis.

System Power

Each SC827 chassis model includes a high-efficiency 80 Plus Gold certified power supply, rated at 1200 Watts plus one redundant backup power supply. In the unlikely event your power supply fails, replacement is simple and can be accomplished without tools.

SATA Subsystem

The SC827 supports up to twelve 3.5" hot-swap SATA drives in trays (3 for each node). These drives are hot-swappable units and are connected to a backplane that provides power and control.

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

Front Control Panel

SC827 models include four front panels on the handles of the chassis which control each of the systems. Each control panel on the A+ Server 2021TM-BTRF/BIBXRF provides you with system monitoring and control for one server node. LEDs indicate system power, HDD activity, network activity, system overheat and power supply failure. A main power button and a system reset button are also included.

I/O Backplane

The SC827 is an ATX form factor chassis designed to be used in a 2U rackmount configuration. The SAS827B I/O backplane provides a low-profile add-on card slot, a COM port, a VGA port, two USB 2.0 ports and two gigabit Ethernet ports per node.

For more information regarding the backplane, view the appendices found at the end of this manual.

Cooling System

The SC827 chassis accepts four system fans powered from either backpane or the serverboards. If not powered from the backpane, the SC827B model chassis powers two fans from two motherboards, so that when one of the motherboard drawers is removed, the second motherboard will continue running both fans.

Air Shrouds

The SC827 chassis includes four mylar air shrouds that direct the airflow where cooling is needed on each serverboard. Always use the air shroud included with your chassis on each serverboard.
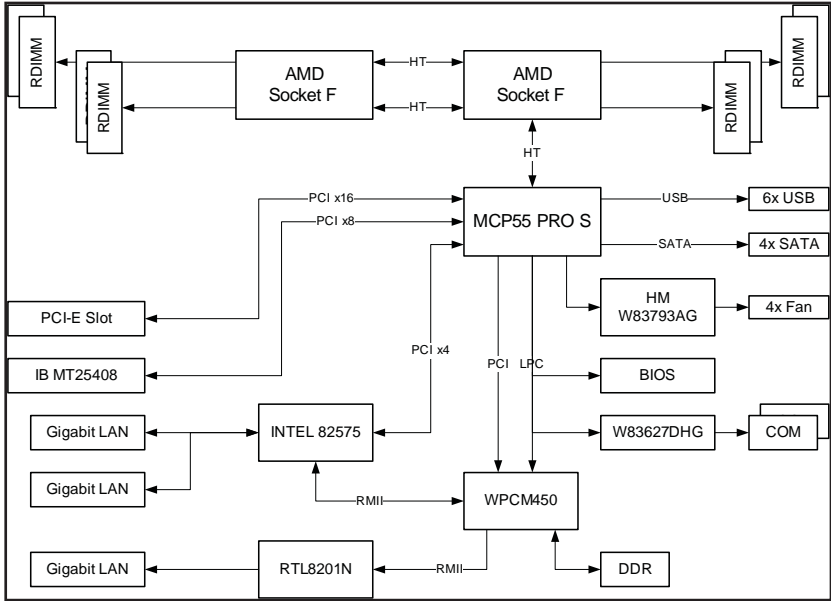
Mounting Rails

The SC827 includes a set of quick-release rails, and can be placed in a rack for secure storage and use. To setup your rack, follow the step-by-step instructions included in this manual.

Figure 1-1. nVidia MCP55 Pro Chipset:
System Block Diagram

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

1-4   Contacting Supermicro

Headquarters

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

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	Het Sterrenbeeld 28, 5215 ML
	's-Hertogenbosch, The Netherlands
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Fax:	+31 (0) 73-6416525
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	support@supermicro.nl (Technical Support)
	rma@supermicro.nl (Customer Support)

Asia-Pacific

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	4F, No. 232-1, Liancheng Rd.
	Chung-Ho 235, Taipei County
	Taiwan, R.O.C.
Tel:	+886-(2) 8226-3990
Fax:	+886-(2) 8226-3991
Web Site:	www.supermicro.com.tw
Technical Support:	
Email:	support@supermicro.com.tw
Tel:	886-2-8228-1366, ext.132 or 139

1-5   2U Twin^2: System Notes

As a 2U Twin^2 configuration, the 2021TM-BTRF/BIBXRF is a unique server system. With four system boards incorporated into a single chassis acting as four separate nodes, there are several points you should keep in mind.

Nodes

Each of the four serverboards act as a separate node in the system. As independant nodes, each may be powered off and on without affecting the others. In addition, each node is a hot-swappable unit that may be removed from the rear of the chassis. The nodes are connected to the server backplane by means of an adapter card.

Note: a guide pin is located between the upper and lower nodes on the inner chassis wall. This guide pin also acts as a "stop" when a node is fully installed. If too much force is used when inserting a node this pin may break off. Take care to slowly slide a node in until you hear the "click" of the locking tab seating itself.

System Power

A single 1200W power supply is used to provide the power for all four serverboards. Each serverboard however, can be shut down independently of the other with the power button on its own control panel. As an option, you may add an additional 1200W power supply module for power redundancy.

SATA Backplane/Drives

As a system, the 2021TM-BTRF/BIBXRF supports the use of twelve SATA drives. A single SATA backplane works to apply system-based control for power and fan speed functions, yet at the same time logically connects a set of three SATA drives to each serverboard. Consequently, RAID setup is limited to a three-drive scheme (RAID cannot be spread across all twelve drives). See the Drive Bay Installation/Removal section in Chapter 6 for the logical hard drive and node configuration.

Notes

Chapter 2

Server Installation

2-1   Overview

This chapter provides a quick setup checklist to get your A+ Server 2021TM-BTRF/BIBXRF 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 A+ Server 2021TM-BTRF/BIBXRF 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 A+ Server 2021TM-BTRF/BIBXRF. 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 A+ Server 2021TM-BTRF/BIBXRF was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

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

⚠ Warnings and Precautions! ⚠

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.

- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.

- Always make sure the rack is stable before extending a component from the rack.

- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.

- Determine the placement of each component in the rack *before* you install the rails.

- Install the heaviest server components on the bottom of the rack first, and then work up.

- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.

- Allow any hot plug drives and power supply modules to cool before touching them.

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

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (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 SC827 chassis into a rack unit with the quick-release rails provided. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

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

Separating the Sections of the Rack Rails

The chassis package includes two rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.
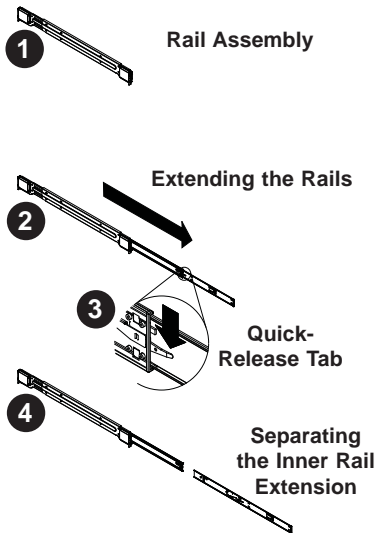
Rail Assembly

Separating the Inner and Outer Rails

1. Locate the rail assembly in the chassis packaging.

Extending the Rails

2. Extend the rail assembly by pulling it outward.

3. Press the quick-release tab.

Quick-Release Tab

4. Separate the inner rail extension from the outer rail assembly.

Separating the Inner Rail Extension
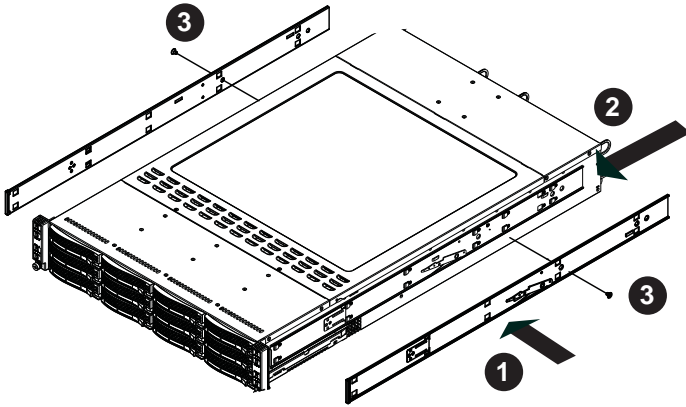
Figure 2-1: Separating the Rack Rails

Figure 2-2: Installing the Inner Rail Extensions

Installing the Inner Rail Extension

The SC827 chassis includes a set of inner rails in two sections: inner rails and inner rail extensions. The inner rails are pre-attached to the chassis, and do not interfere with normal use of the chassis if you decide not to use a server rack. The inner rail extension is attached to the inner rail to mount the chassis in the rack.

Installing the Inner Rails

1. Place the inner rail extensions on the side of the chassis aligning the hooks of the chassis with the rail extension holes. Make sure the extension faces "outward" just like the pre-attached inner rail.

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

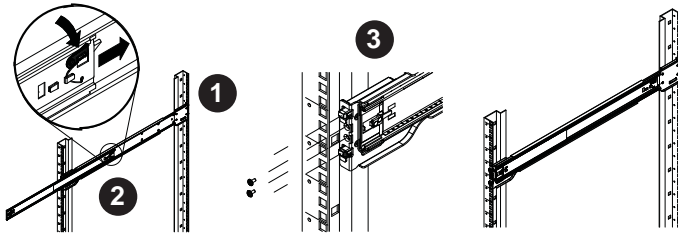3. Secure the chassis with 2 screws as illustrated. Repeat steps for the other inner rail extension.
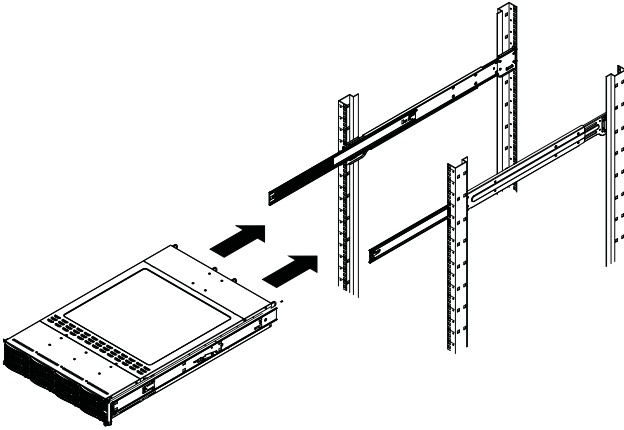
Figure 2-3. Assembling the Outer Rails

Outer Rack Rails

Outer rails attach to the rack and hold the chassis in place. The outer rails for the SC827 chassis extend between 30 inches and 33 inches.

Installing the Outer Rails to the Rack

1. Secure the back end of the outer rail to the rack, using the screws provided.

2. Press the button where the two outer rails are joined to retract the smaller outer rail.

3. Hang the hooks of the rails onto the rack holes and if desired, use screws to secure the front of the outer rail onto the rack.

4. Repeat steps 1-3 for the remaining outer rail.

Figure 2-4: Installing the Rack Rails

Installing the Chassis into a Rack

1. Extend the outer rails as illustrated above.

2. Align the inner rails of the chassis with the outer rails on the rack.

3. Slide the inner rails into the outer rails, keeping the pressure even on both sides. When the chassis has been pushed completely into the rack, it should click into the locked position.

4. Optional screws may be used to secure the to hold the front of the chassis to the rack.

2-5   Checking the Serverboard Setup

After you install the 2021TM-BTRF/BIBXRF in the rack, you will need to open the unit to make sure the serverboard is properly installed and all the connections have been made.

Accessing the inside of the System

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

Removing the Chassis Cover and Protective Film

1. Remove the two screws which secure the top cover onto the chassis as shown above.

2. Lift the top cover up and off the chassis.

3. Peel off the protective film covering the top cover and the top of the chassis

4. Check that all ventilation openings on the top cover and the top of the chassis are clear and unobstructed.

Checking the Components and Setup

1. You may have one or two processors already installed into the serverboard. Each processor needs its own heat sink. See Chapter 5 for instructions on processor and heat sink installation.

2. Your 2021TM-BTRF/BIBXRF server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

3. If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.

4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. Also make sure that no cables are positioned in front of the fans. See Chapter 5 for details on cable connections.

Figure 2-5. Accessing the Inside of the System

1

**Remove two
screws**

2

3

**Check Ventilation
Openings**

4
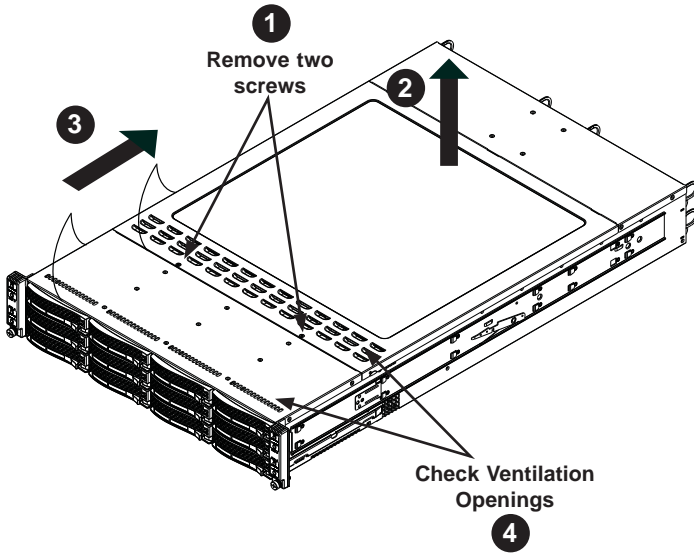
2-6   Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the SATA drives have been properly installed and all connections have been made.

Checking the Drives

1. All drives are accessible from the front of the server. For servicing the DVD-ROM and floppy drives, you will need to remove the top chassis cover. The hard drives can be installed and removed from the front of the chassis without removing the top chassis cover.

2. Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install hard drives, please refer to Chapter 6.

Checking the Airflow

1. Airflow is provided by four hot-swappable 8-cm chassis cooling fans. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

Providing Power

1. Plug the power cord(s) from the power supply unit(s) into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

2. Depress the power on button on the front of the chassis.

Chapter 3

System Interface

3-1   Overview

There are several LEDs on the control panel and on the drive carriers to keep you constantly informed of the overall status of the system. SC827 models include four front panels on the handles of the chassis which control each of the systems.

This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.
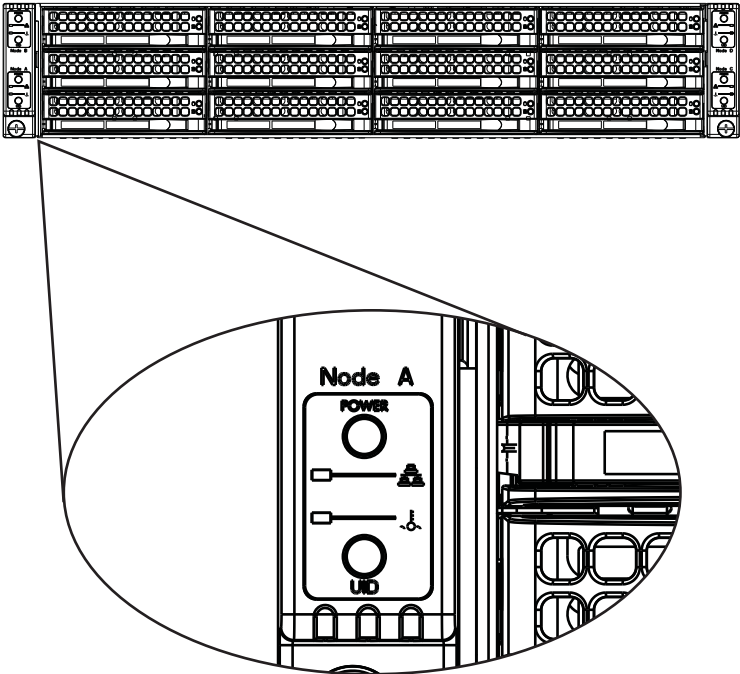
4-2   Control Panel Button

POWER

- Power: The main power button on each of the four control panels is used to apply or remove power from the power supply to each of the four systems in the chassis. Turning off system power with this button removes the main power, but keeps standby power supplied to the system. Therefore, you must unplug system before servicing.

4-3   Control Panel LEDs

The four control panels are located on the front handle of the SC827 chassis. Each control panel has three LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

- Overheat: This LED is illuminated when an overheat condition occurs. A solid red LED indicates an overheat condition in the system. A flashing red LED which flashes in one second intervals indicates a fan failure. A flashing red LED which flashes in four second interfals indicates a power failure. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers and air shrouds are installed. Finally, verify that the heatsinks are installed properly. This LED will remain flashing or on as long as the temperature is too high or a fan does not function properly.
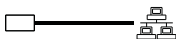
- NIC1: Indicates network activity on GLAN1 when flashing.

4-4   Drive Carrier LEDs

The server chassis uses SATA drives.

SATA Drives

Each SATA drive carrier has two LEDs.

*   Green: Each Serial ATA drive carrier has a green LED. When illuminated, this green LED (on the front of the SATA drive carrier) indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.

*   Red: The red LED to indicate an SATA drive failure. If one of the SATA drives fail, you should be notified by your system management software.

SCSI Drives

This chassis does not support SCSI drives at this time.

Notes

Chapter 4

System Safety

4-1   Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the A+ SERVER 202ITM-BTRF/BIBXRF 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 operating system first and then unplug the power cords. The unit has more than one power supply cord. Disconnect two power supply cords before servicing to avoid electrical shock.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they 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 CR2032 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. 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 202ITM-BTRF/BIBXRF clean and free of clutter.

- The 202ITM-BTRF/BIBXRF weighs approximately 65 lbs (29.5 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 202ITM-BTRF/BIBXRF is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard CR2032 Battery

LITHIUM BATTERY

BATTERY HOLDER
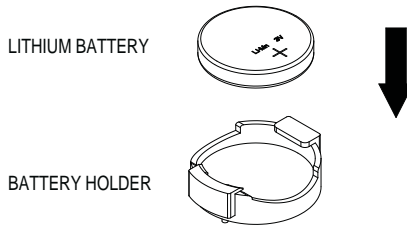
Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install the H8DMT-F/H8DMT-IBXF 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.

Note: The H8DMT-F serverboard shares the same layout as the H8DMT-IBXF serverboard, but does not include InfiniBand components. Both serverboards have full IPMI capability and a dedicated LAN port above the two USB ports for this capability.

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 H8DMT-F/H8DMT-IBXF into the SC827B-R1200B 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. The H8DMT-F/H8DMT-IBXF requires a chassis big enough to support a 16.4" x 6.5" serverboard, such as Supermicro's SC827B-R1200B.

3. 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.

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

5. 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.

6. Finish by replacing the top cover of the chassis.

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

5-3   Connecting Cables

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

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-4 for connector locations.)

- SATA drive data cables

- Control Panel cable (JF1)

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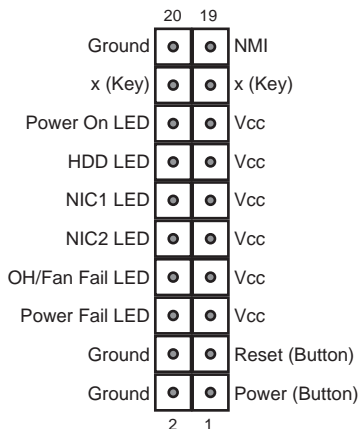
Connecting Power Cables

The H8DMT-F/H8DMT-IBXF has two 20-pin primary power supply connectors (JPW1 and JPW2) for connection to the ATX power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

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

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

Figure 5-1. Control Panel Header Pins

	20	19	
Ground	●	●	NMI
x (Key)	●	●	x (Key)
Power On LED	●	●	Vcc
HDD LED	●	●	Vcc
NIC1 LED	●	●	Vcc
NIC2 LED	●	●	Vcc
OH/Fan Fail LED	●	●	Vcc
Power Fail LED	●	●	Vcc
Ground	●	●	Reset (Button)
Ground	●	●	Power (Button)
	2	1	

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

IPMI LAN

| USB0/1 | LAN1 | LAN2 | COM1 Port (Turquoise) | VGA Port (Blue) | InfiniBand Port |
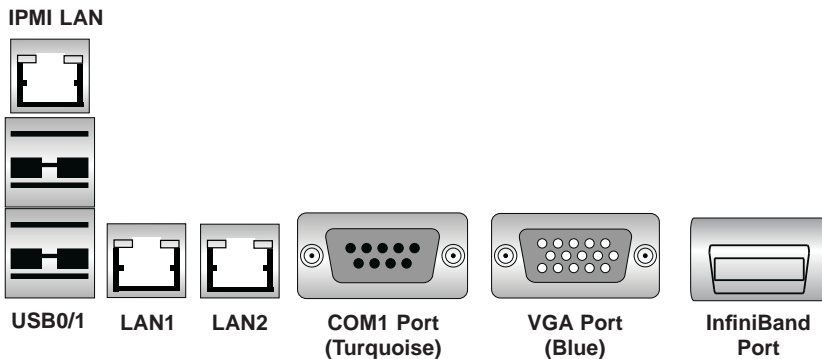
5-5   Installing the Processor and Heatsink

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

Notes:

1. 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.

2. AMD's boxed processor package contains the CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use an AMD-certified multi-directional heatsink and fan only.

3. Make sure to install the serverboard into the chassis before you install the CPU heatsink and heatsink fan.

4. When purchasing an AMD Opteron 2000 series processor or when receiving a serverboard without an Opteron 2000 processor pre-installed, make sure that the plastic CPU cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.

5. Refer to the Supermicro web site for updates on CPU support.

Installing an Opteron 2000 Processor

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.

1. Begin by removing the cover plate that protects the CPU. Lift the lever on the CPU socket until it points straight up. With the lever raised, lift open the silver CPU retention plate.

2. Use your thumb and your index finger to hold the CPU. Locate and align pin 1 of the CPU socket with pin 1 of the CPU. Both are marked with a triangle. Align pin 1 of the CPU with pin 1 of the socket.

3. Once aligned, carefully place the CPU into the socket. Do not drop the CPU on the socket, move the CPU horizontally or vertically or rub the CPU against the socket or against any pins of the socket, which may damage the CPU and/ or the socket.

4. With the CPU inserted into the socket, inspect the four corners of the CPU to make sure that it is properly installed and flush with the socket. Then, gently lower the silver CPU retention plate into place.

5. Carefully press the CPU socket lever down until it locks into its retention tab. For a dual-CPU system, repeat these steps to install another CPU into the CPU#2 socket (and into CPU#2, #3 and #4 sockets for a quad-CPU configuration).

Note: In single and dual-CPU configurations, memory must be installed in the DIMM slots associated with the installed CPU(s). Memory is limited to a maximum of 32 for single CPU and 64 GB for dual CPU configurations.

Installing a Passive Heatsink

Installing the Heatsink Retention Modules

Two heatsink retention modules (BKT-0012L) and four screws are included in the retail box. Once installed, these are used to help attach the heatsinks to the CPUs. To install, align the module with the standoffs of the preinstalled CPU backplate and with the four feet on the module contacting the serverboard. Secure the retention module to the backplate with two of the screws provided. See Figure 2-1. Repeat for the second CPU socket.

Note: BKT-0012L is included for use with non-Supermicro heatsinks only. When installing Supermicro heatsinks, only BKT-0011L (the pre-installed CPU backplate) is needed. The BKT-0012L retention module was designed to provide compatibility with clip-and-cam type heatsinks from third parties.

Figure 2-1. CPU Heatsink Retention Module Installation
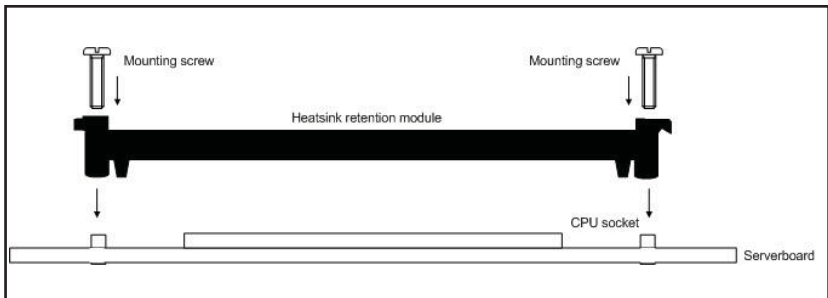
Installing the Heatsink

The use of active type heatsinks (except for 1U systems) are recommended. Connect the heatsink fans to the appropriate fan headers on the serverboard. To install the heatsinks, please follow the installation instructions included with your heatsink package (not included).

Removing the Heatsink

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

Removing a Passive Heatsink

1. Unplug the power cord from the power supply.

2. Disconnect the heatsink fan wires from the CPU fan header.

3. Use your fingertips to gently press on the fastener cap. Then turn it counterclockwise for a 1/4 (90^0) turn and then pull the fastener upward to loosen it.

4. Repeat Step 3 to loosen all fasteners from the mounting holes.

5. With all fasteners loosened, remove the heatsink from the CPU.

5-6 Installing Memory

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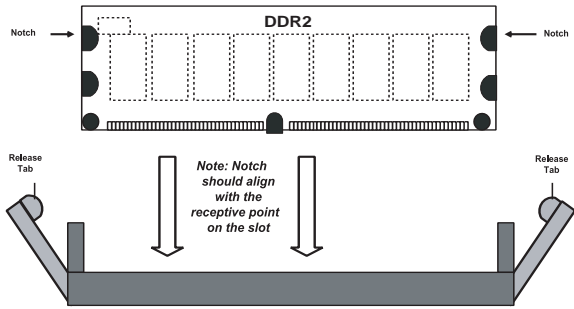
Memory Support

The H8DMT-F/H8DMT-IBXF supports up to 64 GB of DDR2-800/667/533 registered ECC SDRAM. Two-way interleaved memory is supported. (Populating DIMM1A and DIMM1B and/or DIMM2A and DIMM2B with memory modules of the same size and type will result in two-way interleaved memory, which is faster than single channel, non-interleaved memory.) Note that when ECC memory is used, it may take 25-40 seconds for the VGA to display.)

Installing Memory Modules

1. Insert each DDR2 memory module vertically into its slot, starting with DIMM #1A. Pay attention to the notch along the bottom of the module to prevent inserting the module incorrectly.

2. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules. (See support information below.)

3. To enhance memory performance, install pairs of memory modules of the same type and of the same bank (DIMM1A and DIMM1B) and then the next bank (DIMM2A and DIMM2B).
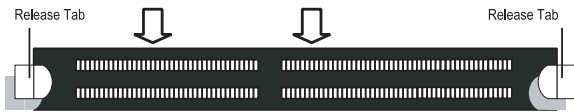
Figure 5-3. DIMM Installation

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

To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

Memory Support

The H8DMT-F/H8DMT-IBXF supports up to 64 GB of single or dual-channel DDR2-800/667/533 registered ECC SDRAM in 8 DIMM slots. DIMM sizes of 8 GB, 4 GB, 2 GB and 1 GB are supported.

DIMM Module Population Configuration

Follow the table below when installing memory.

Notes: Due to OS limitations, some operating systems may not show more than 4 GB of memory.

Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. (See the Table below.)

# DIMMs	Memory Population for Optimal Performance (For Interleaved 128-bit Operation)							
	CPU1 Branch0		CPU1 Branch1		CPU2 Branch0		CPU Branch1	
2 DIMMs	DIMM1A	DIMM1B						
			DIMM2A	DIMM2B				
4 DIMMs	DIMM1A	DIMM1B			DIMM1A	DIMM1B		
	DIMM1A	DIMM1B					DIMM2A	DIMM2B
	DIMM1A	DIMM1B	DIMM2A	DIMM2B				
			DIMM2A	DIMM2B	DIMM1A	DIMM1B		
			DIMM2A	DIMM2B			DIMM2A	DIMM2B
6 DIMMs	DIMM1A	DIMM1B			DIMM1A	DIMM1B	DIMM2A	DIMM2B
	DIMM1A	DIMM1B	DIMM2A	DIMM2B	DIMM1A	DIMM1B		
	DIMM1A	DIMM1B	DIMM2A	DIMM2B			DIMM2A	DIMM2B
			DIMM2A	DIMM2B	DIMM1A	DIMM1B	DIMM2A	DIMM2B
8 DIMMs	DIMM1A	DIMM1B	DIMM2A	DIMM2B	DIMM1A	DIMM1B	DIMM2A	DIMM2B

# DIMMs	Memory Population for Optimal Performance (For Non-Interleaved 64-bit Operation)							
	CPU1 Branch0		CPU1 Branch1		CPU2 Branch0		CPU Branch1	
1 DIMM	DIMM1A							
			DIMM2A					
2 DIMMs	DIMM1A		DIMM2A					
	DIMM1A				DIMM1A			
	DIMM1A						DIMM2A	
			DIMM2A		DIMM1A			
			DIMM2A				DIMM2A	

Note: If adding at least 4 DIMMs (with two CPU's installed), the configurations with DIMMs spread over both CPUs result in optimized performance.

Note: The first two DIMMs **must** be installed in the CPU1 memory slots.

| Possible System Memory Allocation & Availability		
System Device	Size	Physical Memory Remaining (-Available) (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99 GB
Local APIC	4 KB	3.99 GB
Area Reserved for the chipset	2 MB	3.99 GB
I/O APIC (4 Kbytes)	4 KB	3.99 GB
PCI Enumeration Area 1	256 MB	3.76 GB
PCI Express (256 MB)	256 MB	3.51 GB
PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary-	512 MB	3.01 GB
VGA Memory	16 MB	2.85 GB
TSEG	1 MB	2.84 GB
Memory available for the OS & other applications		2.84 GB

5-7   Adding PCI Add-On Cards

The 2021TM-BTRF/BIBXRF can accommodate four low-profile, full-length PCI add-on cards.

Installing an Add-on Card

1. Begin by removing the shield for the PCI slot you wish to populate.

2. Fully seat the card into the slot, pushing down with your thumbs evenly on both sides of the card.

3. Finish by using a latch to secure the top of the card shield to the chassis. The PCI slot shields protect the serverboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused slot.

5-8   Serverboard Details

Figure 5-4. H8DMT-F/H8DMT-IBXF Layout
(not drawn to scale)
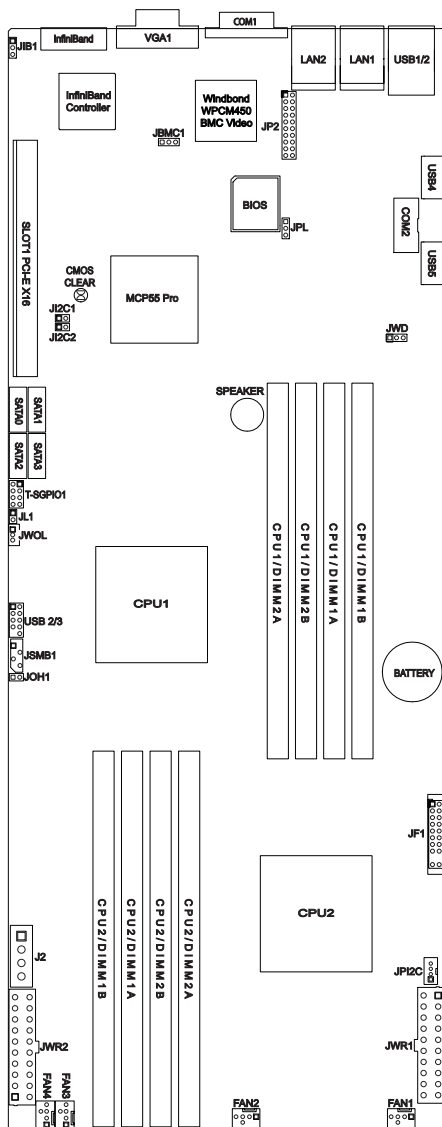
Note: jumpers not indicated are for test purposes only and should not have their settings changed.

H8DMT-F/H8DMT-IBXF Quick Reference		
Jumper	**Description**	**Default Setting**
JBT1	CMOS Clear	See Section 5-9
JBMC1	BMC and Video Enable Header	Pins 1-2 (Enabled)
JI2C1/JI2C2	I2C to PCI/PCI-E Slots	Both Closed (Enabled)
JPL1	LAN Controller Enable/Disable	Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1-2 (Reset)
JIB1	InfiniBand Enable/Disable (H8DMT/H8DMT-	Pins 1-2 (Enabled)

Connector	**Description**
COM1/COM2	COM1 Serial Port/Header
Fan 1-4	Chassis/CPU Fan Headers
J2	Auxiliary Power Connector (for IDE drives)
JF1	Front Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat Warning Header
JWOL	Wake-On-LAN Header
JWR1	20-Pin Proprietary Power Connector
JWR2	20-Pin Proprietary Power Connector
LAN1/2	Gigabit Ethernet (RJ45) Ports
Dedicated LAN	Gigabit Ethernet (RJ45) Port
PWR I2C	I2C Power Connector
SATA0 ~ SATA3	SATA Ports
SMBus	System Management Bus Header
T-SGPIO-1	Serial General Purpose I/O Headers (for SATA)
USB0/1, USB2/3/4/5	Universal Serial Bus (USB) Ports, Headers

LED	**Description**
DP4	Onboard Power LED
LE2	InfiniBand Physical Link LED (Red)
LE3	InfiniBand Logical Link LED (Yellow)

5-9   Connector Definitions

Main ATX Power Supply Connector

The proprietary power supply connector (JWR1 and JWR2) meets the SSI (Superset ATX) 20-pin specification. Refer to the table on the right for the pin definitions of the ATX 20-pin power connector. This connection supplies power to the chipset, fans and memory.

ATX Power 20-pin Connector Pin Definitions (JPW1/JPW2)			
Pin #	Definition	Pin #	Definition
1	GND	11	PS_ON_N
2	GND	12	5V_STBY
3	GND	13	GND
4	GND	14	GND
5	GND	15	GND
6	NC	16	NC
7	12V	17	12V
8	12V	18	12V
9	12V	19	12V
10	12V	20	12V

Auxiliary Power Connector

A 4-pin 12V auxiliary power connector (J2) is included to provide power to hard drive disks. See the table to the right for pin definitions.

+12V 4-pin Power Pin Definitions (J2)	
Pin#	Definition
1	+12V
2	Ground
3	Ground
4	+5V

Required Connection

Power Button

The Power On connection is on pins 1 and 2 of JF1. This header should be connected to the chassis power button. See the table to the right for for pin definitions.

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

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See 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	Vcc
6	Ground

Overheat/Fan Fail LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF1 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	Ground

OH/Fan Fail Indicator Status	
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	Vcc
10	Ground

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	Vcc
12	Ground

HDD LED

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

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

Power On LED

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

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

NMI Button

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

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

Universal Serial Bus (USB)

Two Universal Serial Bus ports (USB 2.0) are located beside the LAN1/2 ports. Two additional ports (USB4/5) are included on the serverboard near the COM2 header.

Two USB 2.0 headers (USB2/3) are also included on the motherboard. These may be connected to provide front side access. A USB cable (not included) is needed for the connection.

See the tables on the right for pin definitions.

Back Panel USB (USB 0/1, 4/5)	
Pin#	Definitions
1	+5V
2	PO-
3	PO+
4	Ground

USB Headers (USB 2/3) Pin Definitions			
USB 2		USB 3	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	Key	5	N/C

Serial Ports

Two serial ports are included on the serverboard. COM1 is a backpanel port and COM2 is a header located on the serverboard. See the table on the right for pin definitions.

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

NC = No Connection

Fan Headers

The H8DMT has four 4-pin proprietary fan headers. Each fan header supports one 4-pin fans with PWM mode. See the table to the right for pin definitions. Pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans. (Fan speed control is supported with 4-pin fans only.)

The onboard fan speeds are controlled by Thermal Management (via Hardware Monitoring) under the Advanced Section in the BIOS. The default is disabled.

Fan Header Pin Definitions (FAN1-4)	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

Ethernet LAN Ports

Two Gigabit Ethernet LAN ports (designated LAN1 and LAN2) are located beside the COM 1port. A dedicated LAN is located above the USB ports on the H8DMT-F/ H8DMT-IBXF serverboards as a Dedicated LAN port for IPMI use.

All these ports accept RJ45 type cables. Please refer to the LED Indicator Section for LAN LED information.

Overheat LED/Fan Fail (JOH1)

The JOH1 header is used to connect an LED to provide warning of chassis overheating. Refer to the table on right for LED status and pin definitions.

Overheat LED Pin Definitions (JOH1)	
Pin#	Definition
1	3.3V
2	OH Active

Chassis Intrusion

The Chassis Intrusion header is designated JL1. 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

Wake-On-LAN

The Wake-On-LAN header is designated JWOL on the serverboard. See the table on the right for pin definitions. You must also have a LAN card with a Wake-On-LAN connector and cable to use this feature.

Wake-On-LAN Pin Definitions (JWOL)	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

SMBus Header

The header at SMBus is for the System Management Bus for the H8DMT-F/H8DMT-IBXF serverboards. Connect the appropriate cable here to utilize SMB on the system. See the table on the right for pin definitions.

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

SGPIO Headers

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

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

NC = No Connection

Power I2C Header

The JPI2C header is for power I2C, which may be used to monitor the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

Power I2C Header Pin Definitions (JPI2C)	
Pin#	Definition
1	Clock
2	Data
3	Power Fail
4	Ground

5-10 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.
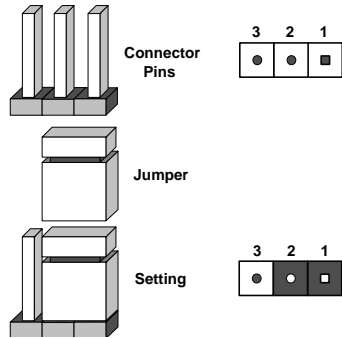
CMOS Clear

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.*

LAN1/2 Enable/Disable

Change the setting of jumper JPL to enable or disable the LAN Ethernet ports on the serverboard. See the table on the right for jumper settings. The default setting is enabled.

JLAN1/2 Enable/Disable Jumper Settings (JPL)	
Jumper Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

BMC/Video Enable/Disable

JBMC1 connector allows you to enable or disable the IPMI and Video. The default position is on for both pin 1 and pin 2 to enable both IPMI and VGA. See the table on the right for jumper settings.

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

I^{2}C Bus to PCI-X/PCI-Exp. Slots

Jumpers JI^{2}C1 and JI^{2}C2 allow you to connect the System Management Bus (I^{2}C) to the PCI-Express slots. The default setting is Open (Disabled.) Both jumpers must be set to the same setting See the table on the right for jumper settings.

I^{2}C to PCI-X/PCI-E Slots Jumper Settings (J12/J13)		
Jumper Settings		Definition
JI2C1: Closed	JI2C2:Closed	Enabled
JI2C1: Open	JI2C2: Open	Disabled

Watch Dog Enable/Disable

Jumper J21 controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause WD to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Watch Dog Jumper Settings (J21)	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

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

InfiniBand Port Enable/Disable

JIB1 enables or disables the InfiniBand port on the H8DMT/H8DMT-IBX Serverboards. The default position is on pins 1 and 2 to enable the port. See the table on the right for jumper settings.

InfiniBand Port Enable/ Disable Jumper Settings (JIB1)	
Jumper Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

5-11 Onboard Indicators

LAN LEDs

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

JLAN1/2 LED (Connection Speed Indicator)	
LED Color	Definition
Off	NC or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

Onboard Power LED (DP4)

An Onboard Power LED is located at DP4. This LED Indicator is lit when the system is on. Be sure to unplug the power cable before removing or adding any components. See the table on the right for more details.

Onboard PWR LED Indicator (DP4)	
LED Color	Definition
Off	System Off (PWR cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State
Green: Flashing Slowly	ACPI S3 (STR) State

IPMI Dedicated LAN LEDs

An additional IPMI Dedicated LAN is also above the external USB ports. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the table at right for more information.

IPMI LAN

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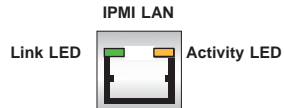
IPMI LAN Link LED (Left) & Activity LED (Right)		
LED	Status	Definition
Link (Left)	Green: Solid	100 Mbps
Activity (Right)	Amber: Blinking	Active

InfiniBand LED Indicators

Two InfiniBand LED indicators (LE2/LE3) are located near the InfiniBand port of the H8DMT/H8DMT-IBX Serverboards. The green LED (LE2) is the InfiniBand link LED while the yellow LED (LE3) indicates activity. See the table on the right for details.

InfiniBand LED Indicators (LE2/LE3)	
LED Color	Definition
Green: Off	No Connection
Green: On	InfiniBand Connected
Yellow: Solid	InfiniBand Active
Yellow: Dim	InfiniBand Connected, Activity Idle
Yellow: Off	No Connection

5-12 SATA Ports

SATA Ports

There are no jumpers to configure the SATA ports, which are designated SATA0 through SATA3. See the table on the right for pin definitions.

SATA Port Pin Definitions (I-SATA0~I-SATA5)	
Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

5-13 Installing Software

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

Figure 5-5. Driver/Tool Installation Display Screen

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

Supero Doctor III

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

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

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

Figure 5-6. Supero Doctor III Interface Display Screen (Health Information)
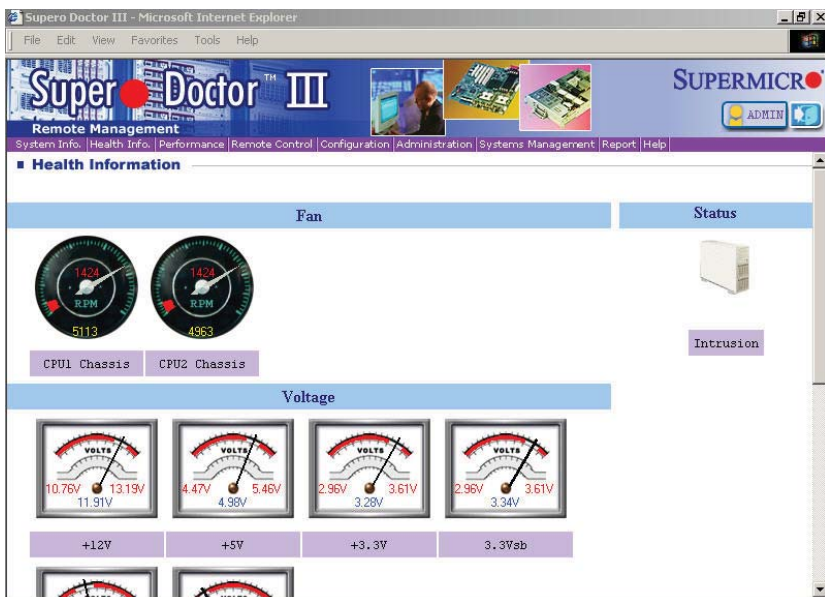
Figure 5-7. Supero Doctor III Interface Display Screen (Remote Control)

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

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC827-R1200B chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

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

6-1 Static-Sensitive Devices

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

Precautions

- Use a grounded wrist strap designed to prevent static discharge.

- Touch a grounded metal object before removing any board from its antistatic bag.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.

- When handling chips or modules, avoid touching their pins.

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

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

Unpacking

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

Figure 6-1. Front and Rear Chassis Views

Control Panel   **Control Panel**

Control Panel   **SATA Drives (12)**   **Control Panel**

Ethernet Ports   **IPMI LAN Port**

COM1 Port   VGA Port   **USB Ports   Infiniband Port**
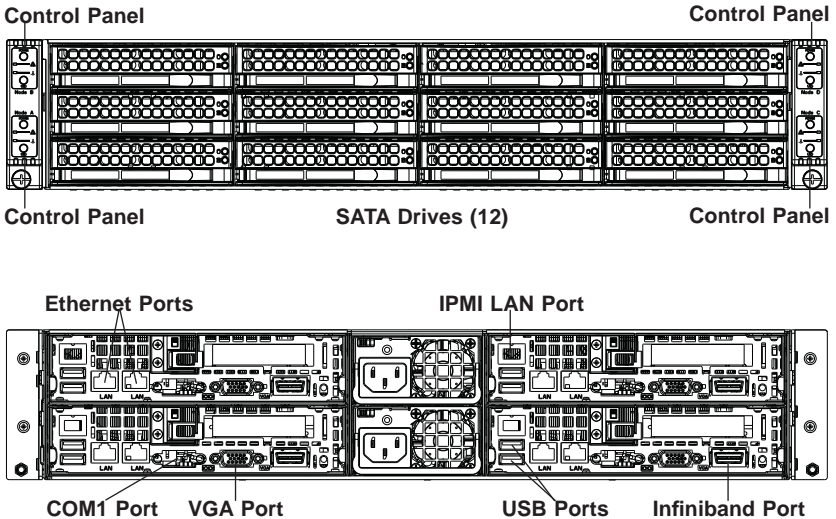
6-2   Control Panel

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

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

6-3   Chassis Cover

Figure 6-2: Removing the Chassis Cover
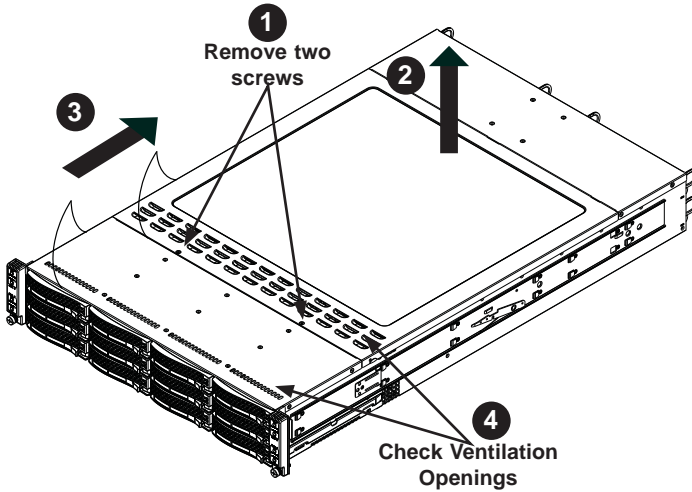
Before operating the SC827 chassis for the first time, it is important to remove the protective film covering the top of the chassis, in order to allow for proper ventilation and cooling.

Removing the Chassis Cover and Protective Film

1. Remove the two screws which secure the top cover onto the chassis as shown above.

2. Lift the top cover up and off the chassis.

3. Peel off the protective film covering the top cover and the top of the chassis

4. Check that all ventilation openings on the top cover and the top of the chassis are clear and unobstructed.

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

6-4   Air Guides

The air guides concentrate and maximize air flow in the chassis. These air guides do not require screws to set up, but rather attaches to the serverboard by two tabs on the air guides. The SC827 chassis requires four identical air guides, one in each motherboard drawer. Air guides vary depending upon the motherboard used. See the illustrations below.

Installing an Air Guide

1. Confirm that all four fans are in place and are working properly

2. Place the first air guide into the motherboard drawer. It attaches behind the system fans and attaches by two tabs over the top of the motherboard and its components.

3. Repeat the procedure for the remaining three motherboard drawers.

6-5   Checking the Airflow

Checking Airflow

1. Make sure there are no objects to obstruct airflow in and out of the server. In addition, if you are using a front bezel, make sure the bezel's filter is replaced periodically.

2. Do not operate the server without drives or drive trays in the drive bays. Use only recommended server parts.

3. Make sure no wires or foreign objects obstruct airflow through the chassis. Pull all excess cabling out of the airflow path or use shorter cables.

4. The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons.

Installation Complete

In most cases, the chassis power supply and fans are pre-installed. If you need to install fans or power supplies, continue to the Systems Fan and Power Supply sections of this chapter. If the chassis will be installed into a rack, continue to the next chapter for rack installation instructions.

6-6   System Fans

Four fans provide cooling for the chassis. These fans circulate air through the chassis as a means of lowering the chassis internal temperature. The SC827 system fans are hot-swappable. There is no need to power down the system when replacing fans and new tools are required for installation.

Optional Fan Configurations

The SC827B model chassis is designed so that the default configuration of the system is for each motherboard to control two fans. The fans are hot-swappable. Each motherboard node in the chassis is connected to the backplane through the adapter card, mounted in the motherboard drawer. In the event that one of the motherboard drawers is removed, then the remaining motherboard will operate both fans.

Figure 6-4: System Fan Placement
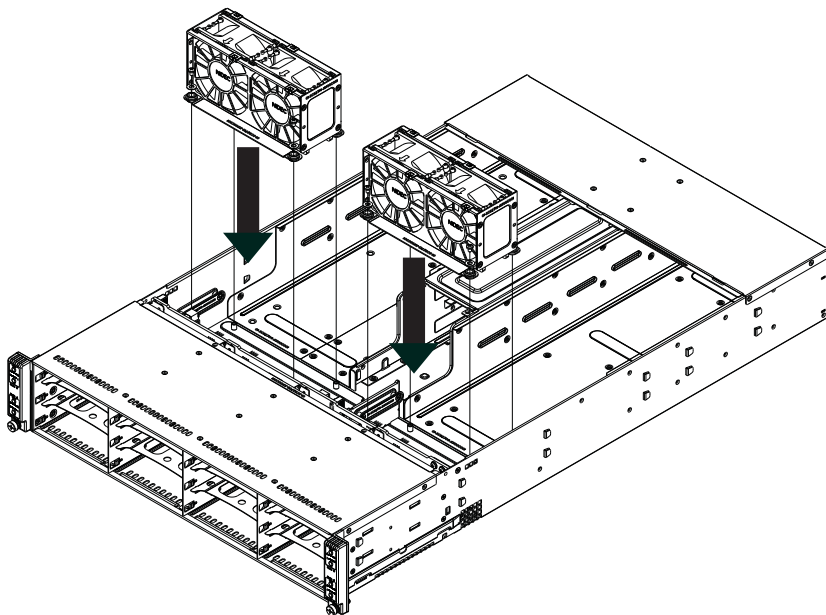
Fan Configurations Options
SC827B Hot-Swappable Default Configuration
Fan A connected to bplane, bplane connected to Node A by adapter card
Fan B connected to bplane, bplane connected to Node B by adapter card
Fan C connected to bplane, bplane connected to Node C by adapter card
Fan D connected to bplane, bplane connected to Node D by adapter card

Changing a System Fan

1. If necessary, open the chassis while the power is running to determine which fan has failed. (Never run the server for an extended period of time with the chassis cover open.)

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

3. Lift the fan housing up and out of the chassis.

4. Push the fan up from the bottom and out of the top of the housing.

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

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

Figure 6-5: Replacing a System Fan in the Fan Housing
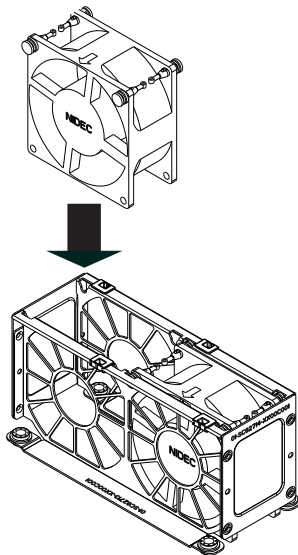
6-7   Removing and Installing the Backplane

The SC827 chassis backplane is located behind the hard drives and in front of the front system fans. In order to change jumper settings on the backplane, it may be necessary to remove the backplane from the chassis.

Removing the Backplane

Removing the Backplane from the Chassis

1. Power down and unplug the system from any power source.

2. Remove the chassis cover.

3. Disconnect the cabling to the backplane.

4. Remove all of the hard drive trays from the front of the chassis.

5. Remove the four upper screws at the top of the backplane, indicated by the arrows below.

Figure 6-6: Removing the Screws at the Top of the Backplane
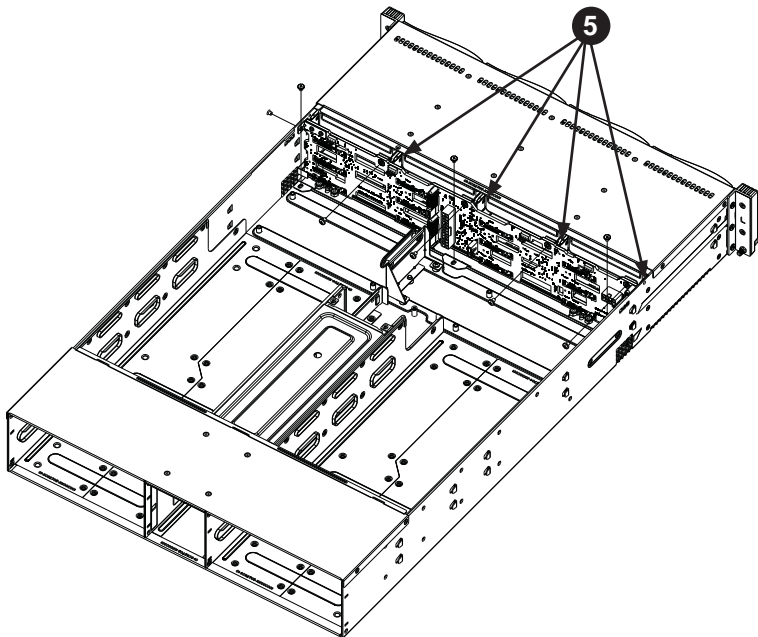
6. Loosen the three screws in the spring bar, located on the floor of the chassis, indicated by the arrows below.

Figure 6-7: Loosening the Spring Bar Screws in the Floor of the Chassis
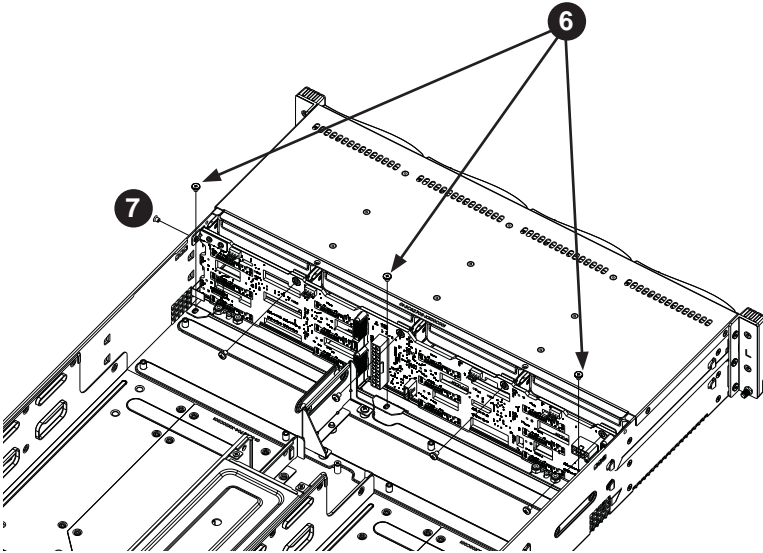
7. Remove the side screw from the side of the chassis.

Figure 6-8: Removing the Backplane from the Chassis
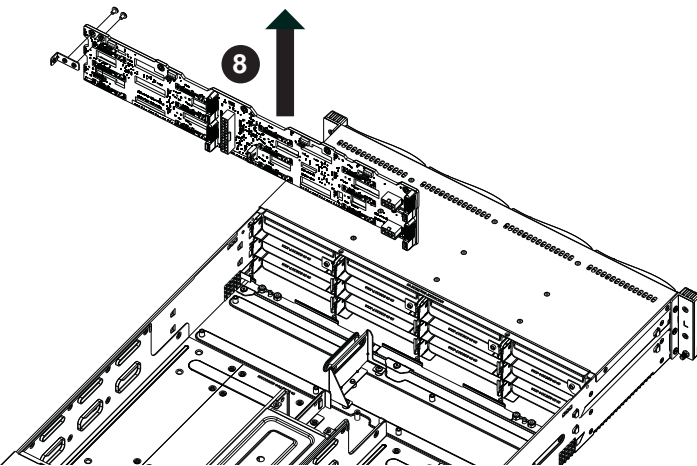
8. Gently ease the backplane up and out of the chassis.

### Installing the Backplane

Installing the Backplane into the Chassis

1. Ensure that all of the hard drive trays have been removed from the bays in the front of the chassis and that the spring bar has been loosened as directed in the previous section.

2. Secure the side mounting bracket to the backplane with the two screws provided.

3. Slide the backplane into the chassis at a slight angle, pushing it up against the side of the chassis.

4. Ease the backplane forward, against the front of the chassis. This will aid in the alignment of the mounting holes.

5. Align the mounting holes in the backplane with the holes in the chassis. Replace the four screws at the top of the backplane and the screw on the side of the chassis.

6. Adjust the spring bar, then tighten the spring bar screws in the floor of the chassis.

7. Replace the side screw in the side of the chassis

8. Reconnect all cables and return the hard drive trays to their bays in the front of the chassis.

Figure 6-9: Installing the Backplane
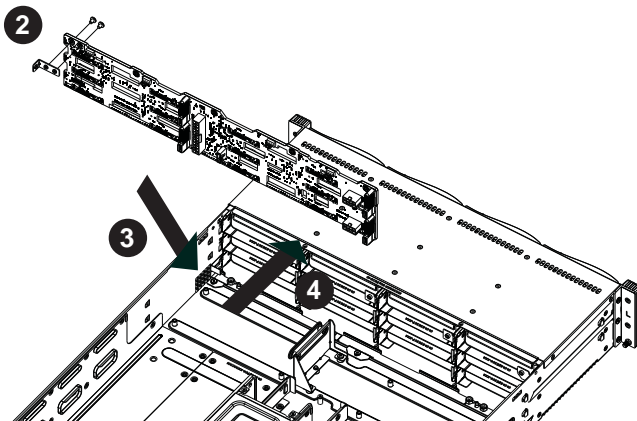
6-8   Installing the Motherboard

Figure 6-10: I/O Shield Placement
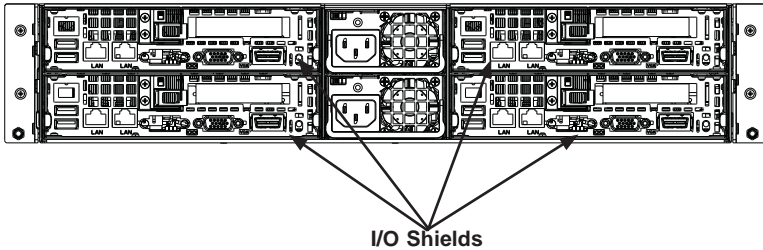
I/O Shields

I/O Shield

The I/O shield holds the motherboard ports in place. The I/O shield does not require installation.

Permanent and Optional Standoffs

Standoffs prevent short circuits by securing space between the motherboard and the chassis surface. The SC827 chassis includes permanent standoffs in locations used by the motherboards. These standoffs accept the rounded Phillips head screws included in the SC827 accessories packaging.

Some motherboards require additional screws for heatsinks, general components and/ or non-standard security. Optional standoffs are used for these motherboards.

To use an optional standoff, you must place a hexagon screw through the bottom the chassis and secure the screw with the hexagonal nut (rounded side up).

Depending upon the configuration of the motherboard being used, it is also possible that some of the optional standoffs which are pre-installed in the chassis, may need to be removed.

Figure 6-11: Installing the Motherboard in the Motherboard Node Drawer
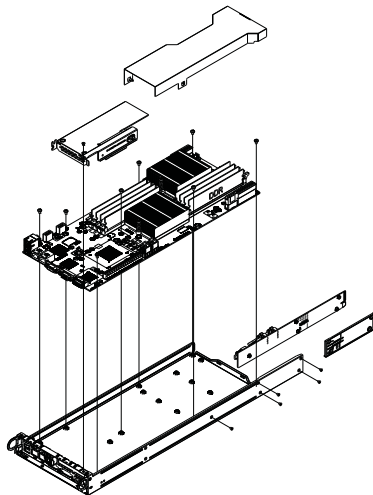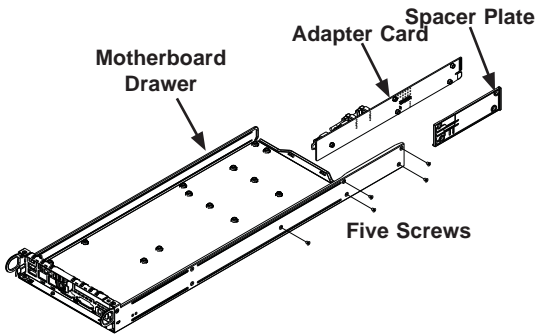

Installing the Motherboard

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, precautions, and cable connections.

2. Pull the motherboard drawer out of the back of the chassis.

3. Remove the add-on card brackets:
   3a. Remove screw securing the add-on card bracket to the back of the drawer.
   3b. Lift the bracket out of the drawer.
   3c. Repeat this process for the second riser card.

4. Lay the first motherboard in the drawer aligning the standoffs with the motherboard.

5. Secure the motherboard to the drawer using the rounded, Phillips head screws included for this purpose.

6. Repeat steps 3 - 5 for the remaining drawers.

7. Secure the CPU(s), heatsinks, and other components to the motherboard as described in the motherboard documentation.

8. Connect the cables between the motherboard, backplane, chassis, front panel, and power supply, as needed. Also, fans may be temporarily removed to allow access to the backplane ports.

9. Replace the add-on card bracket and secure the bracket with a screw.

6-9   Adapter Card Replacement

Each motherboard drawer comes equipped with an adapter card which plugs into the backplane. In the unlikely event that the adapter card needs to be replaced, installation requires only a Phillips head screwdriver.

Figure 6-12: Adapter Card Installation

Removing the Adapter Card

1. Disconnect the wiring connecting the adapter card to the motherboard.

2. Remove the motherboard drawer from the chassis.

3. Remove the motherboard from the motherboard drawer by removing the screws securing it to the drawer. Set the screws aside for later use.

4. Remove the five screws securing the adapter card and the spacer plate to the drawer and set them aside for later use.

5. Remove the adapter card and spacer plate from the motherboard drawer.

6. Set the spacer plate aside for later use.

Installing the Adapter Card

1. Place the adapter card and spacer plate in the motherboard drawer, aligning the holes in the spacer and the adapter card with the holes in the motherboard drawer.

2. Secure the adapter card and spacer plate to the motherboard drawer, using the five screws which were previously set aside.

3. Reconnect the wiring from the motherboard to the adapter card.

4. Return the motherboard drawer to the closed position in the chassis.

Add-on Card/Expansion Slot Setup

The SC827 chassis includes I/O slots for add-on cards and expansion cards. Each side supports one low profile/half length add-on card for a total of four per chassis, one per drawer.

Figure 6-13: I/O Shield Placement

PCI Slot Shield

Add-on Card Slot Clip
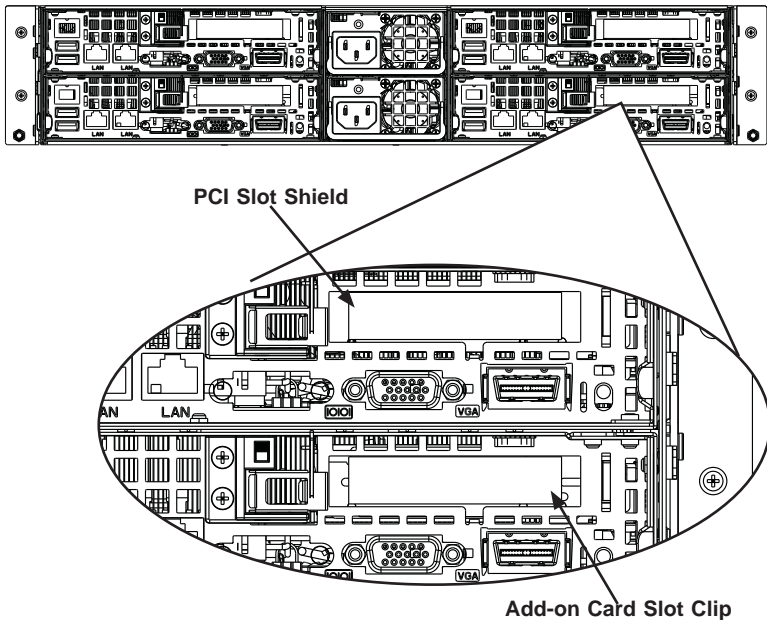
Installing Add-on Cards

1. Disconnect the power supply, lay the chassis on a flat surface, and open the chassis cover.

2. Pull open the add-on card slot clip in the rear of the chassis.

3. Slide the temporary PCI slot shield toward the slot clip and remove the temporary shield from the chassis.

4. Connect the add-on card to the riser card.

5. Secure the riser card to the motherboard tray using the riser card screw.

6. Slide the add-on card bracket into the rear add-on card slot and secure with the add-on card bracket screws.

7. Close the add-on card slot clip.

Note: Under normal circumstances, the riser card and add-on card bracket are not separated.

Figure 6-14: Installing the Low Profile Add-On Card
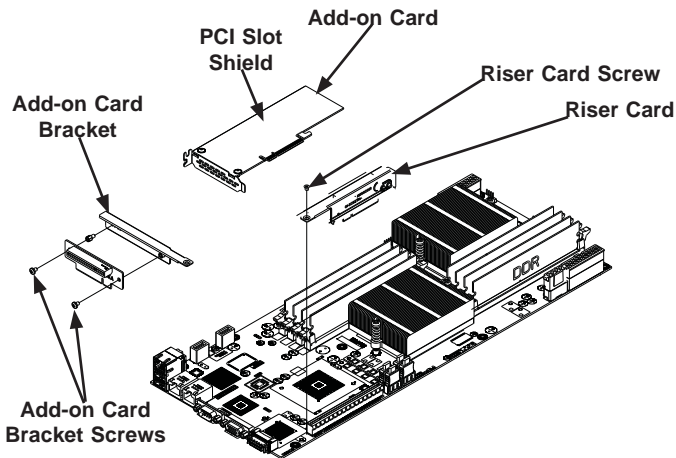
6-10 Drive Bay Installation/Removal

Accessing the Drive Bays

SATA Drives: You do not need to access the inside of the chassis or remove power to replace or swap SATA drives. Proceed to the next step for instructions. You must use standard 1" high, SATA drives in the system.

Note: Refer to the following FTP site for setup guidelines: <ftp://ftp.supermicro.com/driver/SAS/LSI/LSI_SAS_EmbMRAID_SWUG.pdf> and Supermicro's web site for additional inmformation < http://www.supermicro.com/support/manuals/>.

DVD-ROM: For installing/removing the DVD-ROM drive, you will need to gain access to the inside of the server by removing the top cover of the chassis. Proceed to the "DVD-ROM Installation" section later in this chapter for instructions.

The SC827 chassis contains four individual motherboards in separate node drawers. Each motherboard node controls a set of three hard drives. Note that if a motherboard node drawer is pulled out of the chassis, the hard drives associated with that node will power down as well.

Motherboard Drawer Locations in the Chassis	
Motherboard B **Controls HDDs B1, B2 and B3**	**Motherboard D** **Controls HDDs D1, D2 and D3**
Motherboard A **Controls HDDs A1, A2 and A3**	**Motherboard C** **Controls HDDs C1, C2 and C3**

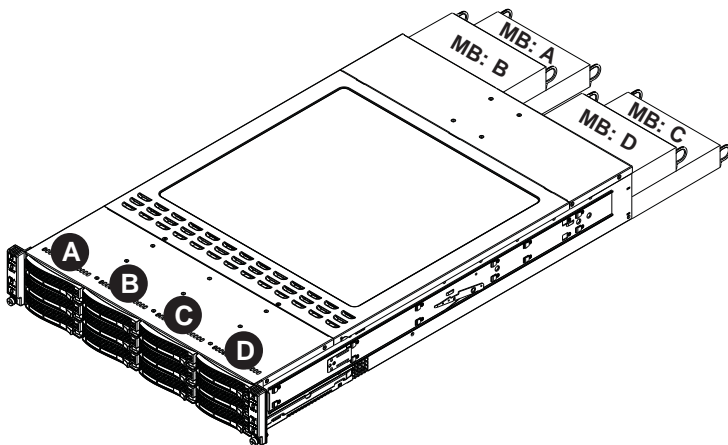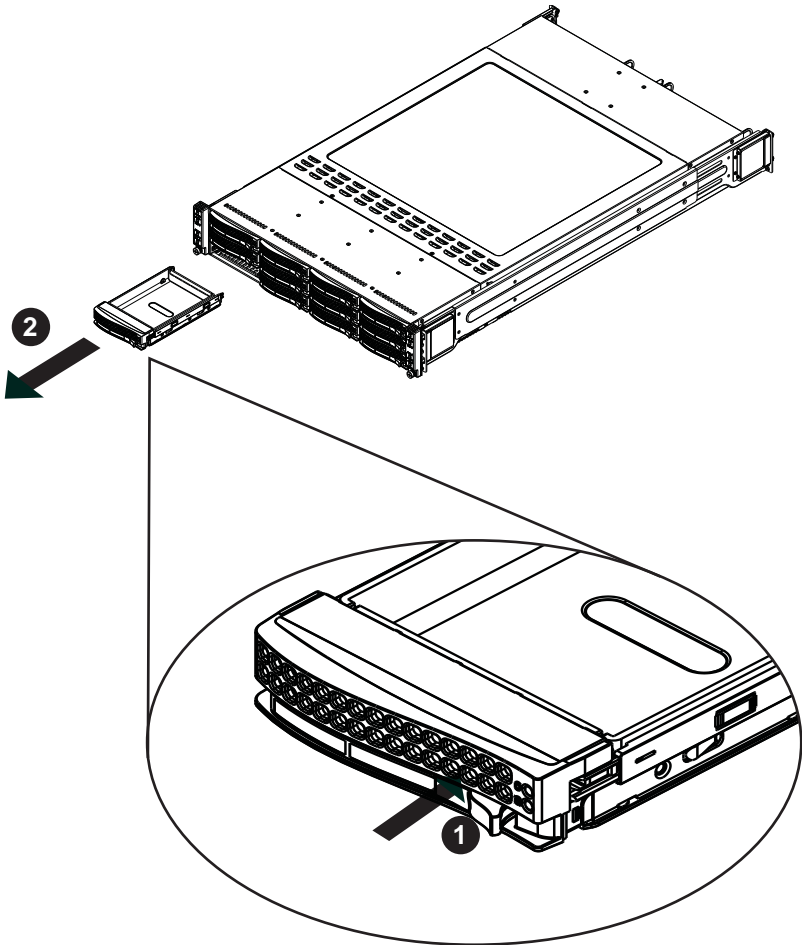**Figure 6-15: Hard Drives and the Corresponding Motherboards**
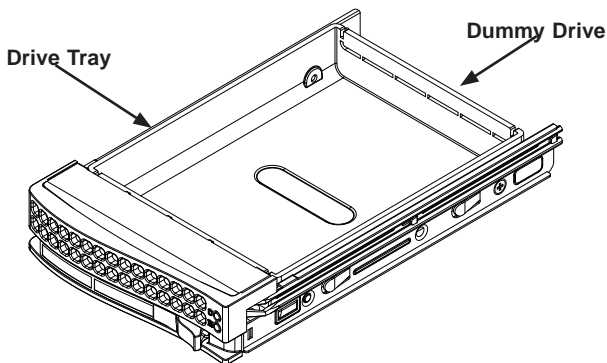
Figure 6-16: Removing Hard Drive

Removing Hard Drive Trays from the Chassis

1. Press the release button on the drive tray. This extends the drive bay handle.

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

**Figure 6-17: Chassis Drive Tray**

The 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.

Warning: Except for short periods of time while swapping hard drives, do not operate the server with the hard drives empty.
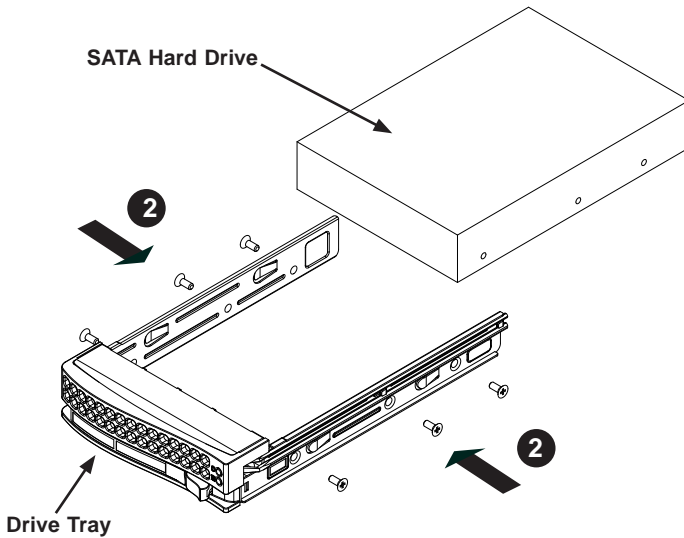
Figure 6-18: Removing Dummy Drive from Tray
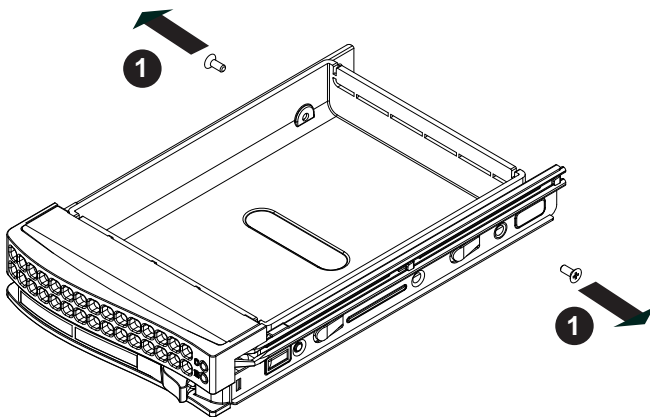
Installing a Drive into the Hard Drive Tray

1. Remove the screws (2) holding connecting the drive tray the carrier.

2. Remove the tray from the carrier.

Figure 6-19: Installing the Hard Drive

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

2. Secure the hard drive by tightening all six (6) screws.

3. Use the open handle to replace the drive tray into the chassis. Make sure the close the drive tray handle.

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

6-11 Power Supply

Depending on your chassis model, the SC827 chassis will include two 1200W power suppies. This power supply is auto-switching capable. This enables it to automatically sense and operate at a 100v to 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

Power Supply Replacement

The SC827 chassis utilizes two redundant power supplies. In the unlikely event that the power supply unit needs to be replaced, one power supply can be removed, without powering down the system. Replacement units can be ordered directly from Supermicro (See the contact information in the Preface of this manual).

Changing the Power Supply

1. Power down all four nodes and unplug the power cord.

2. Push the release tab (on the back of the power supply) as illustrated.

3. Pull the power supply out using the handle provided.

4. Push the new power supply module into the power bay until you hear a click.

5. Plug the AC power cord back into the module and power up the nodes.

Figure 6-20: Changing the Power Supply

Release Tab
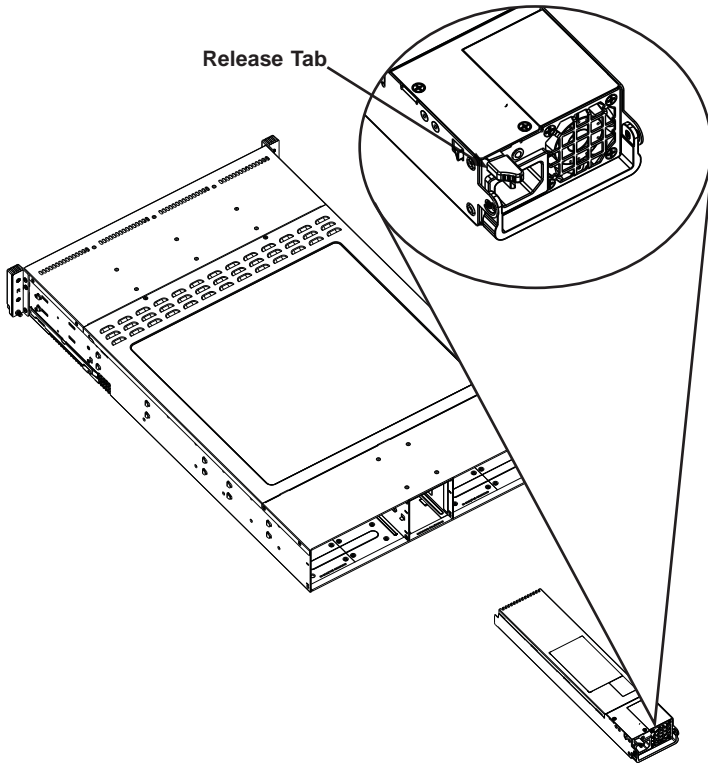
Chapter 7

BIOS

7-1   Introduction

This chapter describes the AMI BIOS Setup Utility for the H8DMT-F/H8DMT-IBXF-F. 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. (**Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

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

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

How To Change the Configuration Data

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

Starting the Setup Utility

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

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

7-2   Main Setup

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

System Overview: The following BIOS information will be displayed:

System Time/System Date

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

Supermicro H8DMT-F/H8DMT-IBXF

BIOS Build Version: This item displays the BIOS revision used in your system.

BIOS Build Date: This item displays the date when this BIOS was completed.

AMI BIOS Core Version: This item displays the revision number of the AMI BIOS Core upon which your BIOS was built.

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.

- Micro_code Revision: This item displays the revision number of the BIOS Micro_code used in your system.

System Memory

This displays the size of memory available in the system:

- Size: This item displays the memory size detected by the BIOS.

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

AMIBIOS

Version

Build Date

Processor

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

Type of Processor

Speed

Physical Count

Logical Count

System Memory

This displays the size of memory available in the system:

Populated Size

Available Size

7-3   Advanced Setup Configurations

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

▶ BIOS Features

Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

Quiet Boot

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

OS Installation

Change this setting if using a 64-bit Linux operating system. The available options are **Other** and Linux.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at boot and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

Wait For 'F1' If Error

This setting controls the system response when an error is detected during the boot sequence. When enabled, BIOS will stop the boot sequence when an error is detected, at which point you will need to press the F1 button to re-enter the BIOS setup menu. The options are **Enabled** and Disabled.

ACPI Mode

Use this setting to determine whether ACPI mode will be used. The options are **Yes** and No.

▶ Advanced ACPI Configuration Options

MCP55 ACPI HPET Table

Determines whether to enable or disable the MCP55 ACPI HPET table. Options are **Enabled** or Disabled.

ACPI Version Features

Use this setting the determine which ACPI version to use. Options are **ACPI v1.0**, ACPI v2.0 and ACPI v3.0.

ACPI APIC Support

Determines whether to include the ACPI APIC table pointer in the RSDT pointer list. The available options are **Enabled** and Disabled.

AMI OEMB Table

Determines whether to include the AMI OEMB table pointer in the RSDT pointer list. The available options are **Enabled** and Disabled.

Headless Mode

Use this setting to Enable or Disable headless operation mode through ACPI. This setting is used to update the ACPI FACP table to indicate headless operations without a monitor. Options include Enabled and **Disabled**.

▶ General WHEA Configuration Options

WHEA Support

Use this setting to Enable or Disable WHEA (Windows Hardware Error Architecture) support. WHEA provides a common infrastructure for reporting hardware errors on Windows platforms and was designed to improve recovery following fatal hardware errors. Options include **Enabled** and Disabled.

Power Button Mode

Allows the user to change the function of the power button. Options are **On/Off** and Suspend.

Watch Dog Timer Select

This setting is used to Enable or Disable the Watch Dog Timer function. It must be used in conjunction with the Watch Dog jumper (see Chapter 2 for details). Options include **Disabled**, and choose from 1, 2, 3, 4, 8, 15 or 30 min to enable.

Restore on AC Power Loss

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are Power Off, Power On and **Last State**.

MPS Revision

This setting allows the user to select the MPS (MultiProcessor Specification) revision level. The options are 1.1 and **1.4**.

▶ SATA Configuration

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

Serial ATA Devices

This setting is used to determine if SATA drives will be used and how many. Options are Disabled, Device 0 and **Device 0/1**.

nVidia RAID Function

This setting is used to Enable or Disable the nVidia ROM. If enabled, the setting below will appear. Options include Enabled and **Disabled**.

▶ SerialATA 0/1 Primary/Secondary Channel

This setting is used to Enable or Disable the SATA0 Primary, SATA0 Secondary, SATA1 Primary and SATA1 Secondary, channels (four settings total). If enabled, the following settings will appear: Options include Enabled and **Disabled**.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block mode boosts 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 the data to be transferred from and to the device one sector at a time. Select Auto to allows the data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

PIO Mode

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 BIOS to auto detect the PIO mode.

Use this value if the IDE disk drive support cannot be determined. Select 0 to allow BIOS to use PIO mode 0, which has a data transfer rate of 3.3 MBs. Select 1 to allow BIOS to use PIO mode 1, which has a data transfer rate of 5.2 MBs. Select 2 to allow BIOS to use PIO mode 2, which has a data transfer rate of 8.3 MBs. Select 3 to allow BIOS to use PIO mode 3, which has a data transfer rate of 11.1 MBs. Select 4 to allow BIOS to use PIO mode 4, which has a data transfer rate of 16.6 MBs.

This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.

DMA Mode

Selects the DMA Mode. Options are **Auto**, SWDMA0, SWDMA1, SWDMA2, MWDMA0. MDWDMA1, MWDMA2, UDMA0. UDMA1, UDMA2, UDMA3, UDMA4 and UDMA5. (SWDMA=Single Word DMA, MWDMA=Multi Word DMA, UDMA=UltraDMA.

S.M.A.R.T.

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

32-Bit Data Transfer

Select **Enabled** to activate the 32-Bit Data Transfer function. Select Disabled to deactivate the function. The options are **Enabled** and Disabled.

▶ PCI/PnP Configuration

Slot 1 OPROM

Use this setting to enable or disable the OPROM (Option ROM firmware) for slot 1. The options are **Yes** and No.

Load Onboard LAN Option ROM

Use this setting to Enable or Disable the onboard option ROM. This setting must be enabled to view the Boot Menu settings. Options include Enabled and **Disabled**.

Clear NVRAM

This feature clears 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.

▶ North Bridge Configuration

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

▶ Memory Configuration

Bank Interleaving

Select Auto to automatically enable a bank-interleaving memory scheme when this function is supported by the processor. The options are **Auto** and Disabled.

Channel Interleaving

Selects the channel-interleaving memory scheme when this function is supported by the processor. The options are Disabled, Address Bits 6, Address Bits 12, **XOR of Address Bits [20:16, 6]** and XOR of Address Bits [20:16, 9].

Enable Clock to All Dimms

Use this setting to enable unused clocks to all DIMMSs, even if some DIMM slots are unpopulated. Options are Enabled and **Disabled**.

Mem Clk Tristate C3/ALTVID

Use this setting to Enable or Disable memory clock tristate during C3 and ALT VID. Options are Enabled and **Disabled**.

Memory Hole Remapping

When Enabled, this feature enables hardware memory remapping around the memory hole. Options are **Enabled** and Disabled.

CS Sparing

This setting will reserve a spare memory rank in each node when enabled. Options are Enabled and **Disabled**.

DCT Unganged Mode

This setting enables unganged DRAM mode (64-bit). Options are Auto (ganged mode) and **Always** (unganged mode).

Power Down Enable

This setting enables or disables the DDR power down mode. Options are **Enabled** and Disabled.

Power Down Mode

This sets the power down mode. Options are **Channel** and Chip Select.

▶ **ECC Configuration**

ECC Mode

This setting affects the DRAM scrub rate based on its setting. Options are Disabled, **Basic**, Good, Super, Max and User. Depending upon the setting chosen, some or all of the following settings will become active:

DRAM ECC Enable

DRAM ECC allows hardware to report and correct memory errors automatically. Options are **Enabled** and Disabled.

DRAM SCRUB Redirect

Allows system to correct DRAM ECC errors immediately, even with background scrubbing on. Options are **Enabled** and Disabled.

4-Bit ECC Mode

Allows the user to enabled 4-bit ECC mode (also known as ECC Chipkill). Options are Enabled and **Disabled**.

DRAM BG Scrub

Corrects memory errors so later reads are correct. Options are **Disabled** and various times in nanoseconds and microseconds.

Data Cache BG Scrub

Allows L1 cache RAM to be corrected when idle. Options are **Disabled** and various times in nanoseconds and microseconds.

L2 Cache BG Scrub

Allows L2 cache RAM to be corrected when idle. Options are **Disabled** and various times in nanoseconds and microseconds.

L3 Cache BG Scrub

Allows L3 cache RAM to be corrected when idle. Options are **Disabled** and various times in nanoseconds and microseconds.

▶ DRAM Timing Configuration

Memory Clock Mode

This setting specifies the memory clock mode. Options are **Auto**, Limit and Manual.

DRAM Timing Mode

This setting specifies the DRAM timing mode. Options are **Auto** and DCT.

▶ IOMMU Option Menu

IOMMU Mode

Used to disable or set the GART size in systems without AGP. Options are **AGP Present**, Disabled, 32 MB, 64 MB, 128 MB, 256 MB, 512 MB and 1 GB.

▶ SouthBridge/MCP55 Configuration

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

CPU/LDT Spread Spectrum

Enables spread spectrum for the CPU/LDT. Options are **Center Spread**, Down Spread or Disabled.

PCIE Spread Spectrum

Allows you to Enable or Disable spread spectrum for PCI-Express. Options are **Enabled** and Disabled.

SATA Spread Spectrum

Enables spread spectrum for the SATA. Options are **Enabled** and Disabled.

USB 1.1 Controller

Select Enabled to activate the onboard USB 1.1 controller. The options are **Enabled** and Disabled. (The manufacturer's default setting is **Enabled**.).

USB 2.0 Controller

Select Enabled to activate the onboard USB 2.0 controller. The options are **Enabled** and Disabled. (The manufacturer's default setting is **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, and vise versa. The settings are Disabled, and **Enabled**.

▶ Processor and Clock Options

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

MTRR Mapping

This determines the method used for programming CPU MTRRs when 4 GB or more memory is present. The options are **Continuous**, which makes the PCI hole non-cacheable, and Discrete, which places the PCI hole below the 4 GB boundary.

Thermal Throttling

Used to Enable or Disable thermal to generate a power management event. Options are Enabled and **Disabled**.

Power Now

This setting is used to Enable or Disable the AMD Power Now feature. Options are Enabled and **Disabled**.

Secure Virtual Machine Mode

This setting is used to Enable or Disable SVM (Secure Virtual Machine). Options are **Enabled** and Disabled.

CPU Page Translation Table

This setting is used to Enable or Disable the CPU Page Translation Table. Options are **Enabled** and Disabled.

▶ **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. The options for Serial Port1 are Disabled, **3F8/ IRQ4**, 3E8/IRQ4, 2E8/IRQ3. The options for Serial Port2 are Disabled, **2F8/IRQ3**, 3E8/IRQ4, and 2E8/IRQ3.

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.

▶ **DMI Event Logging**

View Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Mark All Events as Read

Highlight this item and press <Enter> to mark all events as read.

Clear Event Log

Select Yes and press <Enter> to clear all event logs. The options are Yes and No to verify.

▶ **Console Redirection**

Remote Access

Allows you to Enable or Disable remote access. If enabled, the other settings in the Console Redirection menu will appear. Options are Enabled and **Disabled**.

Serial Port Number

Selects the serial port to use for console redirection. Options are **COM1** and COM2.

Serial Port Mode

Selects the serial port settings to use. Options are **(115200 8, n, 1)**, (57600 8, n, 1), (38400 8, n, 1), (19200 8, n, 1) and (09600 8, n, 1).

Flow Control

Selects the flow control to be used for console redirection. Options are **None**, Hardware and Software.

Redirection After BIOS POST

Options are Disabled (no redirection after BIOS POST), Boot Loader (redirection during POST and during boot loader) and **Always** (redirection always active). Note that some OS's may not work with this set to **Always**.

Terminal Type

Selects the type of the target terminal. Options are **ANSI**, VT100 and VT-UTF8.

VT-UTF8 Combo Key Support

Allows you to Enable or Disable VT-UTF8 combination key support for ANSI/VT100 terminals. Options are **Enabled** and Disabled.

Sredir Memory Display Delay

Use this setting to set the delay in seconds to display memory information. Options are **No Delay**, 1 sec, 2 secs and 4 secs.

▶ Hardware Health Monitor

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

CPU Overheat Alarm

Use the "+" and "-" keys to set the CPU temperature threshold to between 65o and 90o C. When this threshold is exceeded, the overheat LED on the chassis will light up and an alarm will sound. The LED and alarm will turn off once the

CPU temperature has dropped to 5 degrees below the threshold set. The default setting is **72o C**.

Warning!

1. Any temperature that exceeds the CPU threshold temperature pre-defined 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 ad-equate airflow to your system.

▶ System Fan Monitor

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, and vice versa.

Fan Speed Control

This feature allows you to determine how the system will control the speed of the onboard fans. Select Workstation if your system is used as a Workstation. Select Server if your system is used as a server. Select Disable to disable the fan speed control function to allow the onboard fans to continuously run at full speed (12V). The options are **Disable (Full Speed)**, 3-pin (Server) and 3-pin (Workstation).

FAN1 Speed through FAN4 Reading

The speeds of the onboard fans (in rpm) are displayed here from fan inter-faces Fan1 through Fan4.

CPU Temperature/System Temperature

This feature displays current temperature readings for the CPU and the Sys-tem. The following items will be displayed for your reference only:

CPU 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 (i.e., 25°C). 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). User intervention: No action required.

Medium – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings. User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

High – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm. User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

Note 1:. The system may shut down if it continues for a long period to prevent damage to the CPU.

Note 2: 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: The system temperature will be displayed (in degrees in Celsius and Fahrenheit) as it is detected by the BIOS.

Voltage Monitoring

CPU1 Vcore/CPU2 Vcore, CPU1 DIMM/CPU2 DIMM, 1.5V, 3.3Vcc (V), 3.3V SB (V), 12Vcc (V), 5Vin, and Battery Voltage.

▶ IPMI Configuration

Intelligent Platform Management Interface (IPMI) is a set of common interfaces that IT administrators can use to monitor system health and to manage the system as a whole.

▶ View BMC System Event Log

Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. Use the "+" and "-" keys to navigate through the system event log. Pressing the Enter key will open the following setting:

Clear BMC System Event Log

Selecting this and pressing the Enter key will clear the BMC system event log.

▶ Set LAN Configuration

Use the "+" and "-" keys to choose the desired channel number.

▶ IP Address

Use the "+" and "-" keys to select the parameter. The IP address and current IP address in the BMC are shown.

▶ MAC Address

Use the "+" and "-" keys to select the parameter. The MAC address and current MAC address in the BMC are shown.

▶ Subnet Mask

Use the "+" and "-" keys to select the parameter. The subnet address and current subnet address in the BMC are shown.

▶ Set PEF Configuration

PEF Support

Use this setting to Enable or Disable PEF support. Options are Enabled and **Disabled**. When enabled, the following settings will appear:

PEF Action Global Control

Options are Alert, Power Down, Reset Sysytem, Power Cycle, OEM Action and Diagnostic Int.

Alert Startup Delay

Use this setting to Enable or Disable the alert startup delay.

Startup Delay

Use this setting to Enable or Disable the startup delay.

Event Message for PEF Action

Use this setting to Enable or Disable event messages for a PEF action.

BMC Watch Dog Timer Action

This setting is used to set the Watch Dog function. The options are **Disabled**, Reset System, Power Down and Power Cycle.

7-4   Boot Configuration

Use this feature to configure boot settings.

▶ Boot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device. The settings are 1st boot device, 2nd boot device, 3rd boot device, 4th boot device, 5th boot device and Disabled.

- 1st Boot Device - 1st Floppy Drive

- 2nd Boot Device - [USB: XXXXXXXXX]

▶ Hard Disk Drives

This feature allows the user to specify the boot sequence from all available hard disk drives. The settings are Disabled and a list of all hard disk drives that have been detected (i.e., 1st Drive, 2nd Drive, 3rd Drive, etc).

7-5   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. The options are:

- **Full Access**: grants full User read and write access to the Setup Utility,

- View Only: allows access to the Setup Utility, but cannot change the fields,

- Limited: allows only limited fields to be changed such as Date and Time,

- No Access: prevents User access to the Setup Utility.

Change User Password

Select this feature and press <Enter> to access the submenu, and then 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

This item allows you to check a password after it has been entered. The options are **Setup** and Always.

Boot Sector Virus Protection

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

7-6   Exit Options

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

Save Changes and Exit

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

Discard Changes and Exit

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

Discard Changes

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

Load Optimal Defaults

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

Load Fail-Safe Defaults

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

Notes

Appendix A

BIOS Error Beep Codes

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

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

Fatal errors are those which 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.

A-1   BIOS Error Beep Codes

BIOS Error Beep 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
8 beeps	Display memory read/ write error	Video adapter missing or with faulty memory
1 continuous beep (with the front panel OH LED on)	System Overheat	1 continuous beep with the front panel OH LED on

Notes

Appendix B

System Specifications

Note: unless noted specifications apply to a complete system (all serverboards).

Processors

Eight AMD Opteron 2000 series processors (Socket F type) (both CPUs must be of the same type)

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

Chipset

nVidia MCP55 Pro Chipset

BIOS

8 Mb AMI® LPC Flash ROM (each serverboard)

Memory Capacity

Thirty-two dual channel DIMM slots supporting up to 256 GB of DDR2-800/667/533 registered ECC SDRAM

Note: Interleaved memory - requires memory must be installed four modules at a time. See Section 5-6 for details.

SATA Controller

On-chip (MCP55 Pro) SATA controller supporting four (4) SATA ports (RAID 0, 1, 0+1, 5 and JBOD supported) (each serverboard)

Drive Bays

Twelve hot-swap drive bays to house twelve SATA drives (3 for each node)

Expansion Slots

Total of four PCI-Express x16 low-profile slots on serverboards

Serverboard

Four H8DMT-F/H8DMT-IBXF (Extended ATX form factor)
Dimensions: 16.4" x 6.5" (417 x 165 mm)

Chassis

SC827B-R1200B (2U rackmount)
Dimensions: (WxHxD) 17.25 x 3.47 x 28.5 in. (438 x 88 x 724 mm)

Weight

Gross (Bare Bone): 65 lbs. (29.5 kg.)

System Cooling

Four 8-cm PWM system cooling fans

System Input Requirements

AC Input Voltage: 100-240V AC auto-range
Rated Input Current: 13A - 4A
Rated Input Frequency: 50 to 60 Hz
Efficiency: 80+ (Gold Level)

Power Supply

Rated Output Power: 1200W (Part# PWS-1K21P-1R)
Rated Output Voltages: +12V (100A @ 240V, 83A @ 100V), +5Vsb (6A @ 240V, 4A @ 100V)

Operating Environment

Operating Temperature: 0º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 20% to 95% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

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

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

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

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

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