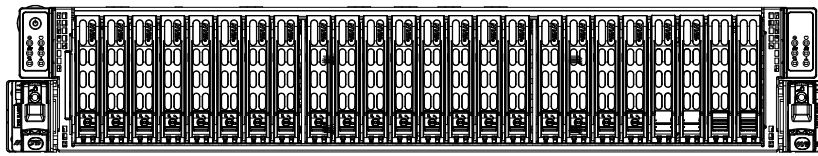
SuperStorageSystem
SSG-2028R-DN2R24L



User's Manual

Revision 1.0

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SSG-2028R-DN2R24L SuperStorageSystem. Installation and maintenance for this system should be performed by experienced technicians only.

The SuperStorageSystem SSG-2028R-DN2R24L is a high-end server based on the SC227TS-R2K05P2 2U rackmount chassis and the dual processor X10DSN-TS serverboard. It has two serverboard nodes, and twenty-four (24) hot-swap 2.5" NVMe drives.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X10DSN-TS serverboard and the SC227TS-R2K05P2 chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperStorageSystem SSG-2028R-DN2R24L into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

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

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SUPERSTORAGESYSTEM SSG-2028R-DN2R24L.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X10DSN-TS serverboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC227TS-R2K05P2 server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring NVMe drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

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

Appendix A: BIOS Error Beep Codes

Appendix B: System Specifications

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Chapter 1

Introduction

1-1 Overview

The SSG-2028R-DN2R24L is a high-end Super Storage Bridge Bay (SBB) system comprises the SC227TS-R2K05P2 chassis, its components and the X10DSN-TS serverboard in each of its two nodes.

In addition to the chassis, various hardware components have been included with the SSG-2028R-DN2R24L, as listed below. Quantities indicate the number included in the whole system.

- Four (4) 1U passive CPU heatsinks (SNK-P0047PS)
- Five (5) 8-cm midplane cooling fans (FAN-0168L4)
- Four (4) 4-cm node counter-rotating fans (FAN-0167L4)
- NVMe Accessories:
  - One (1) Midplane for power distribution and PCI-E pass-through (BPN-NVME3-227SSB)
  - One (1) NVMe base board (BPN-NVME3-227NB)
  - Two (2) NVMe Microsemi PCI-E switch daughter boards (BPN-NVMe3-227NL)
  - Twenty-four (24) 2.5" NVMe HDD carriers (MCP-220-00121-0B)
  - Eight (8) 65-cm 34AWG OCuLink PCIe NVMe SSD cables (CBL-SAST-0819)
- Two (2) 1U storage riser cards (RSC-X-68-C)
- One (1) set of auto-latch rail set hardware (MCP-290-00138-0N)

Note: For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your server.

- Supermicro product manuals: http://www.supermicro.com/support/manuals/
- Product drivers and utilities: ftp://ftp.supermicro.com
- Product safety info: http://www.supermicro.com/about/policies/safety_information.cfm
- If you have any questions, please contact our support team at: Support@supermicro.com

1-2 Motherboard Features

At the heart of the SuperStorageSystem SSG-2028R-DN2R24L is the X10DSN-TS, a dual processor motherboard based on the C612 chipset. Below are the main features of the system (See Figure 1-1 for a block diagram of the motherboard).

Processors

At the heart of the SuperStorageSystem SSG-2028R-DN2R24L is the X10DSN-TS, a dual processor motherboard based on the C612 chipset. Below are the main features of the system (See Figure 1-1 for a block diagram of the motherboard).

Processors

The motherboard supports dual E5-2600 v3/v4 series processors in two Socket R3-LGA 2011 sockets. Please refer to the motherboard description pages on the Supermicro web site for a complete listing of supported processors (www.supermicro.com).

Memory

The motherboard has sixteen (16) DIMM slots that can support up to 1 TB RDIMM or 2 TB 3DS LRDIMM of DDR4 (288-pin) ECC 2400/2133/1866/1600 MHz speed memory at 1.2v voltage. Modules of the same size and speed are recommended. DIMM sizes of 4 GB, 8 GB, 16 GB, 32 GB, 64 GB, 128 GB (3DS LRDIMM only) size are supported See Chapter 5 for details.

Serial ATA

Two (2) SATA 3.0 connectors that support Super DOMs (with power pins built-in) (S-SATA 0/1). The system supports RAID 0, 1, 5 and 10. **Note:** The operating system you use must have RAID support to enable the hot-swap capability and RAID function.

PCI Expansion Slots

The motherboard has the following PCI-E slots available on the serverboard:

- One (1) PCI-Express 3.0 x16 low-profile slots
- One (1) PCI-Express 3.0 x8 low-profile slots
- One (1) SIOM slot

I/O Ports

The rear I/O LAN ports include: one Intel X540 10-Gigabit Ethernet Dual-Channel Controller for 10G-LAN (TLAN) 1/10G-LAN (TLAN) and one IPMI-dedicated LAN supported by the ASpeed AST2400 BMC

Two (2) USB 3.0 ports on the rear I/O panel (USB 0/1) and one (1) Type A USB 3.0 connector for front access (USB 2) are provided. Additionally, one (1) VGA connector and one (1) serial header on the serverboard are available.

Graphics Controller

The X10DSN-TS features an integrated ASpeed 2400 BMC Video Controller.

Notes:

Note 1: The CPU maximum thermal design power (TDP) is subject to chassis and heatsink cooling restrictions. For proper thermal management, please check the chassis and heatsink specifications for proper CPU TDP sizing.

Note 2: For IPMI configuration instructions, please refer to the Embedded IPMI Configuration User's Guide available at http://www.supermicro.com/support/manuals/.

Note 3: It is strongly recommended that you change BMC log-in information upon initial system power-on. The manufacture default username is ADMIN and the password is ADMIN. For proper BMC configuration, please refer to http://www.supermicro.com/products/info/files/IPMI/Best_Practices_BMC_Security.pdf.

1-3 Server Chassis Features

System Power

The SSG-2028R-DN2R24L SuperStorageSystem features a redundant Titanium Level 2000 Watt power supply composed of two separate power modules. This power redundancy feature allows you to replace a failed power module without shutting down the system.

NVMe Subsystem

The SSG-2028R-DN2R24L SuperStorageSystem supports up to twenty-four 2.5" dual port NVMe drives. These drives are hot-swappable units and are connected to a backplane that provides power and control.

Front Control Panel

Two control panels are included on each end of the SSG-2028R-DN2R24L SuperStorageSystem to provide you with system monitoring and control. LEDs indicate system power, network (NIC) activity, system overheat and power supply failure. Each set of LEDs are associated with the node/serverboard on the same side of the chassis. A single power button is located on the left side control panel. When pressed, both nodes will power on or off according to the BIOS setup settings.

Cooling System

The SC227TS-R2K05P2 chassis has five (5) 8-cm behind the HDD backplane and two (2) 4-cm counter-rotating fans at the rear of each node. This counter-rotating action works to dampen vibration levels while generating exceptional airflow.

Each power supply module also includes a cooling fan.

Mounting Rails

The SC227 includes a set of 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 in Chapter 2.

1-4 ACPI Features

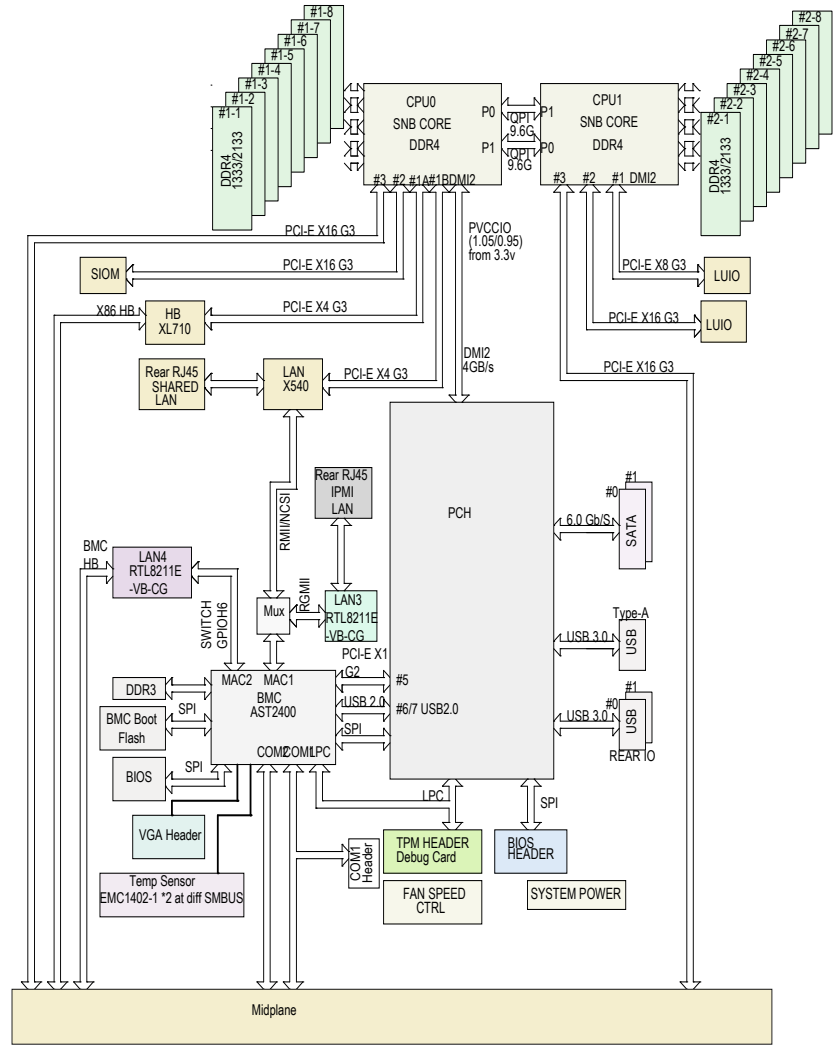
Intel® Intelligent Power Node Manager (NM)

The Intel® Intelligent Power Node Manager (IPNM) provides your system with real-time thermal control and power management for maximum energy efficiency. Although IPNM Specification Version 1.5 is supported by the BMC (Baseboard Management Controller), your system must also have IPNM-Compatible Manageability Engine (ME) firmware installed to use this feature.

Manageability Engine (ME)

The Manageability Engine, which is an ARC controller embedded in the IOH (I/O Hub), provides Server Platform Services (SPS) to your system. The services provided by SPS are different from those provided by the ME on client platforms.

Figure 1-1. C612 Chipset Block Diagram



Notes:

Note 1: This is a general block diagram and may not exactly represent the features on your motherboard. See the Motherboard Features pages for the actual specifications of each motherboard.

Note 2: Both CPUs need to be installed for full access to the PCI-E slots, DIMM slots, and onboard controllers. Refer to the block diagram above to determine which slots or devices may be affected.

1-5 Contacting Supermicro

Headquarters

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980 Rock Ave.
San Jose, CA 95131 U.S.A.
Tel: +1 (408) 503-8000
Fax: +1 (408) 503-8008
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Fax: +886-(2) 8226-3992
Email: support@supermicro.com.tw
Website: www.supermicro.com.tw

1-6 System Notes

The SSG-2028R-DN2R24L Super SBB was designed to function as a fully redundant, fault-tolerant "cluster-in-a-box" system with hot-swappable nodes for all active components.

Nodes

The SSG-2028R-DN2R24L features a dedicated B2B connection using an Intel XL710 private LAN connecting the bottom server module with the top server module. This connection is used for high speed data transfers between nodes for High Availability/server fail-over. This fail-over capability is fully dependent on the software/OS installed and how the chosen software uses the connection (Active-Active or Active-Passive). The SSG-2028R-DN2R24L hardware is supplied without a storage OS or fail-over software.

Equipped with 2000 Watt 80+ Titanium Level redundant power supplies and redundant cooling fans, the SSG-2028R-DN2R24L offers fully redundant, high availability while maintaining energy efficient operation.

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.

System Power

Dual 2000 Watt power supplies are used to provide the power for all serverboards. Each serverboard however, can be shut down independently of the other with the power button on its own control panel.

NVMe Backplane/Drives

As a system, the SuperStorageSystem SSG-2028R-DN2R24L supports the use of twenty-four (24) 2.5" NVMe drives. The NVMe backplane works to apply system-based control for power and fan speed functions. See the Drive Bay Installation/Removal section in Chapter 6 for the logical hard drive and node configuration.

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SSG-2028R-DN2R24L 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., then 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 SSG-2028R-DN2R24L 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 SSG-2028R-DN2R24L. 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 SSG-2028R-DN2R24L was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.
- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).
- This product is not suitable for use with visual display work place devices according to §2 of the German Ordinance for Work with Visual Display Units.

2-4 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.).

Warning! To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

2-5 Installing the System into a Rack

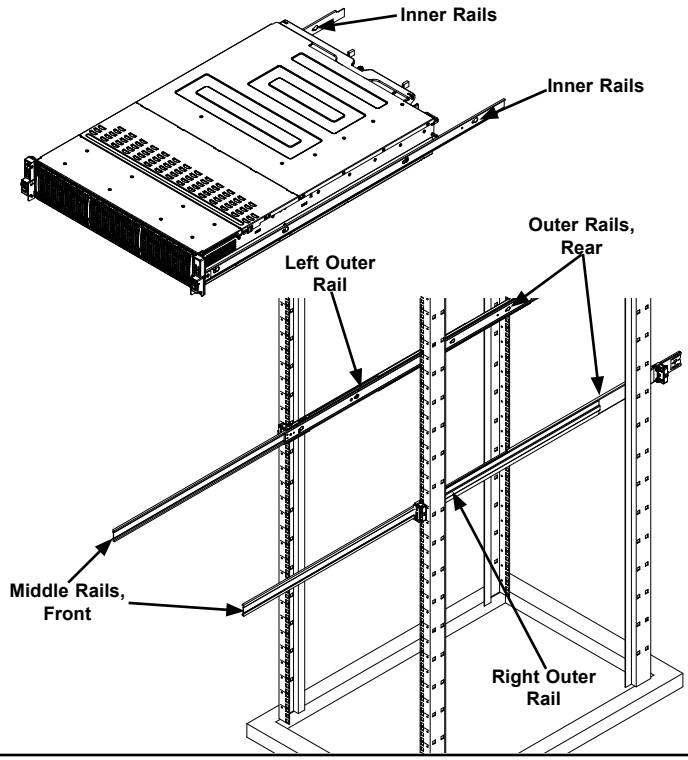
This section provides information on installing the SC227 chassis into a rack unit with the quick-release rails provided. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

Note: This rail will fit a rack between 26.5" and 36.4" deep.

Identifying the Sections of the Rack Rails

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

Figure 2-1. Identifying the Inner Rails, Middle Rails and Outer Rails



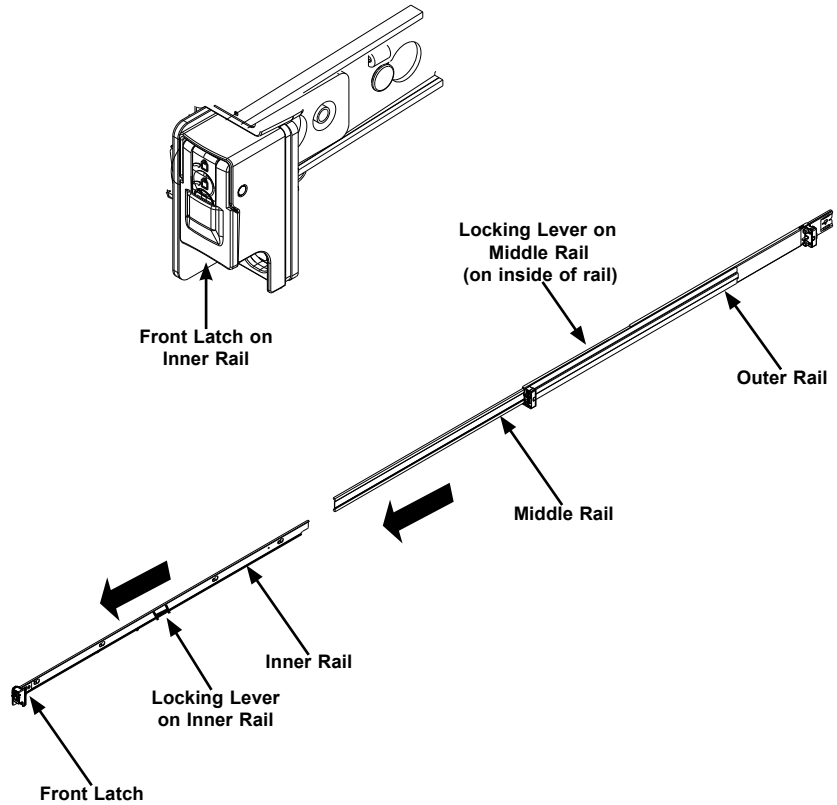
Releasing the Inner Rail

It is necessary to release the inner rail from the middle and outer rails before installing the inner rail on the chassis.

Releasing the Inner Rail from the Middle and Outer Rails

1. Lift the front latch on the inner rail and pull the inner rail out of the middle rail, and the middle rail out of the outer rail until the rails are fully extended.
2. Press down the locking lever on the inside of the inner rail to release the inner rail. Continue to pull the inner rail out of the middle rail.

Figure 2-2. Extending the Rails and Releasing the Inner Rail

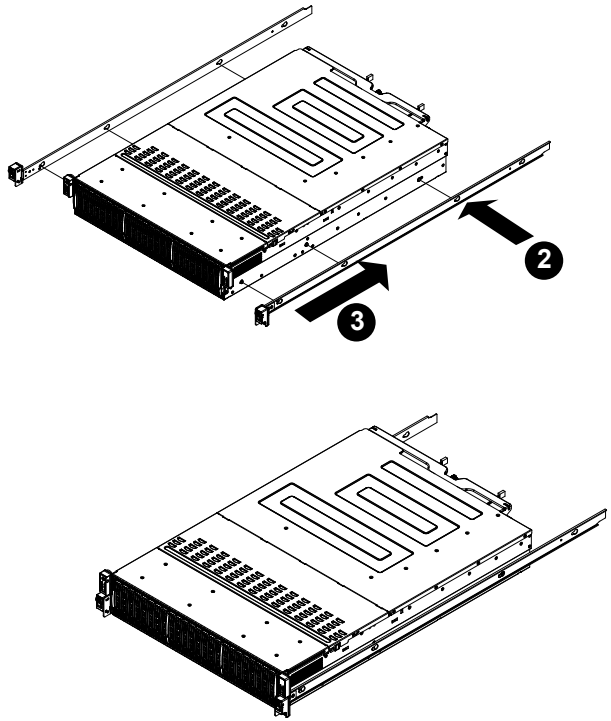


Installing The Inner Rails on the Chassis

Installing the Inner Rails

1. Confirm that the left and right inner rails have been correctly identified.
2. Place the inner rail firmly against the side of the chassis, aligning the pins on the side of the chassis with the slotted thru holes in the inner rail.
3. Slide the inner rail toward the rear of the chassis until the pins are at the end of the narrow slot, which secures the inner rail to the chassis. An optional screw may be added for extra security.
4. Repeat for the other inner rail.

Figure 2-3. Installing the Inner Rails



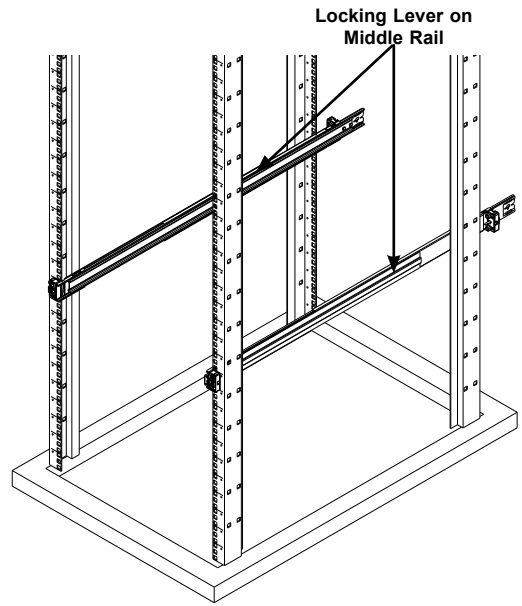
Warning: Do not pick up the server with the front handles. They are designed to pull the system from a rack only.

Installing the Outer Rails on the Rack

Installing the Outer Rails

1. Confirm that the left and right outer rails have been correctly identified.
2. Release the small locking lever on the inside of the middle rail and push the middle rail back into the outer rail.
3. Insert the square pins at the front of the outer rail into the square holes on the front of the rack. Push until the latch snaps into place.
4. The outer rail is actually two pieces that slide to lengthen. Pull out the rear of the outer rail, adjusting the length until the square pin assembly passes, then fits against the back of the rear post. Be careful to keep the rail level.
5. Insert the square pins at the rear of the outer rail into the square holes on the rear of the rack. Push until the latch snaps into place.
6. Repeat for the other outer rail.

Figure 2-4. Installing the Outer Rails



Stability Hazard: The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.

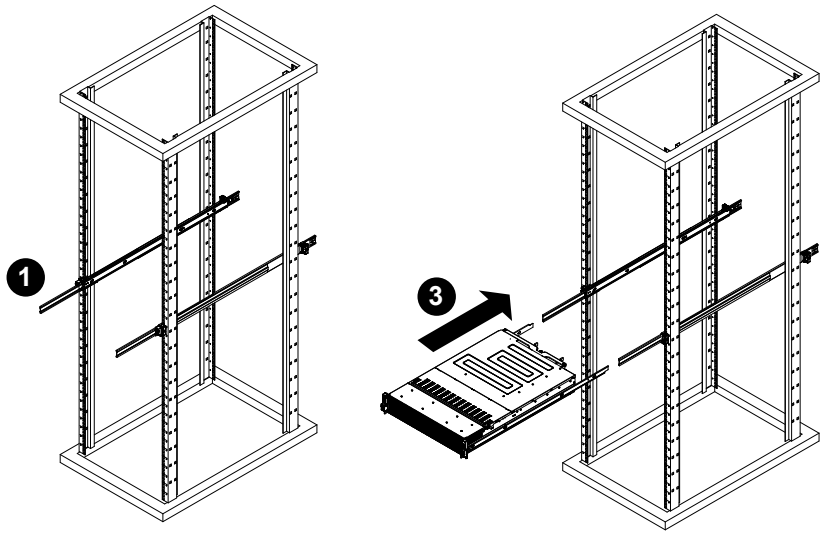
Installing into the Rack

After the rails are installed on the chassis and on the rack, the server can be installed in the rack. It is heavy and requires two to three people to lift.

Installing the Chassis into a Rack

1. Pull both middle rails out the front of the outer rail until each clicks to a stop.
2. Align the inner rails on the chassis with the front of the middle rails.
3. Slide the inner rails on the chassis into the middle rails, keeping the pressure even on both sides. When partially in, the locking levers will stop further progress.
4. Press down the locking levers on the inside of the inner rails and push the chassis all the way into the rear of the rack. The front latches will click into place.

Figure 2-5. Installing the Chassis into the Rack



Note: Figures are for illustrative purposes only. Your actual chassis may differ. Always install servers into racks from the bottom up.

The server is now mounted in the rack. It can be pulled partially out for service by lifting both front latches.

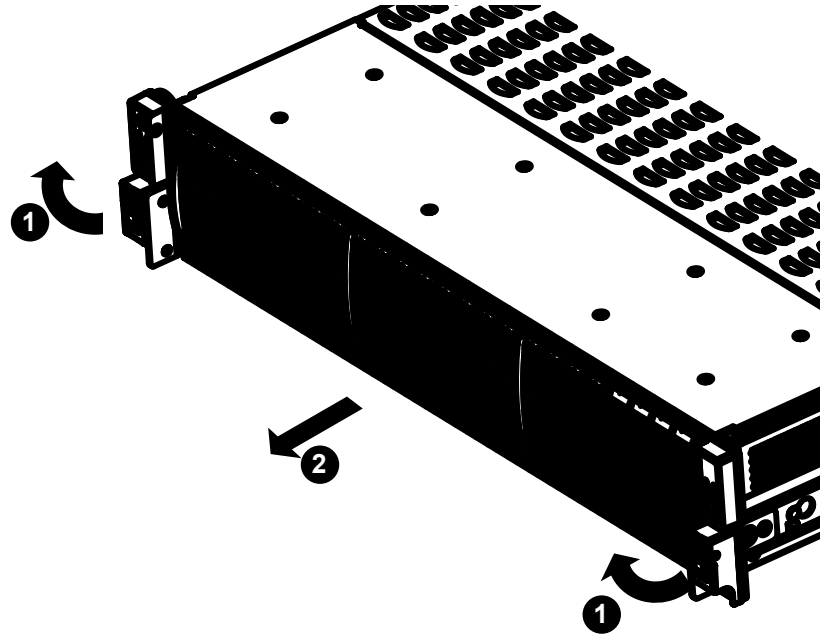
Removing the Chassis From the Rack

Caution: The server is heavy and requires two to three people to lift it out.

Removing the Chassis

1. Lift the right and left front latches which are just below the LED control panels on the front edges of the chassis.
2. Pull the chassis forward until it clicks to a stop.
3. Press down the locking lever on the inside of the inner rail (Figure 2-2) to release the server. Continue to pull the server out of the middle rails.

Figure 2-6. Removing the Chassis



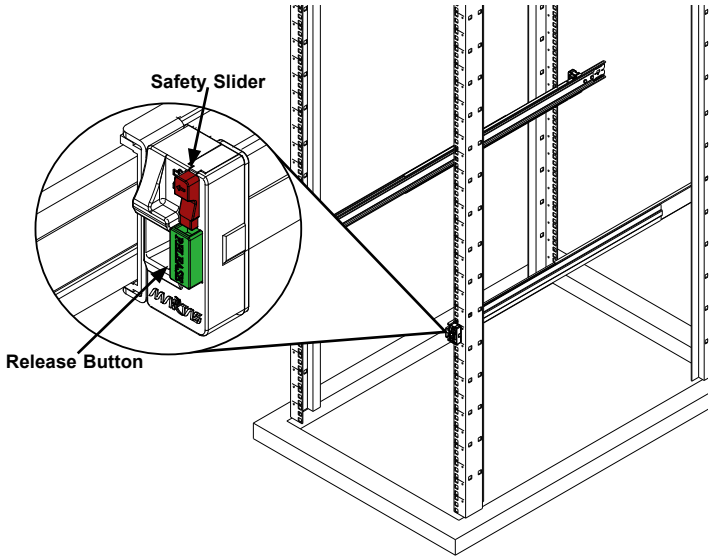
Removing the Outer Rails From the Rack

In the uncommon event that it is necessary to remove the outer rails from the rack, follow these instructions. The chassis must be out of the rack.

Releasing the Outer Rails

1. On the front of the outer rail, slide the small plastic safety slider (red in drawing) up and hold it while pushing the plastic release button (green in drawing) just below it.
2. While holding the release button in, pull the outer rail forward to disengage the pins and the front of the rail from the rack.
3. Support the front of the outer and middle rail assembly while releasing the rear.
4. Remove the outer rail from the rear of the rack in the same way as the front. Slide the safety slider up and push and hold the release button, then pull the rear pins out of the rack and remove the rail.

Figure 2-7. Removing the Outer Rails



Note: A small number of customers may have received a different outer rail than the one pictured. This rail features side release latch on the front of the outer rail, which opens inward to release the outer rail from the rack. Contact Supermicro's Technical Support department if you need additional assistance.

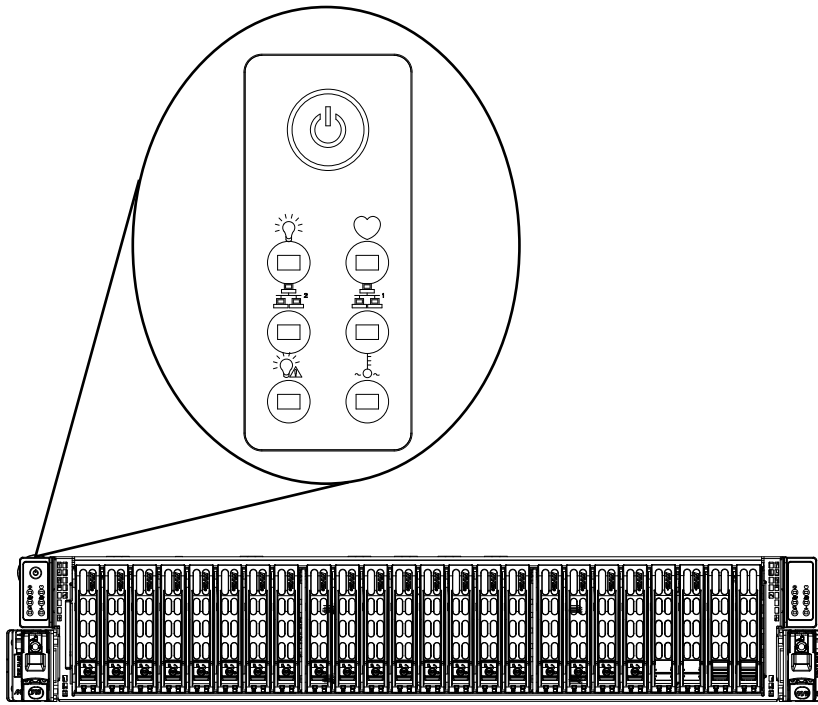
Chapter 3

System Interface

3-1 Overview

There are several LEDs on two control panels as well as others on the drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. A main power button is also located on the right side (only) control panel.

Figure 3-1. Control Panel



3-2 Control Panel Button

Power

The single button located on the right control panel is the power on/off button. Depressing this button will either power both nodes on or off. Turning off the system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The two control panels located on the front of the chassis have several LEDs. With the exception of the power fail LED, these LEDs provide you with critical information related to the node on the same side of the chassis. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

Power

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

Heartbeat

On the SSG-2028R-DN2R24L, this is a serverboard heartbeat LED and indicates that power is being supplied to the serverboard.

NIC1

Indicates network activity on the LAN1 port when flashing.

NIC2

Indicates network activity on the LAN2 port when flashing.

Power Fail

Indicates a power supply module has failed. The second power supply module will take the load and keep the system running but the failed module will need to be replaced. Refer to Chapter 6 for details on replacing the power supply. This LED should be off when the system is operating normally.

Overheat/Fan Fail:

When this LED flashes, it indicates a fan failure. When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists.

3-4 Drive Carrier LEDs

The chassis includes externally accessible NVMe drives. Each drive carrier displays two status LEDs on the front of the carrier.

	LED Color	State	Status
Activity LED	Blue	Solid On	NVMe drive installed
	Blue	Blinking	I/O activity
Status LED	Red	Solid On	Failed drive for NVMe with RSTe support
	Red	Blinking at 1 Hz	Rebuild drive for NVMe with RSTe support
	Red	Blinking with two blinks and one stop at 1 Hz	Hot spare for NVMe with RSTe support
	Red	On for five seconds, then off	Power on for NVMe with RSTe support
	Red	Blinking at 4 Hz	Identify drive for NVMe with RSTe support
	Green	Solid On	Safe to remove NVMe device
	Amber	Blinking at 1 Hz	Attention state—do not remove NVMe device

Chapter 4

Standardized Warning Statements for AC Systems

4-1 About Standardized Warning Statements

The following statements are industry standard warnings, provided to warn the user of situations which have the potential for bodily injury. Should you have questions or experience difficulty, contact Supermicro's Technical Support department for assistance. Only certified technicians should attempt to install or configure components.

Read this appendix in its entirety before installing or configuring components in the Supermicro chassis.

These warnings may also be found on our web site at http://www.supermicro.com/about/policies/safety_information.cfm.

Warning Definition

Warning!

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

警告の定義

この警告サインは危険を意味します。

人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、

電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危险。

您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾的声明号码找到此设备的安全性警告说明的翻译文本。

此警告符號代表危險。

您正處於可能身體可能會受損傷的工作環境中。在您使用任何設備之前，請注意觸電的危險，並且要熟悉預防事故發生的標準工作程序。請依照每一注意事項後的號碼找到相關的翻譯說明內容。

Warnung

WICHTIGE SICHERHEITSHINWEISE

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES.

IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS.

תקנון הצהרות אזהרה

הצהרות הבאות הן אזהרות על פי תקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בבעיה כלשהי, יש ליצור קשר עם מחלקת תמיכה טכנית של סופרמיקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים.

יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במארזי סופרמיקרו.

تحذير! هذا الرمز يعني خطر انك في حالة يمكن أن تتسبب في اصابة جسدية .
قبل أن تعمل على أي معدات،كن على علم بالمخاطر الناجمة عن الدوائر الكهربائية
وكن على دراية بالممارسات الوقائية لمنع وقوع أي حوادث
استخدم رقم البيان المنصوص في نهاية كل تحذير للعثور ترجمتها

안전을 위한 주의사항

경고!

이 경고 기호는 위험이 있음을 알려 줍니다. 작업자의 신체에 부상을 야기 할 수 있는 상태에 있게 됩니다. 모든 장비에 대한 작업을 수행하기 전에 전기회로와 관련된 위험요소들을 확인하시고 사전에 사고를 방지할 수 있도록 표준 작업절차를 준수해 주시기 바랍니다.

해당 번역문을 찾기 위해 각 경고의 마지막 부분에 제공된 경고문 번호를 참조하십시오

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwings symbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij een elektrische installatie betrokken risico's en dient u op de hoogte te zijn van de standaard procedures om ongelukken te voorkomen. Gebruik de nummers aan het eind van elke waarschuwing om deze te herleiden naar de desbetreffende locatie.

BEWAAR DEZE INSTRUCTIES

Installation Instructions

Warning!

Read the installation instructions before connecting the system to the power source.

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告
将此系统连接电源前,请先阅读安装说明。

警告
將系統與電源連接前，請先閱讀安裝說明。

Warnung

Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.

¡Advertencia!

Lea las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Attention

Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقر إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

Waarschuwing

Raadpleeg de installatie-instructies voordat u het systeem op de voedingsbron aansluit.

Circuit Breaker

Warning!

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 20 A.

サーキット・ブレーカー

この製品は、短絡(過電流)保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

警告
此产品的短路(过载电流)保护由建筑物的供电系统提供,确保短路保护设备的额定电流不大于250V,20A。

警告
此產品的短路(過載電流)保護由建築物的供電系統提供,確保短路保護設備的額定電流不大於250V,20A。

Warnung

Dieses Produkt ist darauf angewiesen, dass im Gebäude ein Kurzschluss- bzw. Überstromschutz installiert ist. Stellen Sie sicher, dass der Nennwert der Schutzvorrichtung nicht mehr als: 250 V, 20 A beträgt.

¡Advertencia!

Este equipo utiliza el sistema de protección contra cortocircuitos (o sobrecorrientes) del edificio. Asegúrese de que el dispositivo de protección no sea superior a: 250 V, 20 A.

Attention

Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifiez que le courant nominal du dispositif de protection n'est pas supérieur à :250 V, 20 A.

מוצר זה מסתמך על הגנה המותקנת במבנים למניעת קצר חשמלי. יש לוודא המכשיר המגן מפני הקצר החשמלי הוא לא יותר מ-60VDC, 20A

هذا المنتج يعتمد على معداث الحمايت مه الدوائرالقصيرة التي تم تثبيتها ف المبنى

تأكد من أن تقييم الجهاز الوقائي ليس أكثر من: 20A, 250VDC

경고!

이 제품은 전원의 단락(과전류)방지에 대해서 전적으로 건물의 관련 설비에 의존합니다. 보호장치의 정격이 반드시 250V(볼트), 20A(암페어)를 초과하지 않도록 해야 합니다.

Waarschuwing

Dit product is afhankelijk van de kortsluitbeveiliging (overspanning) van uw electrische installatie. Controleer of het beveiligde aparaat niet groter gedimensioneerd is dan 220V, 20A.

Power Disconnection Warning

Warning!

The system must be disconnected from all sources of power and the power cord removed from the power supply module(s) before accessing the chassis interior to install or remove system components.

電源切断の警告

システムコンポーネントの取り付けまたは取り外しのために、シャーシー内部にアクセスするには、
システムの電源はすべてのソースから切断され、電源コードは電源モジュールから取り外す必要があります。

警告

在你打开机箱并安装或移除内部器件前,必须将系统完全断电,并移除电源线。

警告

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

Warnung

Das System muss von allen Quellen der Energie und vom Netzanschlusskabel getrennt sein, das von den Spg.Versorgungsteilmodulen entfernt wird, bevor es auf den Chassisinnenraum zurückgreift, um Systemsbestandteile anzubringen oder zu entfernen.

¡Advertencia!

El sistema debe ser disconnected de todas las fuentes de energía y del cable eléctrico quitado de los módulos de fuente de alimentación antes de tener acceso el interior del chasis para instalar o para quitar componentes de sistema.

Attention

Le système doit être débranché de toutes les sources de puissance ainsi que de son cordon d'alimentation secteur avant d'accéder à l'intérieur du chassis pour installer ou enlever des composants de systéme.

אזהרה !

יש לנתק את המערכת מכל מקורות החשמל ויש להסיר את כבל החשמלי מהספק לפני גישה לחלק הפנימי של המארז לצורך התקנת או הסרת רכיבים.

يجب فصل النظام من جميع مصادر الطاقة وإزالة سلك الكهرباء من وحدة امداد الطاقة قبل
الوصول إلى المناطق الداخلية للهيكل لتثبيت أو إزالة مكونات الجهاز

경고!

시스템에 부품들을 장착하거나 제거하기 위해서는 섀시 내부에 접근하기 전에 반드시 전원 공급장치로부터 연결되어있는 모든 전원과 전기코드를 분리해주어야 합니다.

Waarschuwing

Voordat u toegang neemt tot het binnenwerk van de behuizing voor het installeren of verwijderen van systeem onderdelen, dient u alle spanningsbronnen en alle stroomkabels aangesloten op de voeding(en) van de behuizing te verwijderen

Equipment Installation

Warning!

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

機器の設置

トレーニングを受け認定された人だけがこの装置の設置、交換、またはサービスを許可されています。

警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

Warnung

Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden.

¡Advertencia!

Solamente el personal calificado debe instalar, reemplazar o utilizar este equipo.

Attention

Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés.

אזהרה !

צוות מוסמך בלבד רשאי להתקין, להחליף את הציוד או לתת שירות עבור הציוד.

يجب أن يسمح فقط للموظفين المؤهلين والمدربين لتركيب واستبدال أو خدمة هذا الجهاز

경고!

훈련을 받고 공인된 기술자만이 이 장비의 설치, 교체 또는 서비스를 수행할 수 있습니다.

Waarschuwing

Deze apparatuur mag alleen worden geïnstalleerd, vervangen of hersteld door geschoold en gekwalificeerd personeel.

Restricted Area

Warning!

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. (This warning does not apply to workstations).

アクセス制限区域

このユニットは、アクセス制限区域に設置されることを想定しています。

アクセス制限区域は、特別なツール、鍵と錠前、その他のセキュリティの手段を用いてのみ出入りが可能です。

警告

此部件应安装在限制进出的场所，限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全手段进出的场所。

警告

此裝置僅限安裝於進出管制區域，進出管制區域係指僅能以特殊工具、鎖頭及鑰匙或其他安全方式才能進入的區域。

Warnung

Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Der Zutritt zu derartigen Bereichen ist nur mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer sonstigen Sicherheitsvorkehrung möglich.

¡Advertencia!

Esta unidad ha sido diseñada para instalación en áreas de acceso restringido. Sólo puede obtenerse acceso a una de estas áreas mediante la utilización de una herramienta especial, cerradura con llave u otro medio de seguridad.

Attention

Cet appareil doit être installée dans des zones d'accès réservés. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.

אזור עם גישה מוגבלת

אזהרה !
יש להתקין את היחידה באזורים שיש בהם הגבלת גישה. הגישה ניתנת בעזרת כלי אבטחה בלבד (מפתח, מנעול וכד').

تم تخصيص هذه الوحدة لتركيبها في مناطق محظورة .
يمكن الوصول إلى منطقة محظورة فقط من خلال استخدام أداة خاصة،
قفل ومفتاح أو أي وسيلة أخرى للالأمان

경고!

이 장치는 접근이 제한된 구역에 설치하도록 되어있습니다. 특수도구, 잠금 장치 및 키, 또는 기타 보안 수단을 통해서만 접근 제한 구역에 들어갈 수 있습니다.

Waarschuwing

Dit apparaat is bedoeld voor installatie in gebieden met een beperkte toegang. Toegang tot dergelijke gebieden kunnen alleen verkregen worden door gebruik te maken van speciaal gereedschap, slot en sleutel of andere veiligheidsmaatregelen.

Battery Handling

Warning!

There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions

電池の取り扱い

電池交換が正しく行われなかった場合、破裂の危険性があります。交換する電池はメーカーが推奨する型、または同等のものを使用下さい。使用済電池は製造元の指示に従って処分して下さい。

警告
电池更换不当会有爆炸危险。请只使用同类电池或制造商推荐的功能相当的电池更换原有电池。请按制造商的说明处理废旧电池。

警告
電池更換不當會有爆炸危險。請使用製造商建議之相同或功能相當的電池更換原有電池。請按照製造商的說明指示處理廢棄舊電池。

Warnung

Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

Attention

Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

¡Advertencia!

Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

אזהרה !
קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة استبدال البطارية بطريقة غير صحيحة فعليك
استبدال البطارية
فقط بنفس النوع أو ما يعادلها كما أوصت به الشركة المصنعة
تخلص من البطاريات المستعملة وفقا لتعليمات الشركة الصانعة

경고!

배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

Waarschuwing

Er is ontploffingsgevaar indien de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type die door de fabrikant aanbevolen wordt. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften afgevoerd te worden.

Redundant Power Supplies

Warning!

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.

冗長電源装置

このユニットは複数の電源装置が接続されている場合があります。

ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

警告

此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。

警告

此裝置連接的電源可能不只一個，必須切斷所有電源才能停止對該裝置的供電。

Warnung

Dieses Gerät kann mehr als eine Stromzufuhr haben. Um sicherzustellen, dass der Einheit kein trom zugeführt wird, müssen alle Verbindungen entfernt werden.

¡Advertencia!

Puede que esta unidad tenga más de una conexión para fuentes de alimentación. Para cortar por completo el suministro de energía, deben desconectarse todas las conexiones.

Attention

Cette unité peut avoir plus d'une connexion d'alimentation. Pour supprimer toute tension et tout courant électrique de l'unité, toutes les connexions d'alimentation doivent être débranchées.

אם קיים יותר מספק אחד

אזהרה !

ליחדה יש יותר מחיבור אחד של ספק. יש להסיר את כל החיבורים על מנת לרוקן את היחידה.

قد يكون لهذا الجهاز عدة اتصالات بوحدات امداد الطاقة.
يجب إزالة كافة الاتصالات لعزل الوحدة عن الكهرباء

경고!

이 장치에는 한 개 이상의 전원 공급 단자가 연결되어 있을 수 있습니다. 이 장치에 전원을 차단하기 위해서는 모든 연결 단자를 제거해야만 합니다.

Waarschuwing

Deze eenheid kan meer dan één stroomtoevoeraansluiting bevatten. Alle aansluitingen dienen verwijderd te worden om het apparaat stroomloos te maken.

Backplane Voltage

Warning!

Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.

バックプレーンの電圧

システムの稼働中は危険な電圧または電力が、バックプレーン上にかかっています。

修理する際には注意ください。

警告

当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

警告

當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

Wenn das System in Betrieb ist, treten auf der Rückwandplatine gefährliche Spannungen oder Energien auf. Vorsicht bei der Wartung.

¡Advertencia!

Cuando el sistema está en funcionamiento, el voltaje del plano trasero es peligroso. Tenga cuidado cuando lo revise.

Attention

Lorsque le système est en fonctionnement, des tensions électriques circulent sur le fond de panier. Prendre des précautions lors de la maintenance.

מתח בפנל האחורי

אזהרה !
קיימת סכנת מתח בפנל האחורי בזמן תפעול המערכת. יש להיזהר במהלך העבודה.

هناك خطر من التيار الكهربائي أوالطاقة الموجودة على اللوحة
عندما يكون النظام يعمل كن حذرا عند خدمة هذا الجهاز

경고!

시스템이 동작 중일 때 후면판 (Backplane)에는 위험한 전압이나 에너지가 발생합니다. 서비스 작업 시 주의하십시오.

Waarschuwing

Een gevaarlijke spanning of energie is aanwezig op de backplane wanneer het systeem in gebruik is. Voorzichtigheid is geboden tijdens het onderhoud.

Comply with Local and National Electrical Codes

Warning!

Installation of the equipment must comply with local and national electrical codes.

地方および国の電気規格に準拠
機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告

设备安装必须符合本地与本国电气法规。

警告

設備安裝必須符合本地與本國電氣法規。

Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!

La instalacion del equipo debe cumplir con las normas de electricidad locales y nacionales.

Attention

L'équipement doit être installé conformément aux normes électriques nationales et locales.

תיאום חוקי החשמל הארצי

אזהרה !
התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمتثل للقوانين المحلية والوطنية المتعلقة بالكهرباء

경고!

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

Waarschuwing

Bij installatie van de apparatuur moet worden voldaan aan de lokale en nationale elektriciteitsvoorschriften.

Product Disposal

Warning!

Ultimate disposal of this product should be handled according to all national laws and regulations.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!

Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

סילוק המוצר

אזהרה !
סילוק סופי של מוצר זה חייב להיות בהתאם להנחיות וחוקי המדינה.

عند التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين واللوائح الوطنية

경고!

이 제품은 해당 국가의 관련 법규 및 규정에 따라 폐기되어야 합니다.

Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

Hot Swap Fan Warning

Warning!

Hazardous moving parts. Keep away from moving fan blades. The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

ファン・ホットスワップの警告

警告！回転部品に注意。運転中は回転部(羽根)に触れないでください。シャーシから冷却ファン装置を取り外した際、ファンがまだ回転している可能性があります。ファンの開口部に、指、ドライバー、およびその他のものを近づけないで下さい。

警告!
警告！危险的可移动性零件。请务必与转动的风扇叶片保持距离。 当您从机架移除风扇装置，风扇可能仍在转动。小心不要将手指、螺丝起子和其他物品太靠近风扇

警告
危險的可移動性零件。請務必與轉動的風扇葉片保持距離。 當您從機架移除風扇裝置，風扇可能仍在轉動。小心不要將手指、螺絲起子和其他物品太靠近風扇。

Warnung

Gefährlich Bewegende Teile. Von den bewegenden Lüfterblätter fern halten. Die Lüfter drehen sich u. U. noch, wenn die Lüfterbaugruppe aus dem Chassis genommen wird. Halten Sie Finger, Schraubendreher und andere Gegenstände von den Öffnungen des Lüftergehäuses entfernt.

¡Advertencia!

Riesgo de piezas móviles. Mantener alejado de las aspas del ventilador. Los ventiladores podran dar vuelta cuando usted quite ell montaje del ventilador del chasis. Mandtenga los dedos, los destornilladores y todos los objetos lejos de las aberturas del ventilador

Attention

Pieces mobiles dangereuses. Se tenir a l'ecart des lames du ventilateur Il est possible que les ventilateurs soient toujours en rotation lorsque vous retirerez le bloc ventilateur du châssis. Prenez garde à ce que doigts, tournevis et autres objets soient éloignés du logement du bloc ventilateur.

אזהרה !
כאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאוררים עדיין עובדים. יש להרחיק למרחק בטוח את האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

من الممكن أن المراوح لا تزال تدورعند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع ومفكات البراغي

경고!

움직이는 위험한 부품. 회전하는 송풍 날개에 접근하지 마세요. 섀시로부터 팬 조립품을 제거할 때 팬은 여전히 회전하고 있을 수 있습니다. 팬 조립품 외관의 열려있는 부분들로부터 손가락 및 스크류드라이버, 다른 물체들이 가까이 하지 않도록 배치해 주십시오.

Waarschuwing

Gevaarlijk bewegende onderdelen. Houd voldoende afstand tot de bewegende ventilatorbladen. Het is mogelijk dat de ventilator nog draait tijdens het verwijderen van het ventilatorsamenstel uit het chassis. Houd uw vingers, schroevendraaiers en eventuele andere voorwerpen uit de buurt van de openingen in de ventilatorbehuizing.

Power Cable and AC Adapter

Warning!

When installing the product, use the provided or designated connection cables, power cables and AC adaptors. Using any other cables and adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL or CSA -certified cables (that have UL/CSA shown on the code) for any other electrical devices than products designated by Supermicro only.

電源コードとACアダプター

製品を設置する場合、提供または指定された接続ケーブル、電源コードとACアダプターを使用下さい。他のケーブルやアダプタを使用すると故障や火災の原因になることがあります。電気用品安全法は、ULまたはCSA認定のケーブル(UL/CSEマークがコードに表記)を Supermicroが指定する製品以外に使用することを禁止しています。

警告

安装此产品时,请使用本身提供的或指定的连接线,电源线和电源适配器.使用其它线材或适配器可能会引起故障或火灾。除了Supermicro所指定的产品,电气用品和材料安全法律规定禁止使用未经UL或CSA认证的线材。(线材上会显示UL/CSA符号)。

警告

安裝此產品時,請使用本身提供的或指定的連接線,電源線和電源適配器.使用其它線材或適配器可能會引起故障或火災。除了Supermicro所指定的產品,電氣用品和材料安全法律規定禁止使用未經UL或CSA認證的線材。(線材上會顯示UL/CSA符號)。

Warnung

Bei der Installation des Produkts, die zur Verfügung gestellten oder benannt Anschlusskabel, Stromkabel und Netzteile. Verwendung anderer Kabel und Adapter kann zu einer Fehlfunktion oder ein Brand entstehen. Elektrische Geräte und Material Safety Law verbietet die Verwendung von UL-oder CSA-zertifizierte Kabel, UL oder CSA auf der Code für alle anderen elektrischen Geräte als Produkte von Supermicro nur bezeichnet gezeigt haben.

¡Advertencia!

Al instalar el producto, utilice los cables de conexión previstos o designados, los cables y adaptadores de CA. La utilización de otros cables y adaptadores podría ocasionar un mal funcionamiento o un incendio. Aparatos Eléctricos y la Ley de Seguridad del Material prohíbe el uso de UL o CSA cables certificados que tienen UL o CSA se muestra en el código de otros dispositivos eléctricos que los productos designados por Supermicro solamente.

Attention

Lors de l'installation du produit, utilisez les bables de connection fournis ou désigné. L'utilisation d'autres cables et adaptateurs peut provoquer un dysfonctionnement ou un incendie. Appareils électroménagers et de loi sur la sécurité Matériel interdit l'utilisation de UL ou CSA câbles certifiés qui ont UL ou CSA indiqué sur le code pour tous les autres appareils électriques que les produits désignés par Supermicro seulement.

חשמליים ומתאמי AC

אזהרה !

כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתאמים AC אשר נועדו וסופקו לשם כך. שימוש בכל כבל או מתאם אחר יכול לגרום לתקלה או קצר חשמלי. על פי חוקי שימוש במכשירי חשמל וחוקי בטיחות, קיים איסור להשתמש בכבלים המוסמכים ב- UL או ב- CSA (כשאר מופיע עליהם קוד של UL/CSA) עבור כל מוצר חשמלי אחר שלא צוין על ידי סופרמיקרו בלבד.

عند تركيب الجهاز يجب استخدام كابلات التوصيل،والكابلات الكهربائية ومحولات التيار المتردد
التي . أن استخدام أي كابلات ومحولات أخرى يتسبب في حدوث عطل أو حريق.
تم توفيرها لك مع المنتج
الأجهزة الكهربائية ومواد قانون السلامة يحظر استخدام الكابلات CSA أو UL معتمدة من قبل
لأي أجهزة كهربائية أخرى غير المنتجات المعينة من قبل Supermicro
(التي تحمل علامة UL/CSA)

경고!

제품을 설치할 때에는 제공되거나 지정된 연결케이블과 전원케이블, AC어댑터를 사용해야 합니다. 그 밖의 다른 케이블들이나 어댑터들은 고장 또는 화재의 원인이 될 수 있습니다. 전기용품안전법 (Electrical Appliance and Material Safety Law)은 슈퍼마이크로에서 지정한 제품들 외에는 그 밖의 다른 전기 장치들을 위한 UL또는 CSA에서 인증한 케이블(전선 위에 UL/CSA가 표시)들의 사용을 금지합니다.

Waarschuwing

Bij het installeren van het product, gebruik de meegeleverde of aangewezen kabels, stroomkabels en adapters. Het gebruik van andere kabels en adapters kan leiden tot een storing of een brand. Elektrisch apparaat en veiligheidsinformatiebladen wet verbiedt het gebruik van UL of CSA gecertificeerde kabels die UL of CSA die op de code voor andere elektrische apparaten dan de producten die door Supermicro alleen.

Notes

Chapter 5

Advanced Motherboard Setup

This chapter covers the steps required to install the X10DSN-TS motherboard into the chassis, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the motherboard to better cool and protect the system.

5-1 Handling the Motherboard

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

Precautions

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

Unpacking

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

5-2 Connecting Cables

Now that the processors are installed, the next step is to connect the cables to the serverboard.

Connecting Data Cables

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

5-3 Control Panel Connectors and I/O Ports

The rear I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-1 below for the colors and locations of the various I/O ports.

Figure 5-1. Rear I/O Ports

Back Panel I/O Port Locations and Definitions	
1	LEDL: (Bottom LED) System Heartbeat LED
2	LEDH: (Top LED) BMC Heartbeat LED
3	Back Panel USB 3.0 Port 0
4	Back Panel USB 3.0 Port 1
5	5. IPMI LAN Port
6	LAN (10G_LAN) Port 2
7	LAN (10G_LAN) Port 1

5-4 Processor and Heatsink Installation

Warning: When handling the processor package, avoid placing direct pressure on the label area. Also, improper CPU installation and socket/pin misalignment may cause serious damage to the CPU or the motherboard that will require RMA repairs. Be sure to read and follow all instructions thoroughly before installing your CPU and heatsink.

Notes:

Always connect the power cord last, and always remove it before adding, removing, or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

If you buy a CPU separately, make sure that you use an Intel-certified multidirectional heatsink only.

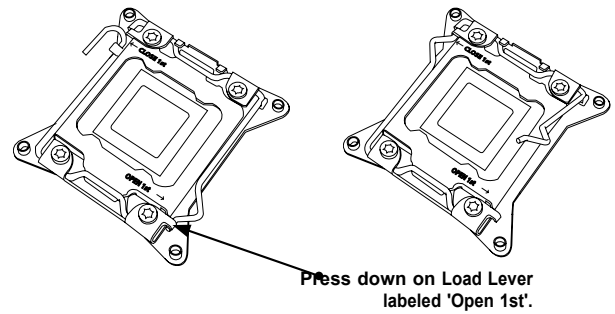
Make sure to install the motherboard into the chassis before you install the CPU heatsink.

If you receive a motherboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and that none of the socket pins are bent; otherwise, contact your retailer immediately.

Refer to the Supermicro website for updates on CPU support.

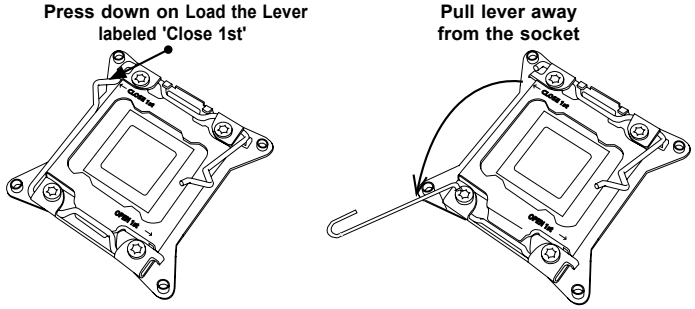
Installing the LGA2011 Processor

1. There are two load levers on the LGA2011 socket. To open the socket cover, first press and release the load lever labeled 'Open 1st'.

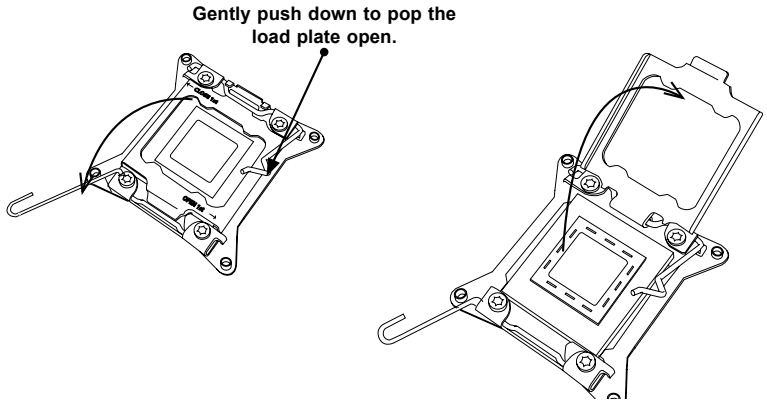


Note: Graphics and drawings shown in this manual are for illustration only. Your components may or may not look the same as the graphics shown in the manual.

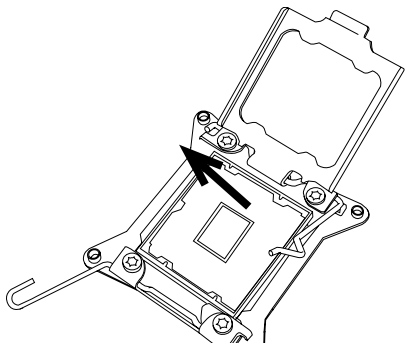
2. Press the second load lever labeled 'Close 1st' to release the load plate that covers the CPU socket from its locking position.



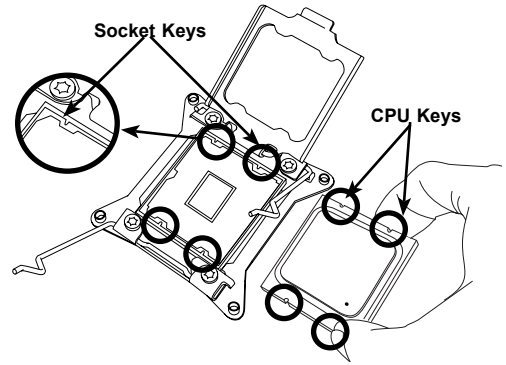
3. With the lever labeled 'Close 1st' fully retracted, gently push down on the 'Open 1st' lever to open the load plate. Lift the load plate to open it completely.



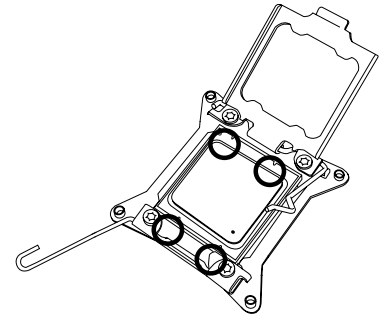
4. Using your thumb and the index finger, remove the 'WARNING' plastic cap from the socket.



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

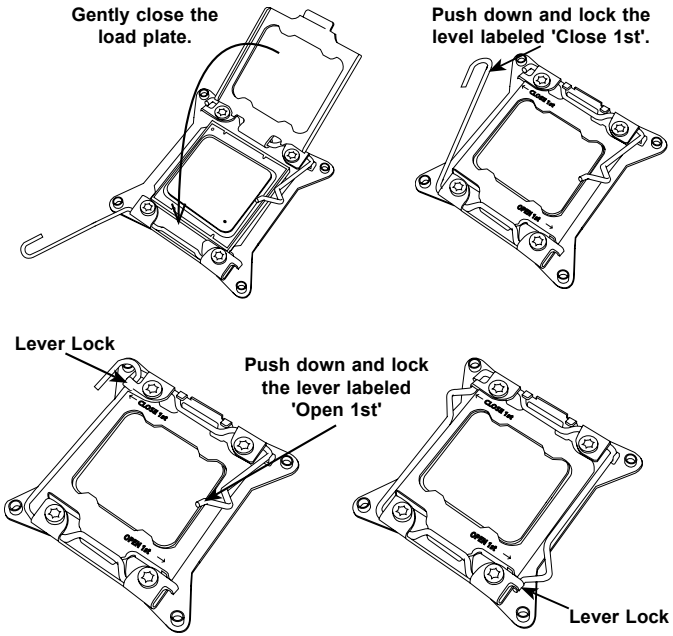


6. Once they are aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface or against any pins of the socket to avoid damaging the CPU or the socket.)



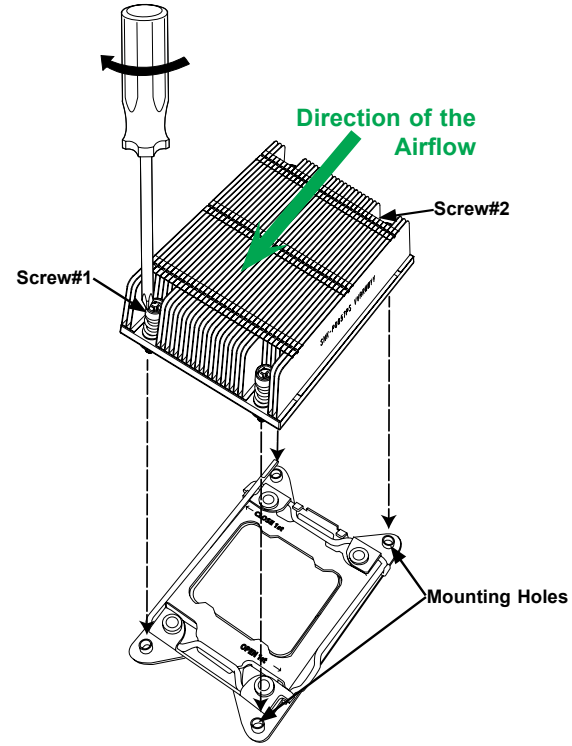
Caution: You can only install the CPU inside the socket in one direction. Make sure that it is properly inserted into the CPU socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU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

7. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.
8. Close the load plate with the CPU inside the socket. Lock the lever labeled 'Close 1st' first, then lock the lever labeled 'Open 1st' second. Use your thumb to gently push the load levers down to the lever locks.



Installing a Passive CPU Heatsink

1. Do not apply any thermal grease to the heatsink or the CPU die -- the required amount has already been applied.
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the motherboard and the heatsink bracket underneath.
3. Screw in two diagonal screws (e.g., the #1 and the #2 screws) until just snug. Do not over-tighten the screws to avoid damaging the CPU and the motherboard.
4. Finish the installation by fully tightening all four screws.

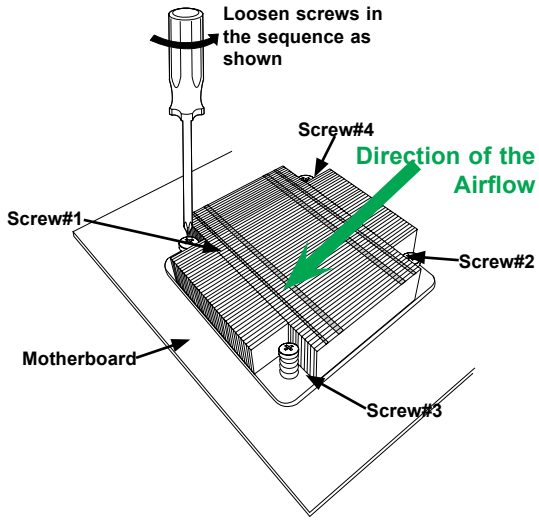


Note: For optimal airflow, please follow your chassis airflow direction to correctly install the CPU heatsink. Graphic drawings included in this manual are for reference only. They might look different from the components installed in your system.

Removing the CPU and the Heatsink

Warning: We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the CPU or the heatsink, please follow the instructions below to uninstall the heatsink or the CPU without damaging the CPU or the motherboard.

1. Unscrew the heatsink screws from the motherboard in the sequence as shown in the illustration below.
2. Gently wriggle the heatsink to loosen it from the CPU socket. Do not use excessive force when loosening the heatsink!
3. Once the heatsink is loosened, remove the it from the socket. Once the heatsink is removed, remove the CPU from the socket as needed.
4. Remove the used thermal grease and clean the surface of the CPU and the heatsink. Reapply the proper amount of thermal grease on the surface before reinstalling the CPU and the heatsink as needed.



Note 1: To optimize airflow, please follow your chassis airflow direction to properly install the heatsink.

Note 2: Graphics shown in this manual are for reference only. They may or may not look the same as the components installed in your system.

5-5 Installing Memory

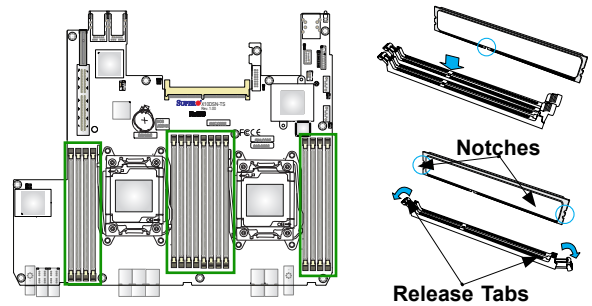
Note: Check Supermicro's website for a list of recommended memory modules.

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

Installing & Removing DIMMs

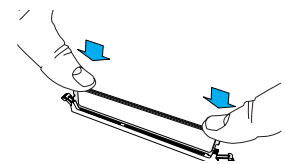
1. Insert the desired number of DIMMs into the memory slots, starting with P1-DIMMA1. For best performance, please use DIMM modules of the same type and speed in the same bank.
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.

Figure 5-3. Installing DIMMs



3. Align the key of the DIMM module with the receptive point on the memory slot.
4. Align the notches on both ends of the module against the receptive points at each side of the slot.
5. With your thumbs, press the notches on both ends of the module straight down into the slot until the module snaps into place.
6. Press the release tabs to their locking positions to secure the DIMM into the slot.

Press both notches straight down into the memory slot at the same time.



Note: 4 GB, 8 GB, 16 GB, 32 GB, 64 GB, 128 GB (3DS LRDIMM only) size memory modules are supported. It is highly recommended that you remove the power cord from the system before installing or changing memory modules. Please refer to our web site for memory that has been tested on the X10DSN-TS serverboard.

Removing Memory Modules

Press both release tabs on the ends of the DIMM to unlock it. Once the DIMM is loosened, remove it from the memory slot.

Memory Support

The X10DSN-TS has sixteen (16) DIMM slots supporting up to 1 TB of RDIMM registered ECC or 2 TB of LRDIMM DDR4 (288-pin) ECC 2400/2133/1866/1600 MHz speed SDRAM at 1.2V voltages.

Note: Check the Supermicro website (www.supermicro.com) for the latest memory support information.

Maximum Memory

The X10DSN-TS serverboard supports up to 1 TB of ECC 240-pin Registered (RDIMM) or 2 TB of Load Reduced (LRDIMM) ECC memory in sixteen (16) DIMM slots.

Processor & Memory Module Population Configuration

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

Populating RDIMM/LRDIMM/NV-DIMM ECC Memory Modules

Processors and their Corresponding Memory Modules								
CPU#	**Corresponding DIMM Modules**							
CPU 1 P1-DIMM-	A1	B1	C1	D1	A2	B2	C2	D2
CPU2 P2-DIMM-	E1	F1	G1	H1	E2	F2	G2	H2

Processor and Memory Module Population for Optimal Performance	
Number of CPUs+DIMMs	**CPU and Memory Population Configuration Table (For memory to work properly, please follow this table.)**
1 CPU & 2 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1
1 CPU & 4 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1
1 CPU & 6~8 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1 + any pair of P1-DIMMA2/P1-DIMMB2/P1-DIMMC2/P1-DIMMD2 slots
2 CPUs & 4 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1
2 CPUs & 6 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1
2 CPUs & 8 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1
2 CPUs & 9~16 DIMMs	CPU1/CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1 + any pair of P1, P2 DIMM slots

Populating RDIMM/LRDIMM DDR4 Memory Modules on the Motherboard

Populating RDIMM/LRDIMM DDR4 Memory Modules							
Type	**Ranks Per DIMM and Data Width**	**DIMM Capacity (GB)**		**Speed (MT/s); Voltage (V); Slots per Channel (SPC) and DIMMs per Channel (DPC)**			
				2 Slots per Channel			
				1 DPC		**2 DPC**	
				E5-2600 V3	**E5-2600 V4**	**E5-2600 V3**	**E5-2600 V4**
		4 Gb	**8 Gb**	**1.2 V**	**1.2 V**	**1.2 V**	**1.2 V**
RDIMM	SRx4	8 GB	16 GB	2133	2400	1866	2133
RDIMM	SRx8	4 GB	8 GB	2133	2400	1866	2133
RDIMM	DRx8	8 GB	16 GB	2133	2400	1866	2133
RDIMM	DRx4	16 GB	32 GB	2133	2400	1866	2133
LRDIMM	QRx4	32 GB	64 GB	2133	2400	2133	2400
LRDIMM 3DS	8Rx4	64 GB	128 GB	2133	2400	2133	2400

5-6 Adding PCI Expansion Cards

The SSG-2028R-DN2R24L includes two preinstalled riser cards (RSC-X-68-C) designed specifically for use in the SC227TS-R2K05P2 2U rackmount chassis. These riser cards support the following PCI Express cards to fit inside the chassis for each node:

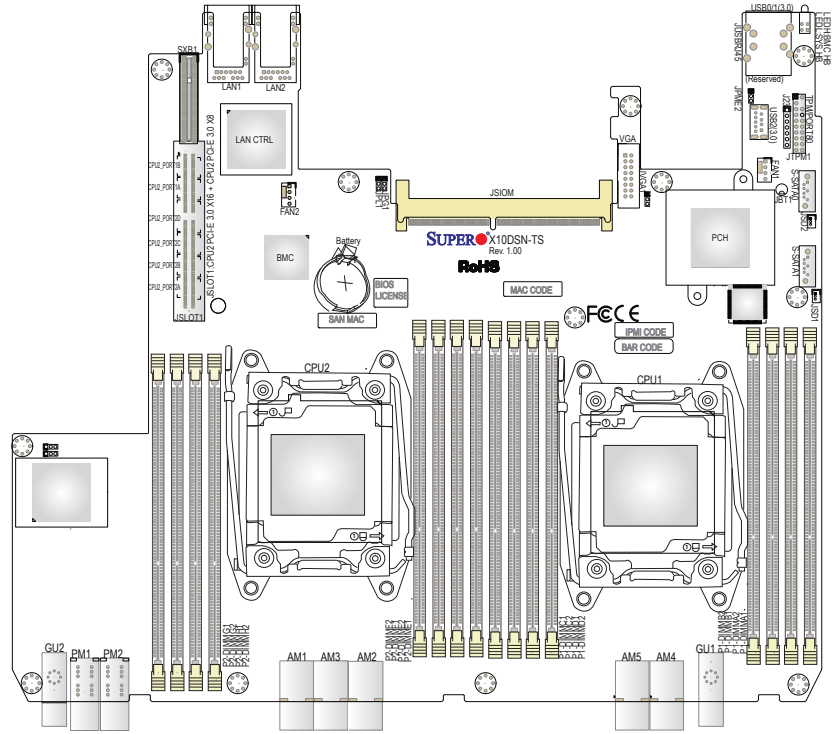
- One (1) PCI-Express 3.0 x16 low-profile slot
- One (1) PCI-Express 3.0 x8 low-profile slot

Installing an Expansion Card

1. After powering down the system, remove the PCI slot shield.
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 screw to secure the top of the card shield to the chassis. The PCI slot shield protects the motherboard and its components from EMI and aid in proper ventilation, so make sure it is always in place.

5-7 Motherboard Details

Figure 5-2. X10DSN-TS Motherboard Layout
(not drawn to scale)



Notes:

1. For the latest CPU/Memory updates, please refer to our website at http://www.supermicro.com/products/motherboard/ for details.
2. Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion.
3. Jumpers not indicated are for test purposes only.
4. All graphics shown in this manual were based upon the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in this manual.

X10DSN-TS Jumpers		
Jumper	**Description**	**Default Setting**
JBT1	Clear CMOS/Reset BIOS Configuration	See Section 5-9 for details.
JPB1	BMC Enable	Pins 1-2 (Enabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1	LAN1/LAN2 Enable	Pins 1-2 (Enabled)
JPME2	Manufacture (ME) Mode Select	Pins 1-2 (Normal)

X10DSN-TS Connectors	
Connectors	**Description**
Battery (JBAT1)	Onboard CMOS battery (see Section 5-13 for details)
FAN1/FAN2	CPU/system fan headers (Fan 1/Fan 2)
JSD1/JSD2	SATA DOM (Device on Module) power connectors 1/2
JSIOM	SMCI-proprietary I/O module for add-on card use
JSLOT1+SXB	CPU2 PCI-E 3.0 x16 + CPU2 PCI-E 3.0 x8 slot
JTPM1	TPM (Trusted Platform Module)/Port 80 header
LAN1/LAN2	10_Gigabit (T) Ethernet LAN ports 1/2 on the I/O back panel
S-SATA 0/1	S-SATA 3.0 connections (0/1) supported by Intel PCH w/support of SMCI SuperDOM w/power pins built-in)
(BP) USB 0/1 (3.0)	Backpanel USB 3.0 ports 0/1
USB 2 (3.0)	Type A USB 3.0 connection header for front access (USB 2)
VGA (JVGA1)	VGA connection header

X10DSN-TS Onboard LED Indicators			
LED	**Description**	**State**	**Status**
LEDH (Top LED)	BMC Heartbeat LED	Green: Blinking	BMC Normal
LEDL (Bottom LED)	System Heartbeat LED	Green: Blinking	System Normal

5-8 Connector Definitions

Universal Serial Bus (USB)

Two USB 3.0 ports (USB 0/1) are located on the I/O backpanel. In addition, a Type A USB connector (USB 2), located close to USB 0/1 ports, also provides USB 3.0 support for front access. (Cables are not included.) See the table on the right for pin definitions.

Back Panel USB 0/1 (3.0) Type A USB 2 (3.0) Pin Definitions	
Pin#	Description
1	VBUS
2	D-
3	D+
4	Ground
5	SSRX-
6	SSRX+
7	GND_DRAIN
8	SSTX-
9	SSTX+

LAN Port 1/LAN Port 2

Two 10_Gigabit Ethernet LAN ports (LAN1, LAN2) are located on the I/O backplane on the motherboard. Both ports accept RJ45 type cables. Please refer to the LED Indicator Section for LAN LED information.

Fan Headers

There are two 4-pin system/CPU fan headers (FAN1/FAN2) on the motherboard. These fans headers are backward-compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only by Thermal Management via IPMI 2.0. See the table on the right for pin definitions.

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

Video Connection

A Video (VGA) port is located next to the PCH chip on the motherboard. Refer to the board layout below for the location.

DOM Power Connectors

Two power connectors for SATA DOM (Disk_On_Module) devices are located at JSD1/JSD2. Connect appropriate cables here to provide power supply for your Serial Link DOM devices.

DOM PWR Pin Definitions

Pin#	Definition
1	+5V
2	Ground
3	Ground

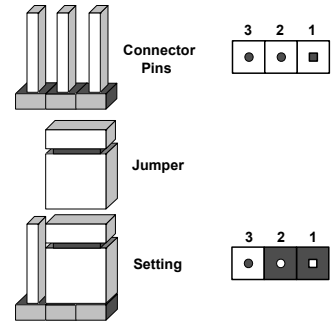
TPM/Port 80 Header

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

TPM/Port 80 Header Pin Definitions

Pin#	Definition	Pin#	Definition
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	No Connection
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	No Connection	14	No Connection
15	+3V STBY	16	SERIRQ
17	GND	18	CLKRUN#
19	LPCPD#	20	No Connection

5-9 Jumper Settings



Explanation of Jumpers

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

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


JBT1 contact pads

CMOS Clear

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

To Clear CMOS

1. First power down the system and unplug the power cord(s). It is also recommended that you remove the onboard battery from the serverboard.
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

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

VGA Enable

Jumper JPG1 allows the user to enable the onboard VGA connector. The default setting is 1-2 to enable the connection. See the table on the right for jumper settings.

VGA Enable Jumper Settings

Jumper Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

LAN Enable/Disable

JPL1 enables or disables onboard LAN Ports 1/2 on the motherboard. These LAN ports support 10 Gigabit Ethernet LAN connections. See the table on the right for jumper settings. The default setting is Enabled.

LAN Enable Jumper Settings

Jumper Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

Manufacturer Mode Select

Close pin 2 and pin 3 of Jumper JPME2 to bypass SPI flash security and force the system to operate in the manufacturer mode, which will allow the user to flash the system firmware from a host server for system setting modifications. See the table on the right for jumper settings.

ME Mode Select Jumper Settings

Jumper Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	Manufacture Mode

BMC Enable

Jumper JPB1 allows you to enable the embedded ASpeed AST2400 Baseboard Management Controller (BMC) to provide IPMI 2.0/KVM support on the motherboard. See the table on the right for jumper settings.

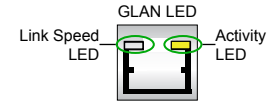
BMC Enable Jumper Settings

Jumper Setting	Definition
Pins 1-2	BMC Enable (Default)
Pins 2-3	Disabled

5-10 Onboard Indicators

LAN LEDs

There are two LAN ports on the I/O backpanel. These LAN ports support 10-Gigabit LAN connections. Each LAN port has two LEDs. The Yellow LED on the right indicates activity. The Link LED on the left side may be green, amber or off to indicate the speed of the connection. See the tables at right for more information.



LAN Port Activity LED (Left) LED State

Color	Status	Definition
Orange	Flashing	Active

10Gbps LAN Link LED Settings

Color	Definition
Off	No Connection, 10 or 100 Mbps
Green	10 Gbps
Amber	1 Gbps

BMC Heartbeat LED

A BMC (Baseboard Management Controller) Heartbeat LED is located at LEDH (BMCHB) on the I/O backpanel, which is the top LED indicator on the backpanel. When this LED is blinking, BMC is functioning normally. See the table at right for more information.

BMC Heartbeat LED States

Color/State	Definition
Green: Blinking	BMC: Normal

System Heartbeat LED

The System Heartbeat LED is located at LEDL (SYSLED) on I/O backpanel. When this LED is blinking, your system is normal. See the table at right for more information.

System Heartbeat LED States

Color/State	Definition
Green: Blinking	System: Normal

5-11 Serial ATA Connections

S-SATA 3.0 Ports

Two S-SATA 3.0 ports (S-SATA0/S-SATA1), supported by the Intel PCH chip, are located on the motherboard. These SATA ports are used with Supermicro SuperDOM (Disk-on-Module) connectors, which are yellow SATA connectors with power-pins built-in, and are backward-compatible with regular SATA HDDs and SATA DOMs. All SATA ports provide serial-link signal connections, which are faster than the connections of Parallel ATA.

Note 1: Supermicro SuperDOMs are yellow SATADOM connectors with power pins built-in and do not require separate external power cables. These connectors are backward-compatible with non-Supermicro SATADOMs that require an external power supply.

Note 2: For more information on the SATA HostRAID configuration, please refer to the Intel SATA HostRAID user's guide posted on our website @ http://www.supermicro.com.

5-12 Installing Drivers

The CD that came bundled with the system contains drivers, some of which must be installed, such as the chipset driver. After inserting this CD into your CD-ROM drive, the display shown in Figure 5-3 should appear. (If this display does not appear, click on the My Computer icon and then on the icon representing your CD-ROM drive. Finally, double click on the S "Setup" icon.)

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 should reboot 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.

Figure 5-3. Driver/Tool Installation Display Screen

SuperDoctor 5

The Supermicro SuperDoctor® 5 is a hardware and operating system services monitoring program that functions in a command-line or web-based interface in Windows and Linux operating systems. The program monitors system health information such as CPU temperature, system voltages, system power consumption, fan speed, and provides alerts via email or Simple Network Management Protocol (SNMP).

SuperDoctor 5 comes in local and remote management versions and can be used with Nagios to maximize your system monitoring needs. With SuperDoctor 5 Management Server (SSM Server), you can remotely control power on/off and reset chassis intrusion for multiple systems with SuperDoctor 5 or IPMI. SD5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.

Note: The default User Name and Password for SuperDoctor 5 is admin / admin.

Figure 5-4. SuperDoctor 5 Interface Display Screen (Health Information)

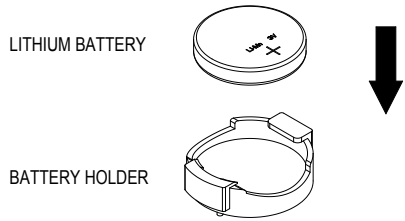
Figure 5-5. SuperDoctor 5 Interface Display Screen (Remote Control)

Note: The SuperDoctor 5 program and User's Manual can be downloaded from the Supermicro web site at http://www.supermicro.com/products/nfo/sms_sd5.cfm. For Linux, we recommend that you use the SuperDoctor II application instead.

5-13 Serverboard Battery

Caution: There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see Figure 5-6). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032). Dispose of used batteries according to the manufacturer's instructions.

Figure 5-6. Installing the Onboard Battery



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

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC227 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.

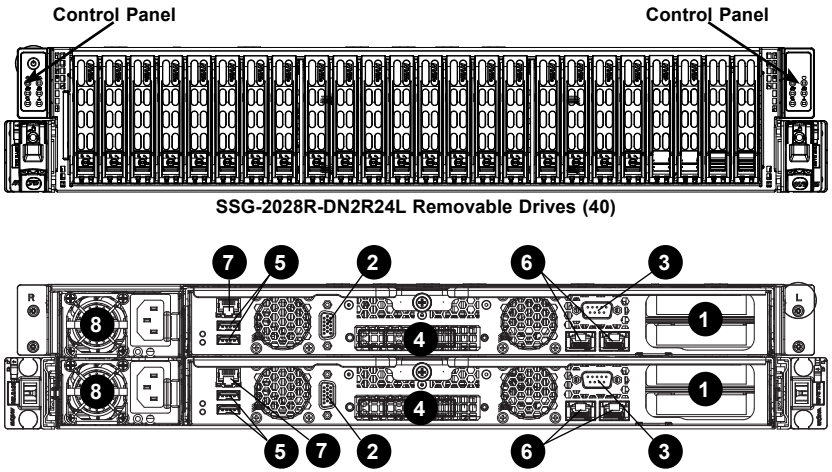


Figure 6-1. Front and Rear Chassis Views

Rear Chassis Features	
Item	**Description**
1	Two PCI-E (one x8, one x16) slots each node
2	One VGA port each node
3	One COM port each node
4	One SIOM I/O port each node
5	Two USB 3.0 Ports each node
6	Two 10GBase-T RJ45 LAN ports each node
7	Dedicated IPMI LAN port each node
8	Power Supplies (2)

Note: The above table applies the same to each of the two nodes of the system.

6-2 Control Panel

The control panels are connected to the serverboards through the midplane. The LEDs on the control panels are associated with the node on the same side of the chassis. Note that only the left-side control panel includes a power button. Depressing this button will turn both nodes on or based on BIOS setting.

See Chapter 3 for details on the LEDs and the control panel buttons.

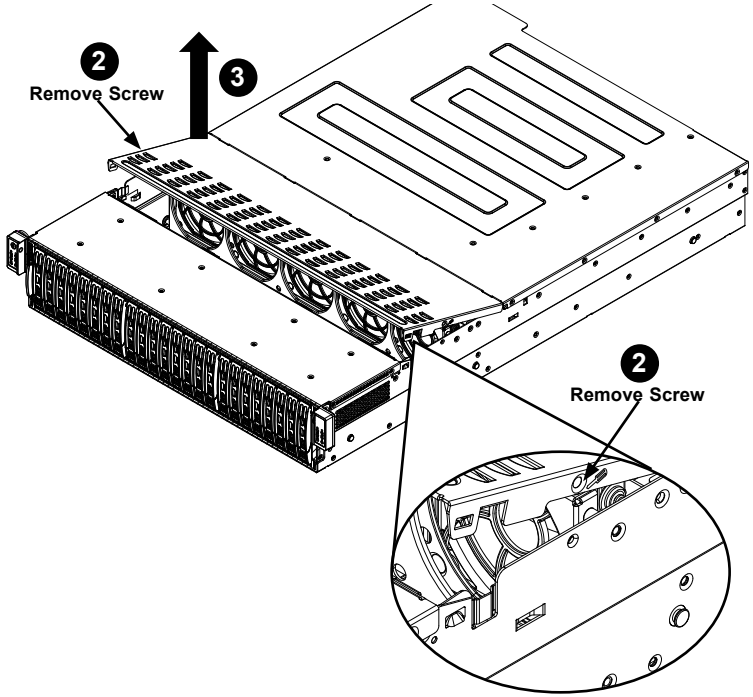
6-3 Removing the Power Cord

Before performing any setup or maintenance on the chassis, use the following procedure to ensure that power has been disconnected from the system.

1. Use the operating system to power down the system, following the on-screen prompts.
2. After the system has completely shut-down, carefully grasp the head of the power cord and gently pull it out of the back of the power supply. If your system has redundant power supplies, remove the cords from both power supplies.
3. Disconnect the cord from the power strip or wall outlet.

6-4 Removing the Front Cover

Figure 6-2. Removing the Front Cover



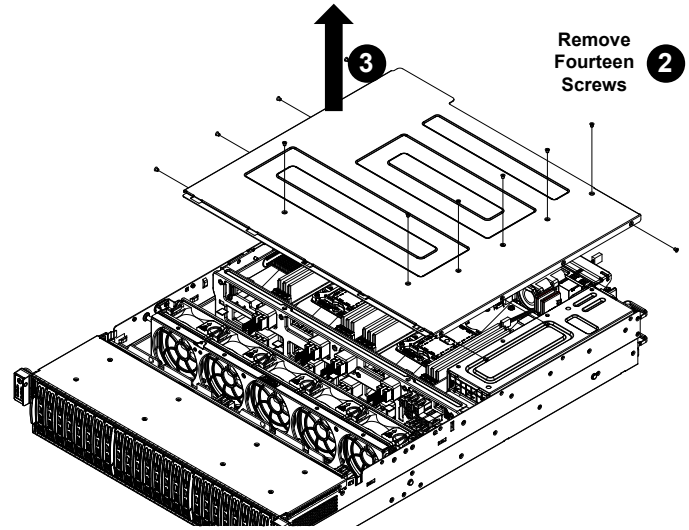
Removing the Front Cover

1. Power down the system and remove the power cords from the rear of the power supplies as described in Section 6-3.
2. Remove the two screws securing each side of the top front cover .
3. Push in the release buttons on both sides of the chassis.
4. Lift the top front cover off the chassis.

Caution: Except for short periods of time, do *not* operate the server without the cover in place. The chassis cover assists with proper airflow that prevents overheating.

6-5 Removing the Rear Cover

Figure 6-3. Removing the Rear Cover



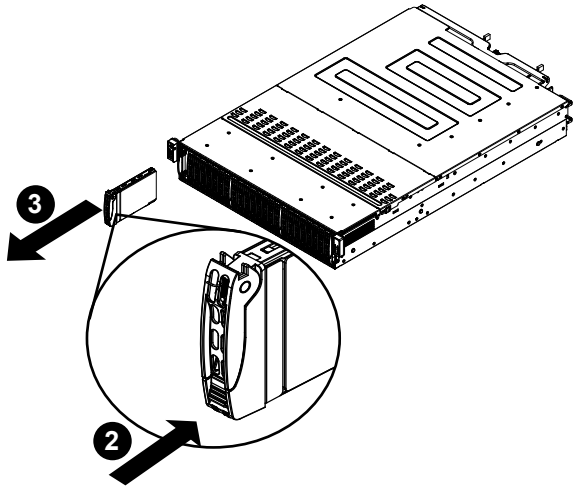
Removing the Rear Cover

1. Power down the system and remove the power cords from the rear of the power supplies as described in Section 6-3.
2. Remove the front cover as described in Section 6-4.
3. Remove the fourteen screws securing the rear cover to the chassis and set them aside for use when the cover is replaced..
4. Lift the rear cover off the chassis.

Caution: Except for short periods of time, do *not* operate the server without the cover in place. The chassis cover assists with proper airflow that prevents overheating.

6-6 Installing Hard Drives

Figure 6-4. Removing Hard Drive

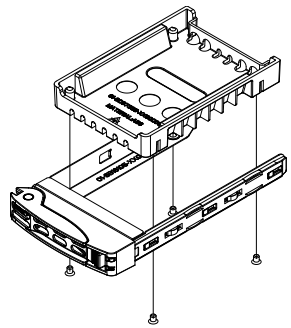


The SC227 comes equipped with twenty-four 2.5" hot-swappable hard drives. These drives can be removed without powering down the system. Only enterprise level NVMe drives are recommended.

Removing Hard Drive Carriers from the Chassis

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

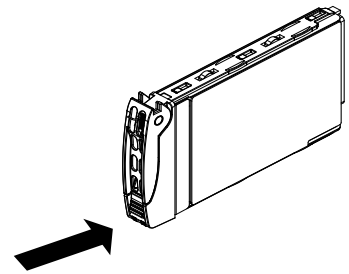
Figure 6-5. Removing the Dummy Drive from the Hard Drive Carrier



Installing a Hard Drive into a Drive Carrier

1. Remove the dummy drive, which comes pre-installed in the drive carrier, by removing the screws securing the dummy drive to the carrier. Note that these screws cannot be reused on the actual 2.5" hard drive.
2. Insert a drive into the carrier with the PCB side facing down and the connector end toward the rear of the carrier.
3. Align the drive in the carrier so that the screw holes of both line up.
4. Secure the drive to the carrier with four screws. These screws are included in the chassis accessory box.
5. Insert the drive carrier into its bay, keeping the carrier oriented so that the release button is on the bottom side. When the carrier reaches the rear of the bay, the release handle will retract.
6. Push the handle in until it clicks into its locked position.

Figure 6-6. Proper Installation of the Hard Drive into the Hard Drive Bay



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

6-7 Motherboard Installation

Removing the Motherboard Modules

The SC227 features a removable motherboard module that allows easy access to the motherboard.

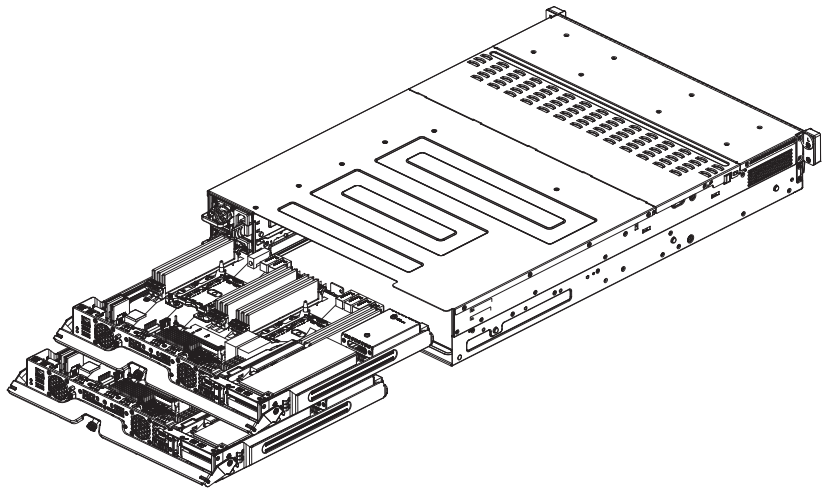
Removing the Motherboard Module

1. Power down the system and remove the power cords from the rear of the power supplies as described in Section 6-3. Remove the front and rear covers as described in Section 6-4 and Section 6-5.
2. Loosen the thumbscrew in the center of the motherboard module.
3. Lower the handle on the front of the motherboard module that you wish to remove.
4. Grasp the handle of the motherboard module and pull it out of the chassis.

Installing the Motherboard Module

1. Return the motherboard module to the bay in the chassis that it was removed from.
2. Raise the handle of the motherboard module to lock it into the chassis bay.
3. Secure the module into the chassis by tightening the thumbscrew at the center of the module.
4. Plug the power cords into the rear of the power supplies and power up the system.

Figure 6-7. Removing the Motherboard Modules

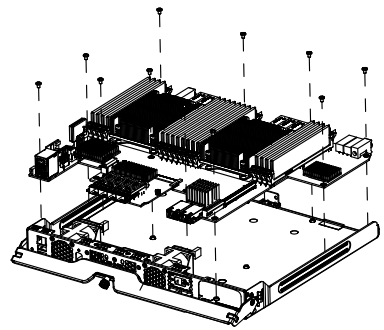


Motherboard Installation

Removing and Installing the Motherboard

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, precautions, and cable connections.
2. Power down the system as described in Section 5-2.
3. If necessary, remove the air shroud by lifting it off, and remove the riser card bracket by removing the screws that secure it to the module and lifting it off.
4. As required by your motherboard, install standoffs in any areas that do not have a permanent standoff and remove any standoffs that are not required by the motherboard. Additional information on permanent and optional standoffs is located in the following section.
5. Lay the motherboard in the module, aligning the mounting holes in the motherboard with those in the module.
6. Secure the motherboard to the module using the rounded, Phillips head screws which are included in the motherboard bag of the accessory box. Do not exceed eight pounds of torque when securing the motherboard.
7. Secure the CPUs, 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. Additionally, the fans may be temporarily removed to allow access to the backplane ports and to allow for ease of installation.

Figure 6-8. Installing the Motherboard

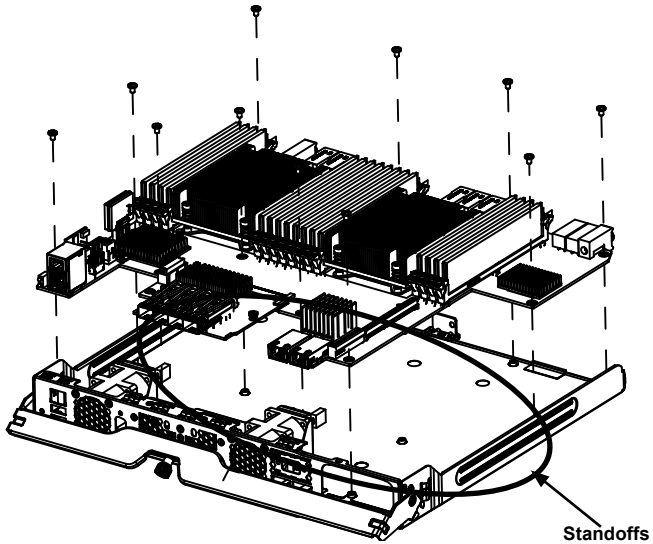


Permanent and Optional Standoffs

Standoffs prevent short circuits by creating space between the motherboard and the chassis surface. The SC227 chassis includes permanent and removable standoffs in locations used by default motherboards. These standoffs can be removed with a wrench and are included in the accessories package.

Some motherboards require additional screws for heatsinks, general components or non-standard security. Optional standoffs are included for these motherboards. To use an optional standoff, place the hexagonal nut with the rounded side up, in the holes provided on the floor of the chassis.

Figure 6-9. Chassis Standoffs and Motherboard Installation



6-8 Installing the Expansion Cards

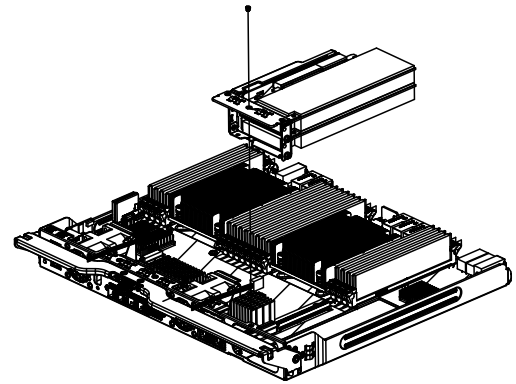
The SC227 provides two PCI slots for low-profile expansion cards. Note that the motherboard must be installed prior to the installation of the expansion cards.

Installing Expansion Cards

Installing an Expansion Cards

1. Power down the system and remove the power cords from the rear of the power supplies as described in Section 6-3.
2. Remove the motherboard modules as described in Section 6-7.
3. Plug the expansion cards into the expansion card bracket and connect the COM port cable.
4. Place the expansion card bracket onto the motherboard as shown.
5. Secure the expansion card bracket onto the motherboard using the screw provided.
6. Plug the power cords into the rear of the power supplies and power up the system.

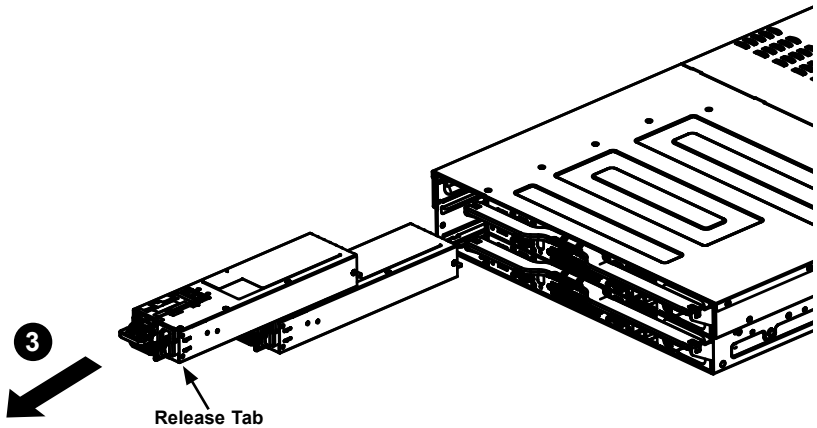
Figure 6-10. Removing the PCI Slot Shield



6-9 Changing the Power Supplies

The SC227 chassis has two redundant power supplies. The power modules are hot-swappable, enabling the power supplies to be changed without powering down the system. These power supplies are auto-switching capable. This enables the power supply 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.

Figure 6-11. Removing the Power Supply



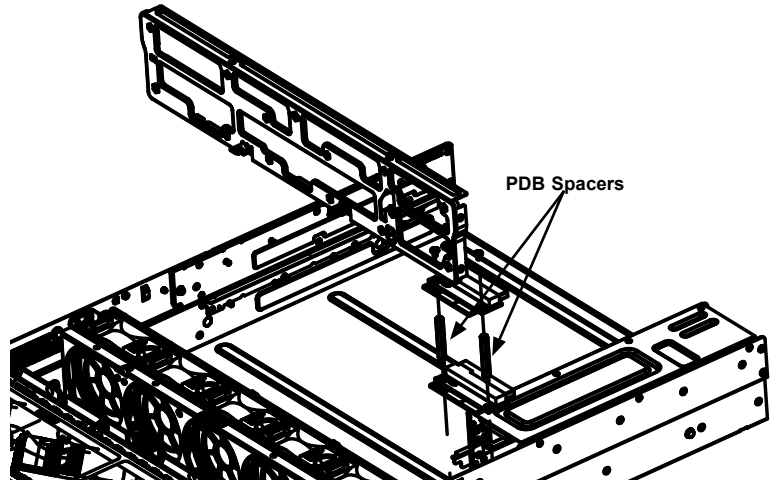
Changing a Power Supply

1. Determine which power supply needs to be replaced and unplug the power cord to that module.
2. Push the release tab (on the back of the power supply) as illustrated, to release the power module from the chassis.
3. While holding down the release tab, pull the power supply out using the handle provided on the power module.
4. Replace the failed power module with the same model power supply.
5. Push the new power supply module into the power bay until the tab clicks into the locked position.
6. Plug the AC power cord back into the power module and the module will automatically power-up.

6-10 Power Distributor Board

The SC227 chassis requires two power distributor boards. These boards are located behind the power supplies and are separated with a set of spacers. In the unlikely event that a board needs to be replaced, use the following instructions.

Figure 6-12. Installing the Power Distributor Board and Spacers



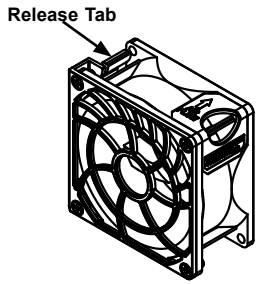
Changing the Power Distributor Board

1. Power down the system and remove the power cords from the rear of both power supplies as described in Section 6-3. Remove the covers as described in Section 6-4 and Section 6-5. Remove the motherboard modules as described in Section 6-7.
2. Remove the two upper screws securing the upper power distributor board to the spacers and set them aside for later use.
3. Lift the upper power distributor board up and out of the chassis.
4. Twist the spacers clockwise to remove them and set them and set them aside for later use.
5. Lift the lower power distributor board up and out of the chassis.
6. Replace the lower power distributor board with a new one of the same type.
7. Insert the spacers into the mounting holes on the lower power distributor board and tighten them by turning them counter-clockwise.
8. Stack the new upper power distributor board on top of the spacers.
9. Plug the AC power cords back into both of the power modules, replace the chassis covers and power up the system.

6-11 System Fans

Five heavy-duty fans provide cooling for the chassis. These fans circulate air through the chassis as a means of lowering the chassis internal temperature. The SC227 fans are hot-swappable, enabling the fans to be replaced without powering down the system.

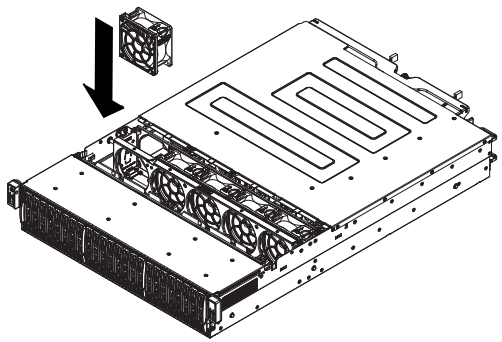
Figure 6-13. System Fan



Replacing a System Fan

1. While the power is running to determine which fan needs to be replaced (Never run the server for an extended period of time with the cover(s) open.)
2. Power down the system as described in Section 6-3 and open the chassis covers as described in Sections 6-4 and 6-5.
3. Press the fan release tab to lift the failed fan from the chassis and pull it completely out of the chassis.
4. Place the new fan into the vacant space in the chassis while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.
5. The fan will automatically begin running at the correct speed.

Figure 6-14. Placing the System Fan



6-12 Removing and Installing the Backplanes

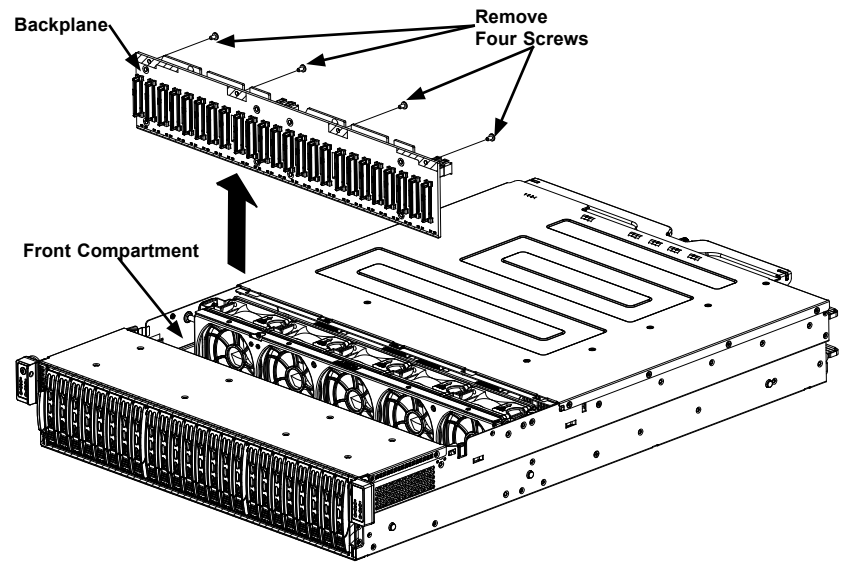
The SC227 chassis features a single backplane in the chassis.

Removing the Backplane

Removing the First Backplane from the Front Compartment

1. Power down the system and remove the power cords as described in Section 6-3 and open the chassis covers as described in Sections 6-4 and 6-5.
2. Remove the backplane shield from above the backplane.
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 screws at the top of the backplane.
6. Lift the backplane up and out of the chassis.

Figure 6-15. Removing the Front Backplane

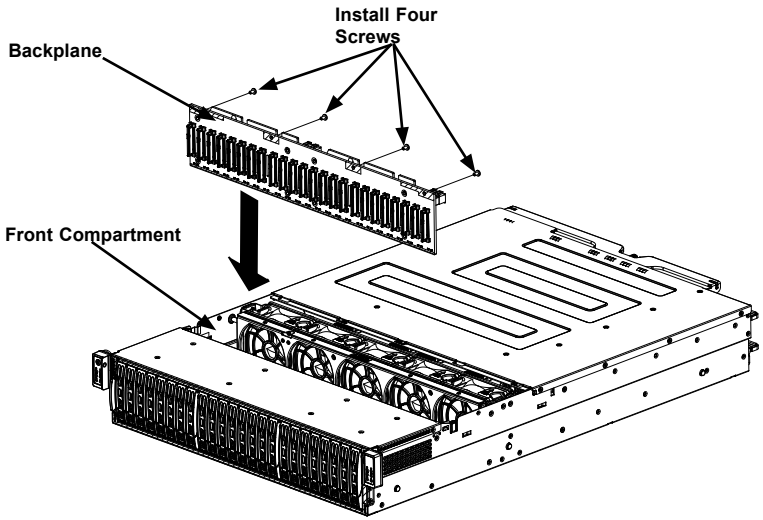


Installing the Backplane

Installing the Backplane Into the Chassis

1. Power down the system and remove the power cords as described in Section 6-3. Open the chassis covers as described in Sections 6-4 and 6-5.
2. Ensure that all of the hard drives have been removed from the hard drive bays.
3. Place the backplane in the chassis, aligning the holes in the backplane with the mounting holes in the chassis. Secure with the four screws previously set aside.
4. Reconnect the cabling to the backplane.
5. Replace the backplane shields over the backplane.
6. Plug the power cords into the rear of the power supplies and power up the system.

Figure 6-16. Installing the Front Backplane



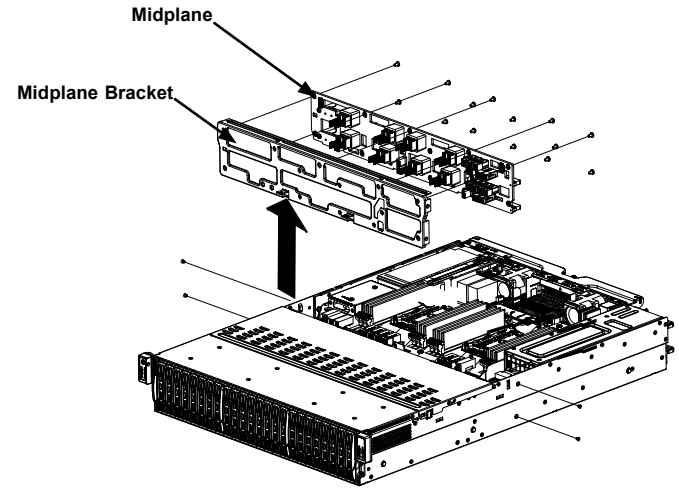
6-13 Removing and Installing the Midplane

Removing the Midplane

Removing the Midplane from the Chassis

1. Power down the system as described in Section 6-3 and open the chassis covers as described in Sections 6-4 and 6-5.
2. Disconnect the cabling to the midplane.
3. Remove the four screws from both sidewalls of the chassis and the two screws at the base of the chassis.
4. Lift the midplane bracket up and out of the chassis.
5. Remove the fourteen screws securing the midplane to the midplane bracket.
6. Remove the midplane from the bracket.

Figure 6-17. Installing the Midplane

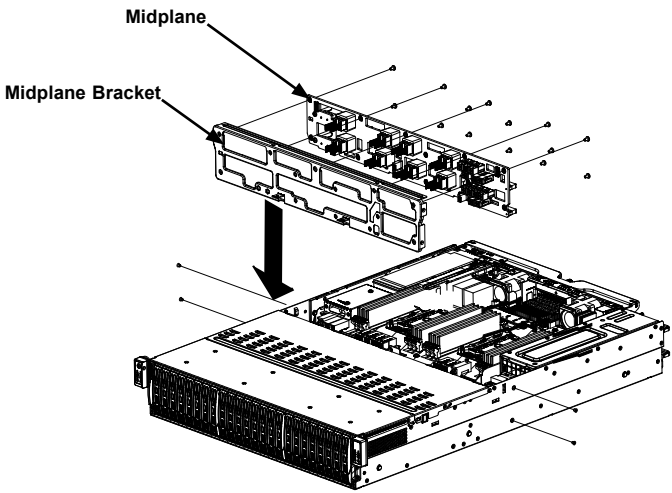


Installing the Midplane

Installing the Midplane Into the Chassis

1. Power down the system as described in Section 6-3 and open the chassis covers as described in Sections 6-4 and 6-5.
2. Put the midplane into the midplane bracket, aligning the holes in the midplane with those in the bracket.
3. Reinstall the fourteen screws securing the midplane to the midplane bracket.
4. Reconnect the cabling to the midplane.
5. Place the midplane and midplane bracket into the chassis and secure them with four screws in the sidewalls and two at the base of the chassis.
6. Plug the power cords into the rear of the power supplies and power up the system.

Figure 6-18. Installing the Midplane



Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS setup utility for the X10DSN-TS. The 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 screens.

Note: For AMI BIOS recovery, please refer to the UEFI BIOS Recovery Instructions in Appendix C.

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 AMI 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>, <F4>, <Enter>, <Esc>, arrow keys, etc.

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

How To Change the Configuration Data

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

How to Start the Setup Utility

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

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

7-2 Main Setup

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

The following Main menu items will be displayed:

System Date/System Time

Use this option to change the system date and time. Highlight *System Date* or *System Time* using the arrow keys. Enter new values using the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in MM/DD/YYYY 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 X10DSN-TS

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

Build Date: This item displays the date when the version of the BIOS ROM used in the system was built.

CPLD (Complex Programmable Logic Device) Version: This item displays the CPLD version used in the system.

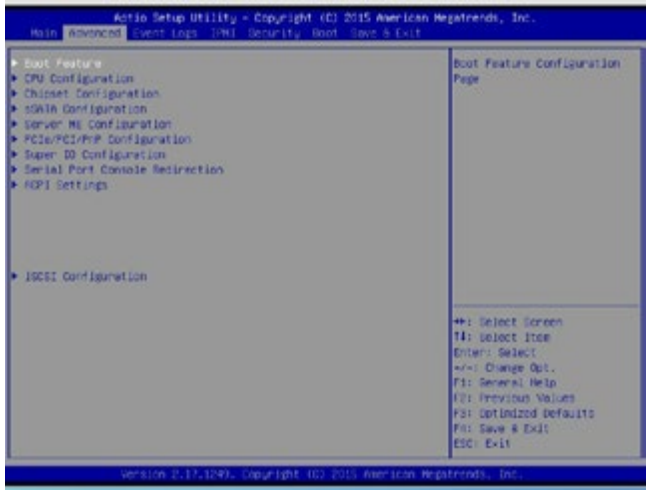
Memory Information

Total Memory: This item displays the total size of memory available in the system.

Memory Speed: This item displays the default speed of the memory modules installed in the system.

7-3 Advanced Setup Configurations

Use the arrow keys to select Advanced setup and press <Enter> to access the submenu items:



Warning: Take Caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency or an incorrect BIOS timing setting may cause the system to malfunction. When this occurs, restore the setting to the manufacture default setting.

▶Boot Feature

Quiet Boot

Use this item to select the screen display between POST messages or the OEM logo at bootup. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

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

Bootup Num-Lock State

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

Wait For 'F1' If Error

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

INT19 Trap Response

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

Re-try Boot

Select EFI Boot to allow the BIOS to automatically reboot the system from an EFI boot device after the initial boot failure. Select Legacy Boot to allow the BIOS to automatically reboot the system from a Legacy boot device after its initial boot failure. The options are **Disabled**, Legacy Boot, and EFI Boot.

Power Configuration

CPLD Watch Dog Function

Select Enabled to allow the CPLD **(**Complex Programmable Logic Device) Watch Dog timer to reboot the system when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

Watch Dog Function

Select Enabled to allow the Watch Dog timer to reboot the system when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

Power Button Function

This feature controls how the system shuts down when the power button is pressed. Select 4 Seconds Override for the system to power off after the user presses and holds the power button for 4 seconds or longer. Select Instant Off to instantly power off the system as soon as the user presses the power button. The options are 4 Seconds Override and **Instant Off.**

Restore on AC Power Loss

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

▶CPU Configuration

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

- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ratio
- Processor Min Ratio
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- CPU 1 Version
- CPU 2 Version

Clock Spread Spectrum

Select Enabled to allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

Hyper-Threading (All)

Select Enable to support Intel's Hyper-threading Technology to enhance CPU performance. The options are **Enable** and Disable.

Cores Enabled

This feature allows the user to determine the number of CPU cores to be enabled. Enter "0" to enable all cores. The default setting is **0**, which enables all CPU cores in the system.

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

Select Enable for Execute Disable Bit Technology support, which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor to damage the system during an attack. The options are **Enable** and Disable. (Refer to Intel's and Microsoft's websites for more information.)

PPIN Control

Select Unlock/Enable to use the Protected-Processor Inventory Number (PPIN) control in the system. The options are **Unlock/Enable** and Unlock/Disable.

Hardware Prefetcher (Available when supported by the CPU)

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

Adjacent Cache Prefetch (Available when supported by the CPU)

Select Enable for the CPU to prefetch both cache lines for 128 bytes as comprised. Select Disable for the CPU to prefetch both cache lines for 64 bytes. The options are Disable and **Enable**.

> **Note**: Please reboot the system for the changes made on this setting to take effect. Please refer to Intel's website for detailed information.

DCU (Data Cache Unit) Streamer Prefetcher (Available when supported by the CPU)

If set to Enable, the DCU Streamer prefetcher will prefetch data streams from the cache memory to the DCU (Data Cache Unit) to speed up data accessing and processing to enhance CPU performance. The options are Disable and **Enable**.

DCU IP Prefetcher

If set to Enable, the IP prefetcher in the DCU (Data Cache Unit) will prefetch IP addresses to improve network connectivity and system performance. The options are **Enable** and Disable.

Direct Cache Access (DCA)

Select Enable to use Intel DCA (Direct Cache Access) Technology to improve the efficiency of data transferring and accessing. The options are **Auto**, Enable, and Disable.

X2 APIC (Advanced Programmable Interrupt Controller)

Based on Intel's Hyper-Threading architecture, each logical processor (thread) is assigned 256 APIC IDs (APIDs) in 8-bit bandwidth. When this feature is set to Enable, the APIC ID will expand(X2) from 8 bits to 16 bits to provide 512 APIDs to each thread to enhance CPU performance. The options are **Disable** and Enable.

AES-NI

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

Intel Virtualization Technology

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

▶Advanced Power Management Configuration

Advanced Power Management Configuration

Power Technology

Select Energy Efficient to support power-saving mode. Select Custom to customize system power settings. Select Disable to disable power-saving settings. The options are Disable, **Energy Efficient**, and Custom.

**If the option is set to Custom or Energy Efficient, the following items will display:*

Energy Performance Tuning (Available when Power Technology is set to Custom or Energy Efficient)

Select Enable for energy-performance tuning support to enhance energy efficiency, which might compromise system performance. The options are Enable and **Disable**.

Energy Performance Bias Setting (Available when Power Technology is set to Custom or Energy Efficient)

Use this feature to select an appropriate power setting and performance level for the system. Select Performance to maximize system performance by using maximum amount of power. Select Balanced Performance to downgrade system performance a notch by using less power. Select Power to maximize power saving, which may greatly compromise system performance as a result. Select Balanced Power to downgrade power saving a notch and allow the system to use more power to boost system performance. The options are Performance, Balanced Performance, Balanced Power, and Power.

Energy Efficiency Turbo (Available when Power Technology is set to Custom or Energy Efficient)

Select Enable for the system to operate at turbo mode with reduced power consumption so that your machine can achieve maximum system performance with the maximum power efficiency possible. The options are **Enable** and Disable.

**If the option is set to Custom, the following items will display:*

▶CPU P State Control (Available when Power Technology is set to Custom)

EIST (P-states)

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are Disable and **Enable**.

Turbo Mode

Select Enable to use the Turbo Mode to boost system performance. The options are **Enable** and Disable.

P-state Coordination

This item is used to change the P-state (Power-Performance State) coordination type. P-state is also known as "SpeedStep" for Intel processors. Select HW_ALL to change the P-state coordination type for hardware components only. Select SW_ALL to change the P-state coordination type for all software installed in the system. Select SW_ANY to change the P-state coordination type for a software program in the system. The options are **HW_All,** SW_ALL, and SW_ANY.

▶CPU C State Control (Available when Power Technology is set to Custom)

Package C State limit

Use this item to set the limit on the C-State package register. The options are C0/1 state, C2 state, **C6 (non-Retention) state**, and C6 (Retention) state.

CPU C3 Report

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

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

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

Enhanced Halt State (C1E)

Select Enable to use the "Enhanced Halt State" feature, which will significantly reduce the CPU's power consumption by reducing CPU's clock cycle and voltage during a "Halt State." The options are Disable and **Enable**.

▶CPU T State Control (Available when Power Technology is set to Custom)

ACPI (Advanced Configuration Power Interface) T-States

If this item is set to Enable, CPU throttling will be supported by the operating system to reduce power consumption. The options are **Enable** and Disable.

▶Chipset Configuration

Warning! Please set the correct settings for the items below. A wrong configuration setting may cause the system to malfunction.

▶North Bridge

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

▶IIO Configuration

EV DFX (Device Function On-Hide) Features

When this feature is set to Enable, the EV_DFX Lock Bits that are located on a processor will always remain clear during electric tuning. The options are **Disable** and Enable.

▶IIO1 Configuration

IOU2 (IIO1 PCIe Port 1)

This item configures the PCI-E port Bifuraction setting for a PCI-E port specified by the user. The options are x4x4, x8, and **Auto**.

IIO1 Port 1A Link Speed

This item configures the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s), and **Gen 3 (Generation 3) (8 GT/s).**

IOU0 (IIO1 PCIe Port 2)

This item configures the PCI-E port Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IIO1 Port 2A Link Speed

This item configures the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s), and **Gen 3 (Generation 3) (8 GT/s).**

IIO1 Port 2C Link Speed

This item configures the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s), and **Gen 3 (Generation 3) (8 GT/s).**

IOU1 (IIO1 PCIe Port 3)

This item configures the PCI-E port Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IIO1 Port 3A Link Speed

This item configures the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s), and **Gen 3 (Generation 3) (8 GT/s).**

▶IIO2 Configuration

IOU2 (IIO2 PCIe Port 1)

This item configures the PCI-E port Bifuraction setting for a PCI-E port specified by the user. The options are x4x4, x8, and **Auto**.

IIO2 Port 1A Link Speed

This item configures the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s), and **Gen 3 (Generation 3) (8 GT/s).**

IOU0 (IIO2 PCIe Port 2)

This item configures the PCI-E port Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IIO2 Port 2A Link Speed

This item configures the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s), and **Gen 3 (Generation 3) (8 GT/s).**

IOU1 (IIO2 PCIe Port 3)

This item configures the PCI-E port Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IIO2 Port 3A Link Speed

This item configures the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s), Gen 2 (Generation 2) (5 GT/s), and **Gen 3 (Generation 3) (8 GT/s).**

▶IOAT Configuration

Enable IOAT

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

No Snoop

Select Enable to support no-snoop mode for each CB device. The options are **Disable** and Enable.

Relaxed Ordering

Select Enable for relaxed ordering support, which will allow certain transactions to be processed and completed prior to other transactions that have already been queued by overriding the strict ordering rules of PCI processing. The options are **Disable** and Enable.

▶Intel VT for Directed I/O (VT-d)

Intel VT for Directed I/O (VT-d)

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

Interrupt Remapping

Select Enable for Interrupt Remapping support to enhance system performance. The options are **Enable** and Disable.

▶QPI (Quick Path Interconnect) Configuration

▶QPI General Configuration

▶QPI Status

The following information will display:

- Number of CPU
- Number of II0
- Current QPI Link Speed
- Current QPI Link Frequency
- QPI Global MMIO Low Base/Limit
- QPI Global MMIO High Base/Limit
- QPI PCIe Configuration Base/Size

Link Frequency Select

Use this item to select the desired frequency for QPI Link connections. The options are 6.4GB/s, 8.0GB/s, 9.6GB/s, **Auto,** and Auto Limited.

Link L0p Enable

Select Enable for Link L0p support to reduce power consumption. The options are **Enable** and Disable.

Link L1 Enable

Select Enable for Link L1 support to reduce power consumption. The options are **Enable** and Disable.

Early Snoop (Available when the OS and the CPU support this feature)

Select Enable for Early Snoop support to enhance system performance. The options are Enable, Disable, and **Auto**.

Home Dir Snoop with IVT-Style OSB (Available when the OS and the CPU support this feature)

Select Enable for Home-Direct Snoop with IVT-Style_OSB support to enhance system performance. The options are Enable, Disable, and **Auto**.

Isoc Mode

Select Enable for Isochronous support to meet QoS (Quality of Service) requirements. This feature is especially important for Intel's Virtualization Technology. The options are Enable and **Disable**.

▶Memory Configuration

This submenu allows the user to configure Integrated Memory Controller (IMC) settings.

Enforce POR

Select Enabled to enforce POR restrictions on DDR4 frequency and voltage programming. The options are **Enabled** and Disabled.

Memory Frequency

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 1333, 1400, 1600, 1800, 1867, 2000, 2133, 2200, and 2400.

Data Scrambling

Select Enabled to enable data scrambling to enhance system performance and data integrity. The options are **Auto**, Disabled and Enabled.

DRAM RAPL (Running Average Power Limit) Baseline

Use this feature to set the run-time power-limit baseline for DRAM modules. The options are Disable, DRAM RAPL Mode 0, and **DRAM RAPL Mode 1**.

Set Throttling Mode

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

A7 Mode

Select Enable to support A7 (Addressing) mode to improve memory performance. The options are **Enable** and Disable.

▶DIMM Information

This item displays the status of a DIMM module as detected by the AMI BIOS.

- P1 DIMMA1 ~ P2 DIMMH3

▶ Memory RAS (Reliability_Availability_Serviceability) Configuration

Use this submenu to configure the following Memory RAS settings.

RAS Mode

When Independent is selected, all memory modules operate independently. When Mirror is selected, the motherboard maintains two identical copies of all data in memory for data backup. When Lockstep is selected, the motherboard uses two areas of memory to run the same set of operations in parallel to boost performance. The options are **Independent**, Mirror, and Lockstep Mode.

Memory Rank Sparing

Select Enable to enable memory-sparing support for memory ranks to improve memory performance. The options are **Disabled** and Enabled.

Patrol Scrub

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

Patrol Scrub Interval

This feature allows you to decide how many hours the system should wait before the next complete patrol scrub is performed. Use the keyboard to enter a value from 0-24. The Default setting is **24**.

Demand Scrub

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

Device Tagging

Select Enable to support device tagging. The options are **Disable** and Enable.

▶South Bridge Configuration

The following South Bridge information will display:

▶USB Configuration

- USB Module Version
- USB Controllers
- USB Devices

Legacy USB Support

Select Enabled to support onboard legacy USB devices. Select Auto to disable legacy support when there are no legacy USB devices present. Select Disabled to have all USB devices available for EFI applications only. The options are **Enabled**, Disabled and Auto.

XHCI Hand-Off

This is a work-around solution for operating systems that do not support XHCI (Extensible Host Controller Interface) hand-off. The XHCI ownership change should be claimed by the XHCI driver. The settings are **Enabled** and Disabled.

EHCI Hand-Off

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

Port 60/64 Emulation

Select Enabled to support I/O port 60h/64h emulation, which will provide complete legacy USB keyboard support for the operating systems that do not support legacy USB devices. The options are Disabled and **Enabled**.

USB 3.0 Support

Select Enabled for USB 3.0 support. The options are Smart Auto, Auto, Enabled, and **Disabled**.

EHCI1

Select Enabled to enable EHCI (Enhanced Host Controller Interface) support on USB 2.0 connector #1 (-at least one USB 2.0 connector should be enabled for EHCI support.) The options are Disabled and **Enabled**.

EHCI2

Select Enabled to enable EHCI (Enhanced Host Controller Interface) support on USB 2.0 connector #2 (-at least one USB 2.0 connector should be enabled for EHCI support.) The options are Disabled and **Enabled**.

XHCI Pre-Boot Driver

Select Enabled to load Intel XHCI pre-boot driver. The settings are **Enabled** and Disabled.

▶sSATA Configuration

When this submenu is selected, AMI BIOS automatically detects the presence of the s-SATA devices that are supported by the PCH-sSATA controller and displays the following items:

sSATA Controller

This item enables or disables the onboard SATA controller supported by the Intel PCH chip. The options are **Enabled** and Disabled.

Configure sSATA as

Select IDE to configure an sSATA drive specified by the user as an IDE drive. Select AHCI to configure an sSATA drive specified by the user as an AHCI drive. Select RAID to configure an sSATA drive specified by the user as a RAID drive. The options are IDE, **AHCI**, and RAID.

**If the item above "Configure sSATA as" is set to AHCI, the following items will display:*

sSATA AHCI ALPM

Select Enabled for the sSATA controller to automatically generate link requests in partial or slumber mode when there is no commands for the system to execute. The options are Disabled, and **Enabled**.

sSATA Port 0~ Port 3

This item displays the information detected on the installed on the sSATA port, specified by the user.

- Model number of drive and capacity

sSATA Port 0~ Port 3

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

sSATA Port 0 ~ Port 3 Hot Plug

Select Enabled to enable hot-plugging support for a port specified by the user, which will allow the user to replace a sSATA disk drive installed on this port without shutting down the system. The options are **Enabled** and Disabled.

sSATA Port 0 ~ Port 3 Spin Up Device

On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRESET initialization to the device. The options are Enabled and **Disabled**.

Port 0 ~ Port 3 sSATA Device Type

Use this item to specify if the sSATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

**If the item above "Configure sSATA as" is set to IDE, the following items will display:*

sSATA Port 0~ Port 3

This item indicates that an sSATA port specified by the user is installed (present) or not.

Port 0~ Port 3 sSATA Device Type (Available when a sSATA port is detected)

Use this item to specify if the sSATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

**If the item above "Configure sSATA as" is set to RAID, the following items will display:*

sSATA AHCI ALPM

Select Enabled for the sSATA controller to automatically generate link requests in partial or slumber mode when there is no commands for the system to execute. The options are Disabled, and **Enabled**.

sSATA RAID Option ROM/UEFI Driver

Select EFI to load the EFI driver for system boot. Select Legacy to load a legacy OPROM for system boot. The options are Disabled, EFI, and **Legacy.**

SATA/sSATA RAID Boot Select

Select SATA Controller to boot the system from a SATA RAID device. Select sSATA Controller to boot the system from a sSATA RAID device. Select Both to boot the system either from a SATA RAID device or from an sSATA RAID device. Please note that the option-Both is not supported by the Windows Server 2012/R2 OS. The options are Both, SATA Controller, and **sSATA Controller**.

sSATA Port 0 ~ Port 3 Hot Plug

Select Enabled to enable hot-plugging support for a port specified by the user, which will allow the user to replace a sSATA disk drive installed on this port without shutting down the system. The options are **Enabled** and Disabled.

sSATA Port 0 ~ Port 3 Spin Up Device

On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRESET initialization to the device. The options are Enabled and **Disabled**.

Port 0 ~ Port 3 sSATA Device Type

Use this item to specify if the sSATA port specified by the user should be connected to a Solid State drive or a Hard Disk Drive. The options are **Hard Disk Drive** and Solid State Drive.

▶Server ME (Management Engine) Configuration

This feature displays the following system ME configuration settings.

- General ME Configuration
- Operational Firmware Version
- ME Firmware Type
- Recovery Firmware Version
- ME Firmware Features
- ME Firmware Status #1
- ME Firmware Status #2
  - Current State
  - Error Code

▶PCIE/PCI/PnP Configuration

The following items will display:

- PCI Bus Driver Version
- PCI Devices Common Settings

PCI PERR/SERR Support

Select Enabled to support PERR (PCI/PCI-E Parity Error)/SERR (System Error) runtime error reporting for a PCI/PCI-E slot. The options are Enabled and **Disabled**.

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

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

SR-IOV (Available if the system supports Single-Root Virtualization)

Select Enabled for Single-Root IO Virtualization support. The options are Enabled and **Disabled.**

Maximum Payload

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

Maximum Read Request

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

ASPM Support

Use this item to set the Active State Power Management (ASPM) level for a PCI-E device. Select Auto for the system BIOS to automatically set the ASPM level based on the system configuration. Select Disabled to disable ASPM support. The options are **Disabled** and Auto.

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

MMIOHBase

Use this item to select the I/O base memory size according to memory-address mapping for the PCH chip. The base memory size must be between 4032G to 4078G. The options are **56TB**, 40TB, 24T, 3T, 2T, and 1TB.

MMIO High Size

Use this item to select the high I/O memory size according to memory-address mapping for the PCH chip. The options are **256G**, 128G, 512G, and 1024G.

PCI Devices Option ROM Settings

CPU2 PCI-E 3.0x8 Slot1 OPROM/CPU2 PCI-E 3.0x16 Slot2 OPROM/CPU2 PCI-E 3.0x16 Slot3 OPROM/CPU1 SAS AOM1 (Add-On Module#1) Slot4 OPROM/CPU1 SIOM Card Slot5 OPROM

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

Onboard NVMe1 Option ROM/Onboard NVMe2 Option ROM/Onboard Video Option ROM

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

VGA Priority

Use this item to select the graphics device to be used as the primary video display for system boot. The options are **Onboard** and Offboard.

Onboard LAN1 Option ROM/Onboard LAN2 Option ROM

Use this option to select the type of device installed in LAN Port1 or LAN Port2 for system boot. The default setting for LAN1 Option ROM is **PXE**, and for LAN2 Option ROM is **Disabled**.

Network Stack

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

IPv4 PXE Support (Available when Network Stack is set to Enabled)

Set this item to Enabled to activate IPv4 PXE Support. The options are **Enabled** and Disabled.

IPv6 PXE Support (Available when Network Stack is set to Enabled)

Set this item to Enabled to activate IPv6 PXE Support. The options are Enabled and **Disabled**.

▶Super IO Configuration

Super IO Chip AST2400

▶Serial Port 1 Configuration

Serial Port 1

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

Device Settings

This item displays the base I/O port address and the Interrupt Request address for a serial port specified by the user. The default setting for Serial Port 1 is IO=3F8h IRQ=4.

Change Port 1 Settings

This feature specifies the base I/O port address and the Interrupt Request address of Serial Port 1. Select **Auto** for the BIOS to automatically assign the base I/O and IRQ address to a serial port specified.

The options for Serial Port 1 are **Auto**, (IO=3F8h; IRQ=4), (IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12); (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12), and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12).

▶Serial Port Console Redirection

COM 1

COM 1 Console Redirection

Select Enabled to enable COM Port 1 Console Redirection, which will allow a client machine to be connected to a host machine at a remote site for networking. The options are **Disabled** and Enabled.

**If the item above set to Enabled, the following items will become available for configuration:*

▶COM 1 Console Redirection Settings

Terminal Type

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

Bits Per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

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

Putty KeyPad

Use this item to select Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

Redirection After BIOS Post

Use this item to enable or disable legacy Console Redirection after BIOS POST (Power-On Self-Test). When "Bootloader" is selected, legacy Console Redirection is disabled before booting the OS. When "Always Enable" is selected, legacy Console Redirection remains enabled while the OS boots up. The options are **Always Enable** and Bootloader.

SOL

SOL Console Redirection

Select Enabled to use the SOL port for Console Redirection. The options are **Enabled** and Disabled.

**If the item above set to Enabled, the following items will become available for user's configuration:*

▶SOL Console Redirection Settings

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

Terminal Type

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

Bits Per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

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

Putty KeyPad

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

Redirection After BIOS Post

Use this feature to enable or disable legacy Console Redirection after BIOS POST (Power-On Self-Test). When this feature is set to Bootloader, legacy Console Redirection is disabled before booting the OS. When this feature is set to Always Enable, legacy Console Redirection remains enabled upon OS boot. The options are **Always Enable** and Bootloader.

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

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

(EMS) Console Redirection

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

*If the item above set to Enabled, the following items will become available for user's configuration:

▶EMS Console Redirection Settings (Available when EMS Console Redirection is enabled)

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

Out-of-Band Management Port

The feature selects a serial port in a client server to be used by the Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are **COM1 (Console Redirection)** and SOL (Console Redirection).

Terminal Type

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

Bits Per Second

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

Flow Control

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

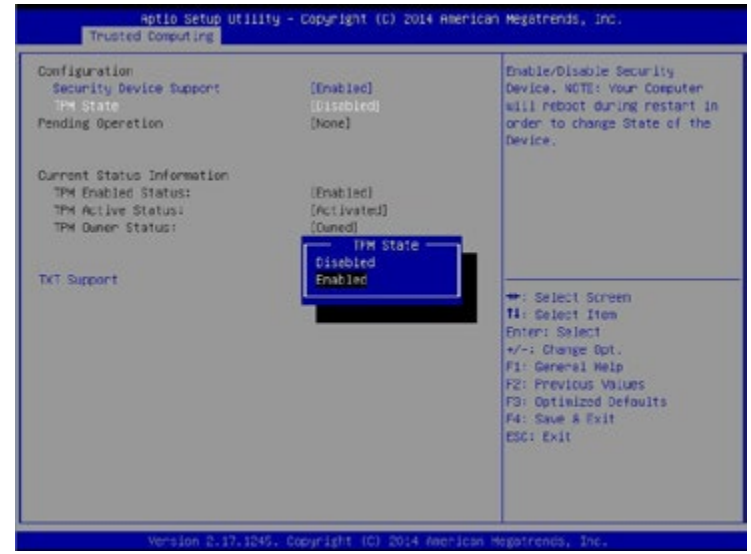
The following settings will be displayed:

Data Bits, Parity, Stop Bits

▶Enabling TPM in the BIOS

The steps below describe the proper procedure on how to enable the TPM in the BIOS. This process is necessary to activate support in the system before you can start using the TPM.

1. Enter the BIOS setup screen. You may do this either from the IPMI remote console or from the server directly using KVM. Reboot the system and press the <Del> key as the system boots until you reach the BIOS screen.
2. You will be presented with the BIOS setup main screen. Using the arrow keys, navigate to the Advanced tab. From there, navigate down and select the "CPU Configuration" option as shown below. Press <Enter>.



3. You will be taken to the CPU Configuration page. Using the arrow keys, navigate down to the "Intel Virtualization Technology" option and press <Enter>. Select "Enable" and press <Enter>.
4. Once you have enabled Virtualization support, press your <Esc> key until you are back to the Advanced tab. Navigate down to the "Trusted Computing" option and press <Enter>.
5. The Trusted Computing window will appear. Select "TPM State" and press <Enter>.
6. From the window that pops up, select "Enabled" and press <Enter>.
7. You must save your changes and reset for the changes to take effect. Scroll to the Save & Exit tab and select "Save Changes and Reset."

▸Intel TXT (LT-SX) Configuration

This submenu allows the user to configure the following TXT settings.

TXT Support

Select Enabled to enable Intel Trusted Execution Technology (TXT) support. The options are **Disabled** and Enabled.

> **Note**: If the option for this item (TXT Support) is set to Enabled, be sure to disable EV DFX (Device Function On-Hide) support for the system to work properly. (EV DFX is under "IIO Configuration" in the "Chipset/North Bridge" submenu on Page 4-10). For more information on TPM, please refer to the TPM manual at http://www.supermicro.com/manuals/other/AOM-TPM-9655V_9655H.pdf

▸ACPI Settings

WHEA Support

Select Enabled to support the Windows Hardware Error Architecture (WHEA) platform and provide a common infrastructure for the system to handle hardware errors within the Windows OS environment to reduce system crashes and to enhance system recovery and health monitoring. The options are **Enabled** and Disabled.

High Precision Event Timer

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

NUMA (Available when the OS supports this feature)

Select Enabled to enable Non-Uniform Memory Access support to enhance system performance. The options are **Enabled** and Disabled.

▶iSCSI Configuration

This item displays iSCSI configuration information:

iSCSI Initiator Name

Use this item to enter the name of the iSCSI Initiator, which is a unique name used in the world. The name must in the IQN format. The following submenu will be available for configuration:

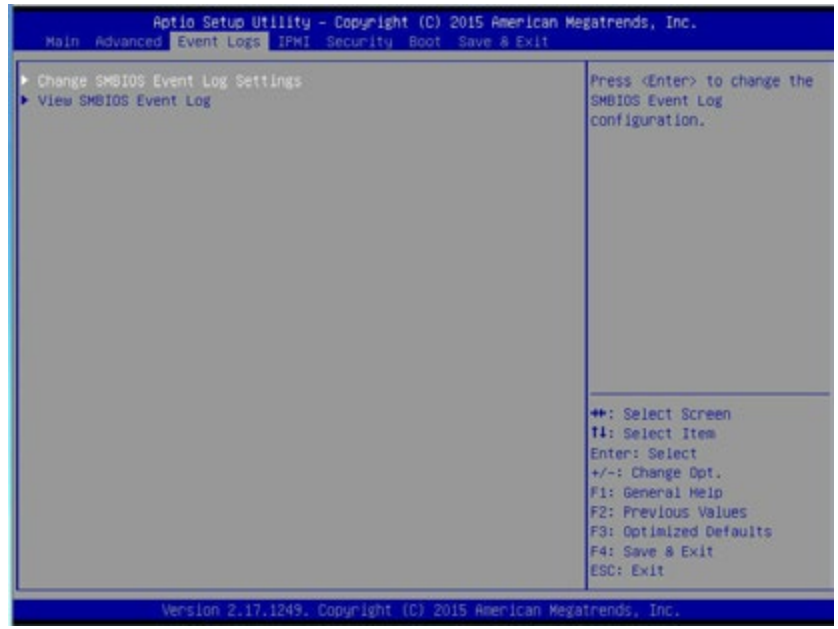
▶Add an Attempt

▶Delete Attempts

▶Change Attempt Order

7-4 Event Logs

This submenu allows the user to configure Event Log settings.



▶Change SMBIOS Event Log Settings

This feature allows the user to configure SMBIOS Event settings.

Enabling/Disabling Options

SMBIOS Event Log

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

Runtime Error Logging Support

Select Enable to support Runtime Error logging. The options are **Enabled** and Disabled. If this item is set to Enabled, the following item will be available for configuration:

Erasing Settings

Erase Event Log

Select Yes to erase all error events in the SMBIOS (System Management BIOS) log before an event logging is initialized at bootup. The options are **No**, Yes, Next reset, and Yes, every reset.

When Log is Full

Select Erase Immediately to immediately erase all errors in the SMBIOS event log when the event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings

Log System Boot Event

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

MECI (Multiple Event Count Increment)

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

METW (Multiple Event Count Time Window)

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

Note: Please reboot the system for the changes to take effect.

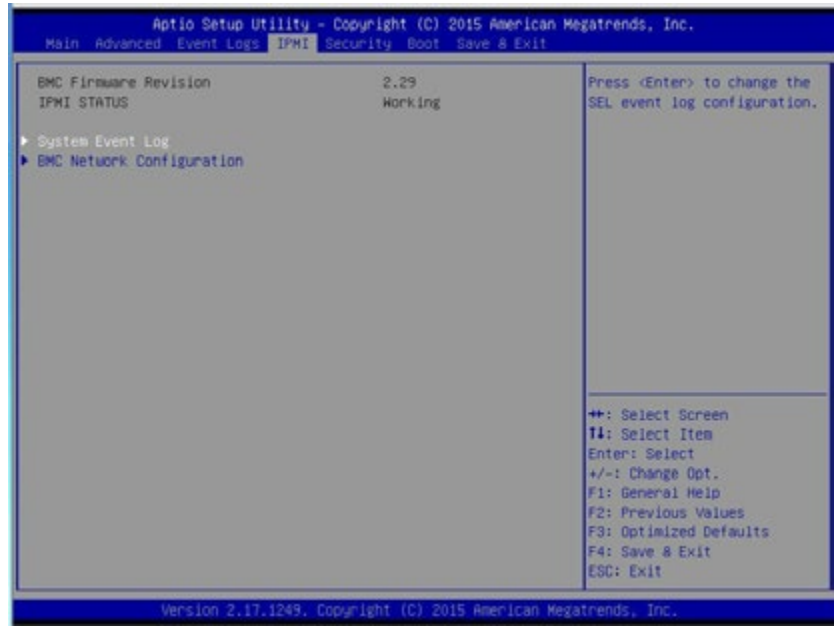
▶View SMBIOS Event Log

This item allows the user to view the event in the SMBIOS event log. The following categories are displayed:

Date/Time/Error Code/Severity

7-5 IPMI

This submenu allows the user to configure IPMI settings.



The following items will be displayed:

- BMC (Baseboard Management Controller) Firmware Revision
- IPMI Status

▶System Event Log

Enabling/Disabling Options

SEL Components

Select Enabled to enable all system event logging support at bootup. The options are **Enabled** and Disabled.

Erasing Settings

Erase SEL

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

When SEL is Full

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

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

▶BMC Network Configuration

The following items will be displayed:

- IPMI LAN Selection
- IPMI Network Link Status

Update IPMI LAN Configuration

Select Yes for the system BIOS to automatically reset the following IPMI settings upon next system boot. The options are Yes and **No**.

Configuration Address Source (Available when the item above - Update IPMI LAN Configuration is set to Yes)

Use this item to select the IP address source for this computer. If Static is selected, you will need to know the IP address of this computer and enter it to the system manually in the field. If DHCP is selected, AMI BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server attached to the network and request the next available IP address for this computer. The options are **DHCP** and Static.

Station IP Address

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

Subnet Mask

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

Station MAC Address

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

Gateway IP Address

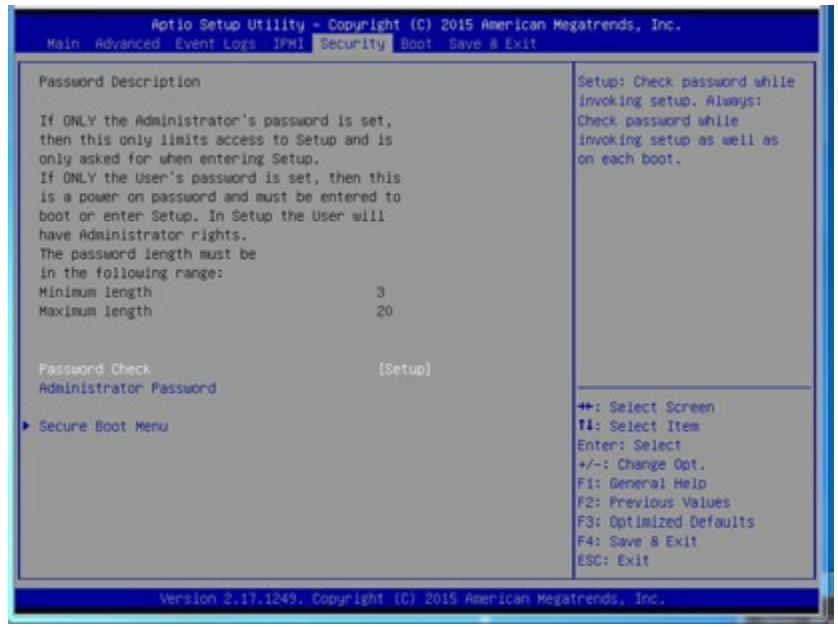
This item displays the Gateway IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

VLAN

Select Enabled to enable onboard LAN connections to be used for Intel Virtualization Technology. The options are Enable and **Disable.**

7-6 Security Settings

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



Password Check

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

Administrator Password

Use this feature to set the administrator password which is required before entering the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

User Password (Available after an Administrator Password is entered)

Use this feature to set the user password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

▶Secure Boot Menu

The following items will display:

- System Mode
- Secure Boot
- Vendor Keys

Secure Boot

Select Enable for secure boot support to ensure system security at bootup. The options are Enabled and **Disabled.**

Secure Boot Mode

This item allows the user to select the desired secure boot mode for the system. The options are Standard and **Custom**.

CSM Support

Select Enabled to support Compatibility Support Module (CSM) to enhance system security. The options are **Enabled** and Disabled.

▶Key Management

Provision Factory Default Keys

Select Enable to install all manufacturer default keys for the following system security settings. The options are **Disabled** and Enabled.

▶Enroll All Factor Default Keys

Select Enable to install all manufacturer defaults for the following system security settings. The options are **Yes** and No.

▶Save All Secure Boot Variables

This feature allows the user to set and save the following Secure Boot Variable settings:

▶Platform Key (PK)

This feature allows the user to configure and save platform key settings.

▶Key Exchange Key

This feature allows the user to configure and save Key-Exchange-Key settings.

▶Authorized Signatures

This feature allows the user to set and save authorized signatures and grant access to those whose names appear on the list.

▶Forbidden Signatures

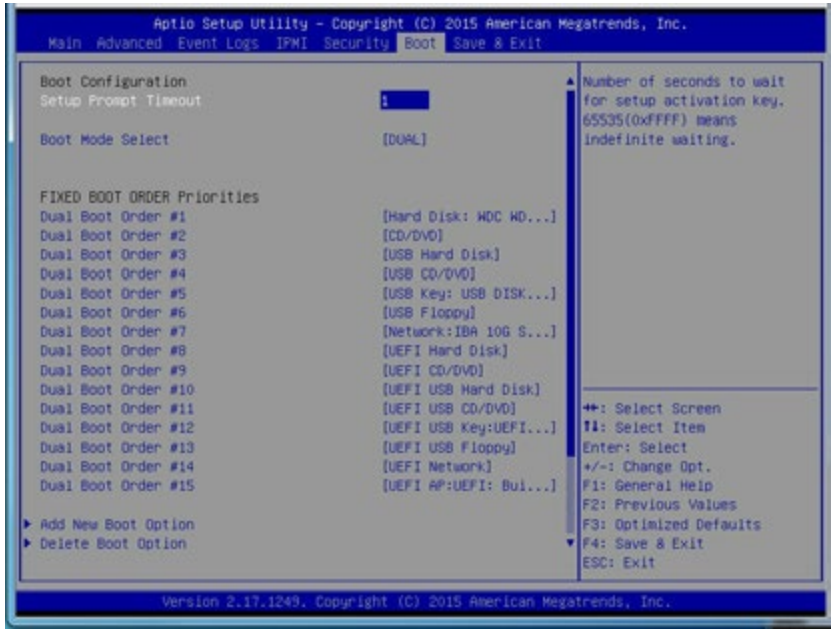
This feature allows the user to set and save the forbidden signatures and deny the access to those whose names appear on the list.

▶Authorized TimeStamps

This feature allows the user to set and save the timestamps for authorized signatures to indicate when these signatures were entered into the system.

7-7 Boot Settings

This submenu allows the user to configure Boot settings for this system:



Boot Configuration

Setup Prompt Timeout

Use this item to enter the number of seconds for the system to wait for the setup activation key before entering the Setup utility. Enter 65535 (0xFFFF) to wait indefinitely.

Boot Mode Select

Use this item to select the type of device to be used for system boot. The options are Legacy, UEFI, and **Dual.**

Fixed Boot Order Priorities

This option prioritizes the order of bootable devices from which the system will boot. Press <Enter> on each entry from top to bottom to select devices.

When the item above -"Boot Mode Select" is set to **Dual** (default), the following items will be displayed for configuration:

- Boot Option #1 - Boot Option #15

When the item above -"Boot Mode Select" is set to Legacy, the following items will be display for configuration:

- Boot Option #1 - Boot Option #7

When the item above -"Boot Mode Select" is set to UEFI, the following items will be display for configuration:

- Boot Option #1 - Boot Option #8

▶Add New Boot Option

Use this item to select a new boot device to add to the boot priority list.

Add New Boot Option

Use this feature to select the target boot device to add to the boot priority list.

Path for Boot Option

Use this feature to create a new path for boot option.

Boot Option File Path

Use this feature to set a new file path for boot option.

Create

Use this feature to create a new boot option for the new device.

▶Delete Boot Option

Use this item to select a boot device to delete from the boot priority list.

Delete Boot Option

Select the target boot device to delete from the boot priority list.

▶Hard Disk Drive BBS Priorities

- Legacy Boot Order #1

▶Network Drive BBS Priorities

- Legacy Boot Order #1 - # 8

▶USB Key Drive BBS Priorities

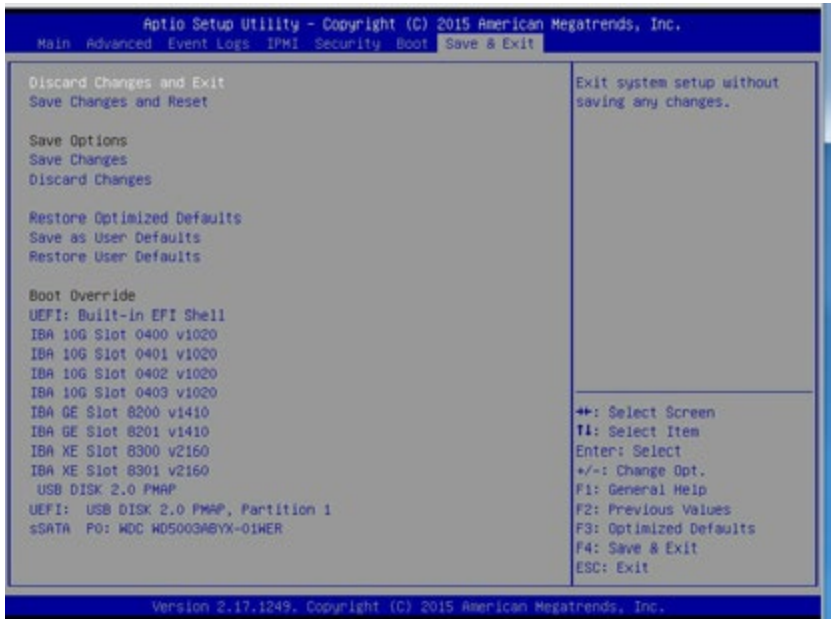
- Legacy Boot Order #1

▶UEFI USB Key Drive BBS Priorities

- UEFI Boot Order #1

7-8 Save & Exit

This submenu allows the user to configure the following Save & Exit settings:



Discard Changes and Exit

Select this item to exit from the BIOS setup without making any permanent changes to the system configuration, and reboot the computer.

Save Changes and Reset

When you have completed the system configuration changes, select this item to leave the BIOS setup utility and reboot the computer for the new system configuration parameters to take effect. Select Yes and press <Enter> to save the changes you've made and reboot the system.

Save Options

Save Changes

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

Discard Changes

Select this item to discard all the changes and return to the AMI BIOS setup utility. Select Yes and press <Enter> to discard all changes made.

Restore Defaults

Select this item and press <Enter> to load the manufacture default settings which are designed for maximum system performance but not for maximum stability.

Save As User Defaults

Select this item and press <Enter> to save the current BIOS settings as user's default settings for future use.

Restore User Defaults

Select this item and press <Enter> to retrieve the user-defined default settings that were previously saved to be used as current default settings.

Boot Override

This feature allows the user to override the boot priority sequence in the Boot submenu and immediately boot the system with another device specified by the user. This is a one-time override.

Notes

Appendix A

BIOS POST Error Codes

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

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

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

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

BIOS POST Error Beep Codes

Beep Code/LED	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
5 long beeps + 2 short beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep	System OH	System overheat

Notes

Appendix B

System Specifications

Processors

The system supports dual E5-2600 v3/v4 series processors in two Socket R3-LGA 2011 sockets.

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

Chipset

C612

BIOS

128 Mb SPI AMI BIOS SM Flash BIOS

Memory Capacity

The system has sixteen (16) DIMM slots that can support up to 1 TB RDIMM or 2 TB 3DS LRDIMM of DDR4 (288-pin) ECC 2400/2133/1866/1600 MHz speed memory at 1.2v voltage. Modules of the same size and speed are recommended. DIMM sizes of 4 GB, 8 GB, 16 GB, 32 GB, 64 GB, 128 GB (3DS LRDIMM only) size are supported See Chapter 5 for details.

SATA Controller

The system supports two (2) SATA 3.0 connectors that support Super DOMs (with power pins built-in) (S-SATA 0/1). The system supports RAID 0, 1, 5 and 10.

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

Drive Bays

The system has space for twenty-four (24) hot-swap drive bays.

Expansion Slots

The motherboard has the following PCI-E slots available on the serverboard:

- One (1) PCI-Express 3.0 x16 low-profile slot
- One (1) PCI-Express 3.0 x8 low-profile slot
- One (1) SIOM slot

Serverboard

X10DSN-TS (Proprietary form factor)
Dimensions: (LxW) 13.85" x 11.80" (351.79 mm x 299.72 mm)

Chassis

SC227TS-R2K05P2 (2U rackmount)
Dimensions: (WxHxD) 17.2 x 3.5 x 25.25 in. (437 x 89 x 641 mm)

Weight

Gross Weight: 67 lbs (30.4 kg)

System Cooling

The system has five (5) 8-cm behind the HDD backplane and Two (2) 4-cm counter-rotating fans at the rear of each node.

System Input Requirements

AC Input Voltage: 200-240 VAC
Rated Input Current: 11.8-9.8A
Rated Input Frequency: 50 to 60 Hz

Note: System power redundancy provided at 240V only.

Power Supply

Rated Output Power: 2000W (Part# PWS-2K05A-1R) 80+ Titanium Certified
Rated Output Voltages: +12V (164.68A max.), +12Vsb (2.07A max.)

Operating Environment

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

Regulatory Compliance

Electromagnetic Emissions: FCC Class A, EN 55032 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A
Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)
California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

Notes

(continued from front)

The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.

Appendix C

UEFI BIOS Recovery Instructions

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 need to update the BIOS, do not shut down or reset the system while the BIOS is updating to avoid possible boot failure.

C-1 An Overview to the UEFI BIOS

The Unified Extensible Firmware Interface (UEFI) provides a software-based interface between the operating system and the platform firmware in the pre-boot environment. The UEFI specification supports an architecture-independent mechanism for add-on card initialization to allow the UEFI OS loader, which is stored in the add-on card, to boot the system. The UEFI offers a clean, hands-off control to a computer system at bootup.

C-2 How to Recover the UEFI BIOS Image (-the Main BIOS Block)

A UEFI BIOS flash chip consists of a recovery BIOS block and a main BIOS block (a main BIOS image). The boot block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a new BIOS image if the original main BIOS image is corrupted. When the system power is on, the boot block codes execute first. Once it is completed, the main BIOS code will continue with system initialization and bootup.

Note: Follow the BIOS recovery instructions below for BIOS recovery when the main BIOS boot crashes.

C-3 To Recover the Main BIOS Block Using a USB-Attached Device

This feature allows the user to recover a BIOS image using a USB-attached device without additional utilities used. A USB flash device such as a USB Flash Drive, or a USB CD/DVD ROM/RW device can be used for this purpose. However, a USB Hard Disk drive cannot be used for BIOS recovery at this time.

The file system supported by UEFI is FAT (including FAT12, FAT16, and FAT32) installed on a bootable or non-bootable USB-attached device. However, the BIOS might need several minutes to locate the SUPER.ROM file if the media size becomes too large because it contains too many folders and files.

To perform UEFI BIOS recovery using a USB-attached device, follow the instructions below.

1. Using a different machine, copy the "Super.ROM" binary image file into the disc Root "\" Directory of a USB device or a writeable CD/DVD.

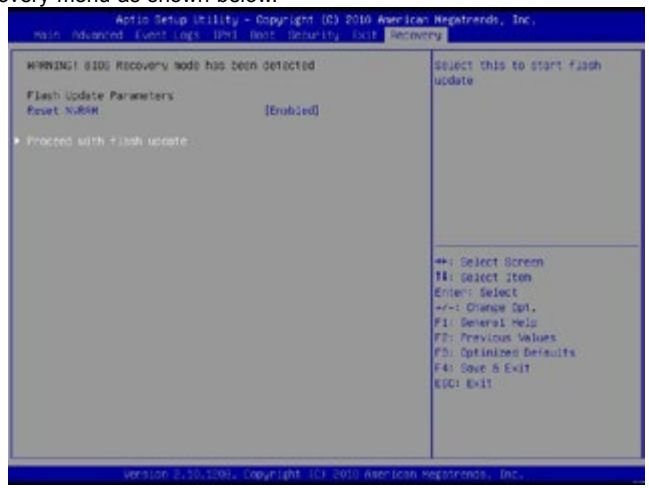
Note: If you cannot locate the "Super.ROM" file in your driver disk, visit our website at www.supermicro.com to download the BIOS image into a USB flash device and rename it "Super.ROM" for BIOS recovery use.

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB drive and power on the system

Warning!! Please **stop** pressing the <Ctrl> and <Home> keys immediately when you see the screen (or a similar screen) below; otherwise, it will trigger a system reboot.

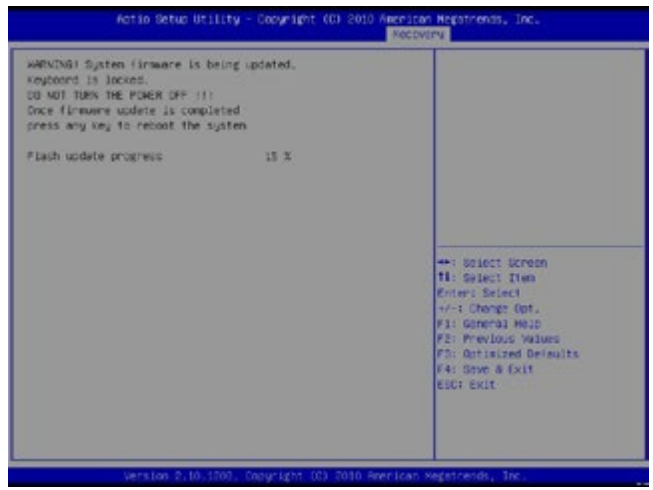
Note: On the other hand, if the following screen displays, please load the "Super.ROM" file to the root folder and connect this folder to the system. (You can do so by inserting a USB device that contains the new "Super.ROM" image to your machine for BIOS recovery.)

3. While powering on the system, please keep pressing <Ctrl> and <Home> simultaneously on your keyboard *<u>until</u> the following screen (or a screen similar to the one below) displays*.
4. After locating the new BIOS binary image, the system will enter the BIOS Recovery menu as shown below.

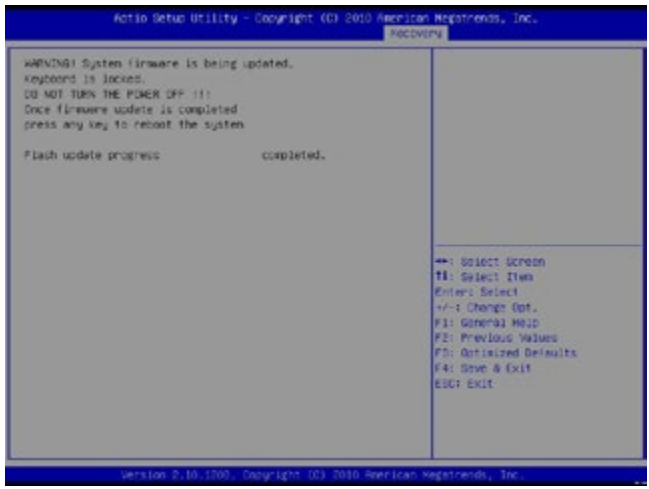


Note: At this point, you may decide if you want to start with BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.

5. When the screen as shown above displays, using the arrow key, select the item "Proceed with flash update" and press the <Enter> key. You will see the progress of BIOS recovery as shown in the screen below.



Note: *Do not interrupt* the process of BIOS flashing until it is completed.



6. After the process of BIOS recovery is completed, press any key to reboot the system.
7. Using a different system, extract the BIOS package into a bootable USB flash drive.
8. When a DOS prompt appears, enter FLASH.BAT BIOSname.### at the prompt.

Note: *Do not interrupt this process* until BIOS flashing is completed.

9. After seeing the message that BIOS update is completed, unplug the AC power cable from the power supply to clear the CMOS, and then plug the AC power cable in the power supply again to power on the system.
10. Press <Del> continuously to enter the BIOS Setup utility.
11. Press <F3> to load default settings.
12. After loading default settings, press <F4> to save the settings and exit the BIOS Setup utility.