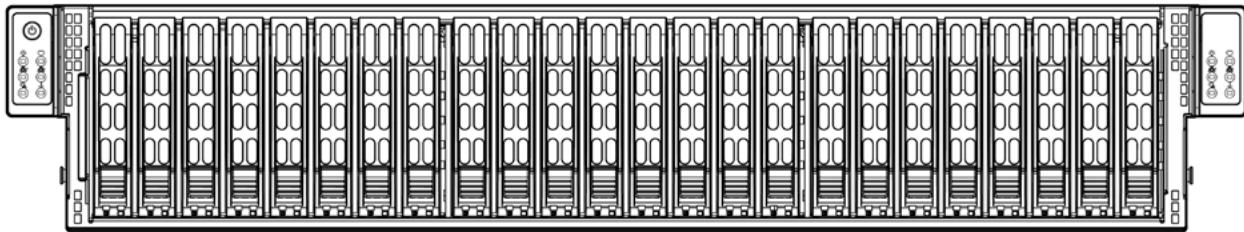




# SUPERSTORAGE SERVER

## 2029P-DN2R24L



USER'S MANUAL

Revision 1.0b

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Manual Revision 1.0b

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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 FatTwin 2029P-DN2R24L. Installation and maintenance should be performed by experienced technicians only.

Please refer to the 2029P-DN2R24L server specifications page on our website for updates on supported memory, processors and operating systems (<https://www.supermicro.com>).

### Notes

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: <https://www.supermicro.com/wdl/>
- Product safety info: [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm)

If you have any questions, please contact our support team at:  
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This manual may be periodically updated without notice. Please check the Supermicro website for possible updates to the manual revision level.

### Secure Data Deletion

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### Warnings

Special attention should be given to the following symbols used in this manual.



**Warning!** Indicates important information given to prevent equipment/property damage or personal injury.



**Warning!** Indicates high voltage may be encountered when performing a procedure.

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# Chapter 1

## Introduction

### 1.1 Overview

This chapter provides a brief outline of the functions and features of the SuperStorage Server 2029P-DN2R24L. The 2029P-DN2R24L is a high-end solution comprised of two main subsystems: the SC227TS-R2K05P3 2U chassis and the X11DSN-TS dual processor motherboard. It features hot-swap NVMe drives, and SIOM for networking flexibility. It is powered by dual redundant 2000 Watt high-efficiency, hot-swap power modules.

It is useful for IOPS-intensive storage applications, database applications such as MySQL or Casandra, virtual storage environments, single instance storage and data de-duplication.

In addition to the motherboard and chassis, several important parts that are included with the system are listed below.

Main Parts List		
Description	Part Number	Quantity
1U passive CPU heatsink equipped with a Narrow Retention Mechanism	SNK-P0067PS	4
40x40x56 mm, 23.3K-20.3K RPM, counter-rotating fans	FAN-0163L4	4
80x80x38 mm, 13.5K RPM, middle cooling fans	FAN-0168L4	5
2U, 24-Port, SBB backplane for 24 x 2.5" dual-port NVMe SSDs	BPN-NVME3-227NB	1
2U ,Gen3 PCIe switch daughter board for dual port NVMe SSD	BPN-NVME3-227NL	2
NVMe Platform Mid-plane for power distribution, PCIe pass-through and NTB link with PLX	BPN-NVMe3-227SSB-2	1
Black gen-3 2.5 NVMe drive tray, Orange tab with lock (for hotswap NVMe drive)	MCP-220-00127-0B	24
1U LHS passive storage riser card with 2 PCI-E x16 slots	RSC-X-66-C	2
Rail Set	MCP-290-00142-0N	1
Power Supplies	PWS-2K05A-1R	2

### 1.2 Unpacking the System

Inspect the box the SuperServer 2029P-DN2R24L was shipped in and note if it was damaged in any way. If any equipment appears damaged, please file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the server. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. It will also require a grounded AC power outlet nearby. Be sure to read the precautions and considerations noted in Appendix B.

## 1.3 System Features

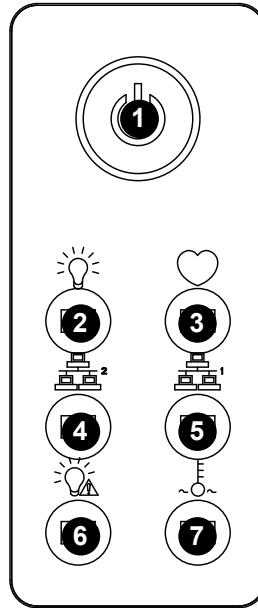
The following table provides you with an overview of the main features of the 2029P-DN2R24L. Please refer to Appendix C for additional specifications.

System Features	
<b>Motherboard</b>	X11DSN-TS
<b>Chassis</b>	SC227TS-R2K05P3
<b>CPU</b>	<p>The X11DSN-TS motherboard supports dual Intel Xeon 81xx/61xx/51xx/41xx/31xx and 82xx/62xx/52xx/42xx/32xx series (Socket P) processors which offer three Intel® UltraPath Interconnect (UPI) of up to 10.4 GT/s.</p> <p><b>Note:</b> Both CPUs need to be installed for full access to the PCI-E slots, DIMM slots, and onboard controllers. Refer to the block diagram on page 18 to determine which slots or devices may be affected.</p>
<b>Socket Type</b>	Socket P
<b>Memory</b>	<p>The integrated memory controller embedded in the processor supports up to 3 TB of 3DS Load Reduced DIMM (3DS LRDIMM), 3DS Registered DIMM (3DS RDIMM) and NV-DIMM DDR4 (288-pin) ECC memory 2933/2666/2400/2133 Mhz speed modules in up to 12 slots per node.</p>
<b>Chipset</b>	Intel C624 chipset
<b>Expansion Slots</b>	<p>Supports the following expansion slots (per node):</p> <ul style="list-style-type: none"> <li>Two PCI-E 3.0 x16 slots</li> <li>One M.2 slot/connector</li> <li>One SIOM slot</li> </ul>
<b>Internal Node-to-Node Connectivity</b>	<p>One NTB (Non-Transparent Bridge) by PLX PCI-E x8</p> <p>Two 10G private Ethernet</p>
<b>Hard Drives</b>	Up to 24 2.5" dual port hot-swap NVMe drives mounted in the chassis front
<b>Power</b>	Dual 2000 Watt, Titanium Level, redundant power supplies
<b>Cooling</b>	Up to five 8-cm mid-mounted cooling fans and four 4-cm exhaust fans
<b>Dimensions</b>	(WxHxD) 17.2" x 3.5" x 25.6" (437mm x 89mm x 650mm)

## 1.4 Server Chassis Features

### Control Panel

The switches and LEDs located on the control panel are described below. See Chapter 4 for details on the control panel connections.



**Figure 1-1. Control Panel View**

Control Panel Features		
Item	Feature	Description
1	Power Button	The main power button is used to apply or remove power from the power supply to the server. Turning off system power with this button removes the main power but maintains standby power. To perform many maintenance tasks, you must also unplug system before servicing
2	Power LED	Indicates power is being supplied to a system power supply. This LED should normally be illuminated when the system is operating.
3	Heartbeat LED	This is a motherboard heartbeat LED and indicates that power is being supplied to the motherboard.
4	NIC2 LED	Indicates network activity on LAN port 2 when flashing
5	NIC1 LED	Indicates network activity on LAN port 1 when flashing
6	Power Fail LED	Indicates a power supply module has failed.
7	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.

## Front Features

The SC227TS-R2K05P3 is a 2U chassis. See the illustration below for the features included on the front of the chassis.

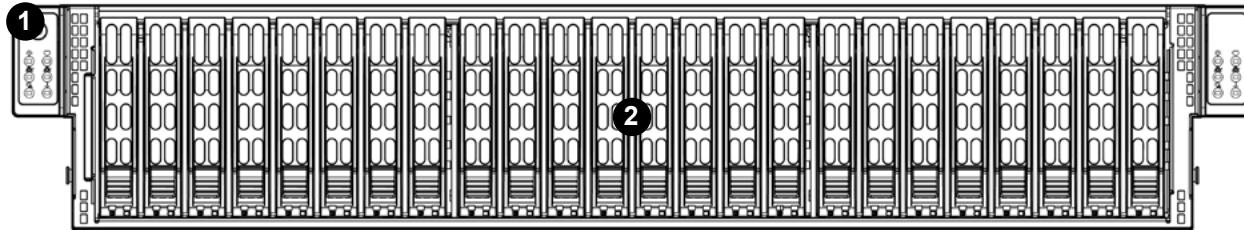


Figure 1-2. Chassis Front View

Front Chassis Features		
Item	Feature	Description
1	Control Panel	Control panel for the server. See Section 1.4 for details.
2	Hard Drive Carriers	Hot-swap hard drive carriers for front mounted hot-swap NVMe drives

## Rear Features

The illustration below shows the features included on the rear of the chassis.

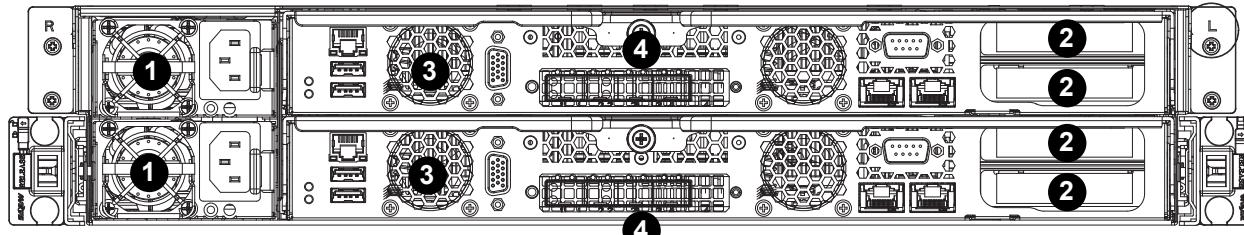


Figure 1-3. Chassis Rear View

Rear Chassis Features		
Item	Feature	Description
1	Power Supplies	Two power supplies are supported in the chassis rear.
2	Expansion Slots	Up to four PCI-E expansion cards are supported in the chassis rear.
3	I/O Ports	The I/O port rear panel is located here. See Chapter 4 for details.
4	SIOM Module	Two SIOM module slots are provided in the chassis rear. See Chapter 3 for details.

**Note:** All graphics shown in this manual were based upon the latest PCB revision available at the time of publication of the manual. The motherboard you received may or may not look exactly the same as the graphics shown in this manual.

## 1.5 Motherboard Layout

Below is a layout of the X11DSN-TS with jumper, connector and LED locations shown. See the table on the following page for descriptions. For detailed descriptions, pinout information and jumper settings, refer to Chapter 4.

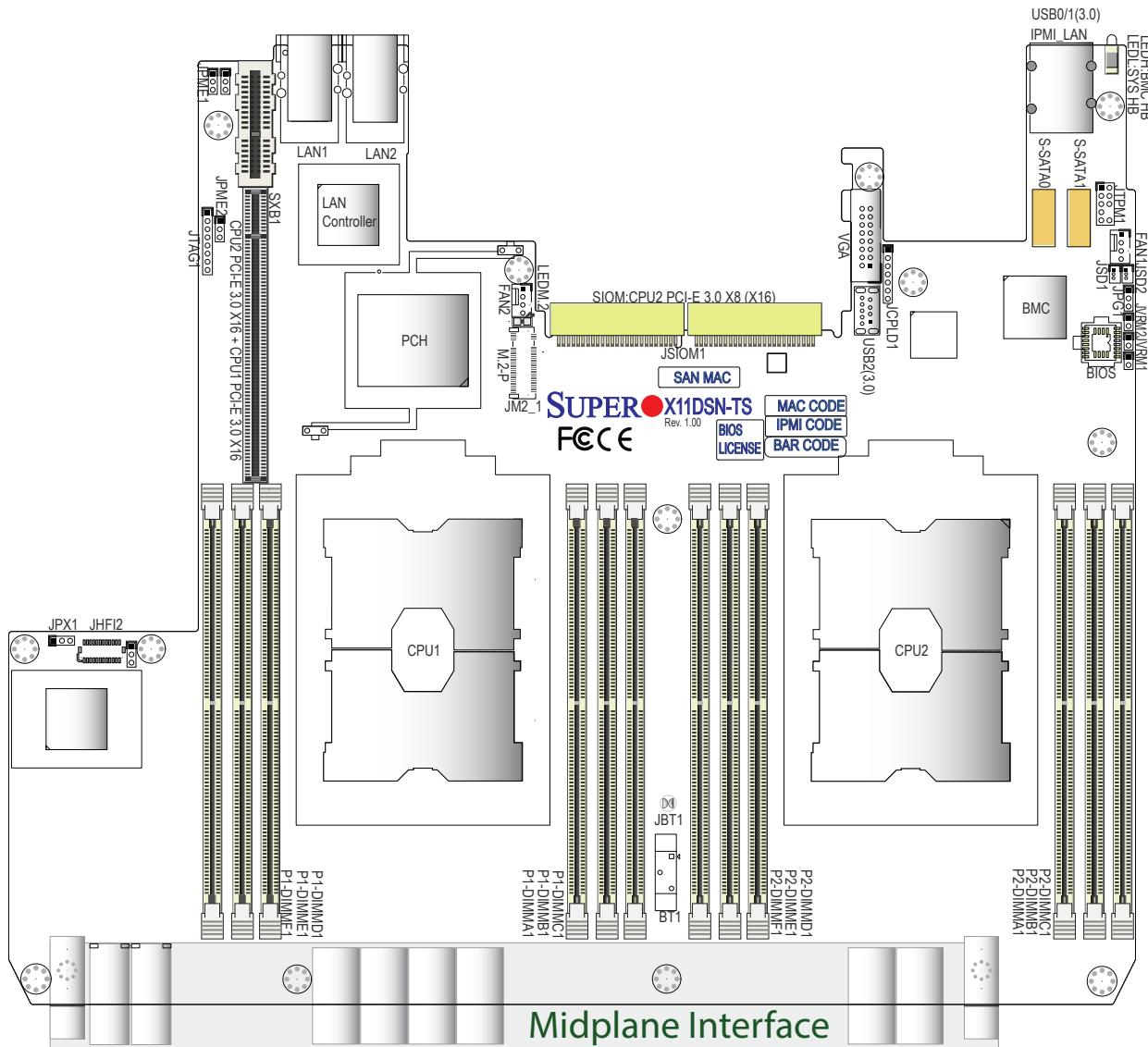


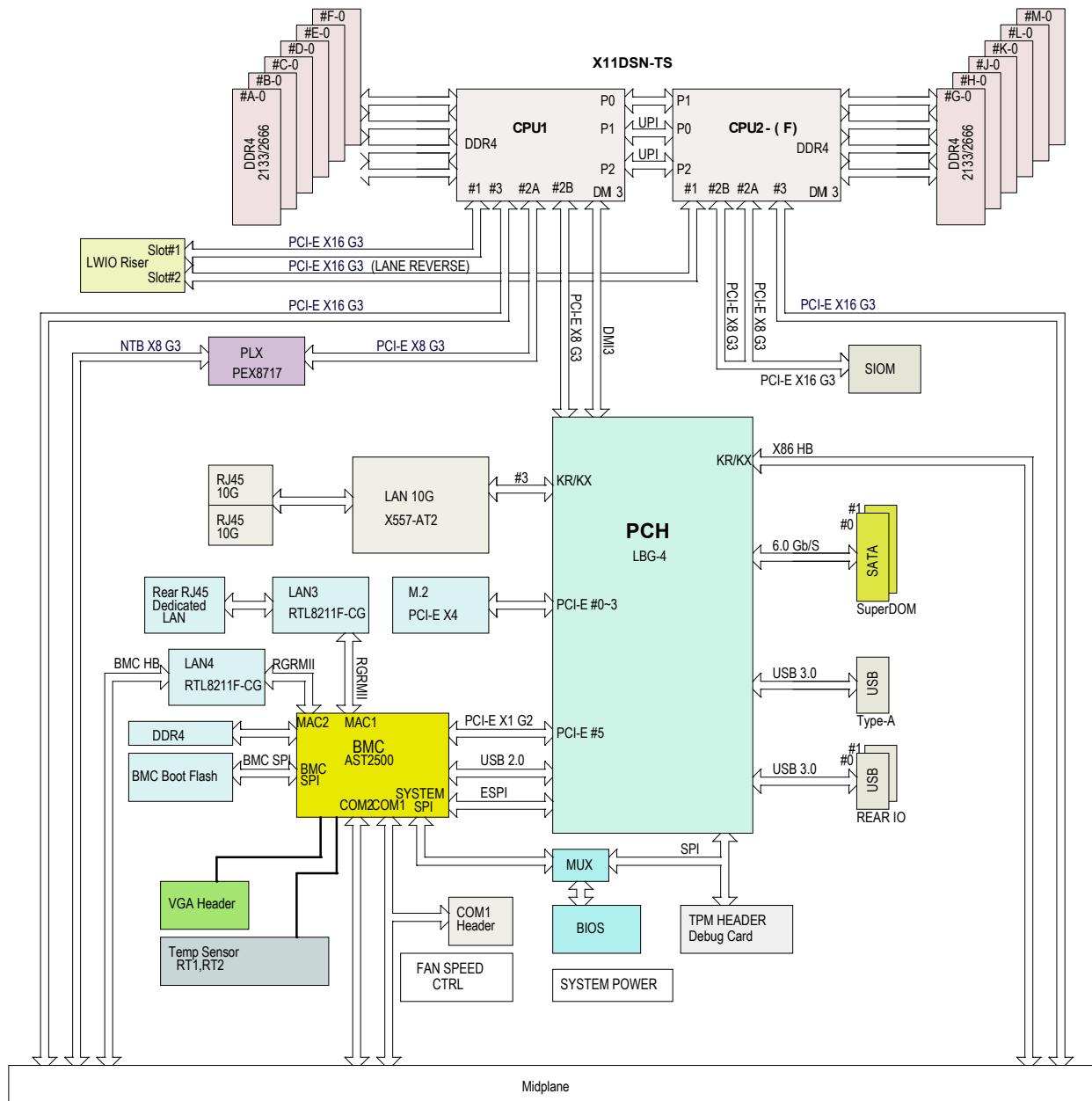
Figure 1-4. Motherboard Layout

### Notes:

- "■" indicates the location of Pin 1.
- Jumpers/components/LED indicators not indicated are used for internal testing only.
- Use only the correct type of onboard CMOS battery, as specified by the manufacturer. In order to avoid possible explosion, do not install the onboard battery upside down.

## Quick Reference Table

<b>Jumper</b>	<b>Description</b>	<b>Default Setting</b>
JBT1	CMOS Clear	Open (Normal)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPME2	Manufacturing Mode (ME) Select	Pins 1-2 (Normal)
JPX1	NTB (Non-Transparent Bridge) Enable	Pins 1-2 (Enabled)
JVRM1	VRM SMBus Clock	On (to BMC, Normal)
JVRM2	VRM SMBus Data	On (to BMC, Normal)
<b>Connector</b>	<b>Description</b>	
BT1	Onboard CMOS battery socket	
FAN1/FAN2	System cooling fan headers	
IPMI_LAN	Dedicated IPMI LAN port	
LAN1/LAN2	10GbE LAN ports 1/2 on the I/O back panel	
JCPLD1	Complex-Programmable Logical Device (CPLD) header	
JSD1/JSD2	Power connectors for SATA DOM (Disk-on-module) devices.	
JTPM1	Trusted Platform Module (TPM)/Port 80 connector	
M.2-P	PCI-E M.2 slot	
S-SATA0/S-SATA1	S-SATA 3.0 connection ports 0/1 supported by the Intel SCU. These S-SATA ports have power pins built-in and support Supermicro SuperDOM (Disk On Module) devices	
SIOM1	PCI-E 3.0 x8 (x16) slot supported by CPU2	
USB0/1	Back panel USB 3.0 ports	
USB2	Type A USB 3.0 header for front access	
VGA	VGA port	
<b>LED</b>	<b>Description</b>	<b>Status</b>
LEDM.2	Activity LED for M.2 slot	On: M.2 slot active
LEDH/LEDL	LEDH (the top LED): BMC Heartbeat	
	LED	LEDH (Blinking): BMC: normal
	LEDL (the bottom LED): System	LEDL (Blinking): system: normal
	Heatbeat LED	



**Figure 1-5. Intel C624 Chipset: System Block Diagram**

**Note:** This is a general block diagram and may not exactly represent the features on your motherboard. See the System Specifications appendix for the actual specifications of your motherboard.

# Chapter 2

## Server Installation

### 2.1 Overview

This chapter provides advice and instructions for mounting your system in a server rack. If your system is not already fully integrated with processors, system memory etc., refer to Chapter 4 for details on installing those specific components.

**Caution:** Electrostatic Discharge (ESD) can damage electronic components. To prevent such damage to PCBs (printed circuit boards), it is important to use a grounded wrist strap, handle all PCBs by their edges and keep them in anti-static bags when not in use.

### 2.2 Preparing for Setup

The box in which the system was shipped should include the rackmount hardware needed to install it into the rack. Please read this section in its entirety before you begin the installation.

#### Choosing a Setup Location

- The system should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated.
- Leave enough clearance in front of the rack so that you can open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow sufficient space for airflow and access when servicing.
- This product should be installed only in a Restricted Access Location (dedicated equipment rooms, service closets, etc.).

#### Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are extended to the floor so that the full weight of the rack rests on them.
- In single rack installations, 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 server or other component from the rack.

- You should extend only one server or 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 Appendix B.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components at the bottom of the rack first and then work your way up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges and voltage spikes and to keep your system operating in case of a power failure.
- Allow any drives and power supply modules to cool before touching them.
- When not servicing, always keep the front door of the rack and all covers/panels on the servers closed to maintain proper cooling.
- This product is not suitable for use with visual display workplace devices according to §2 of the German Ordinance for Work with Visual Display Units.

## **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 room's ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (TMRA).

### ***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.).



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.

## 2.3 Installing the Rails

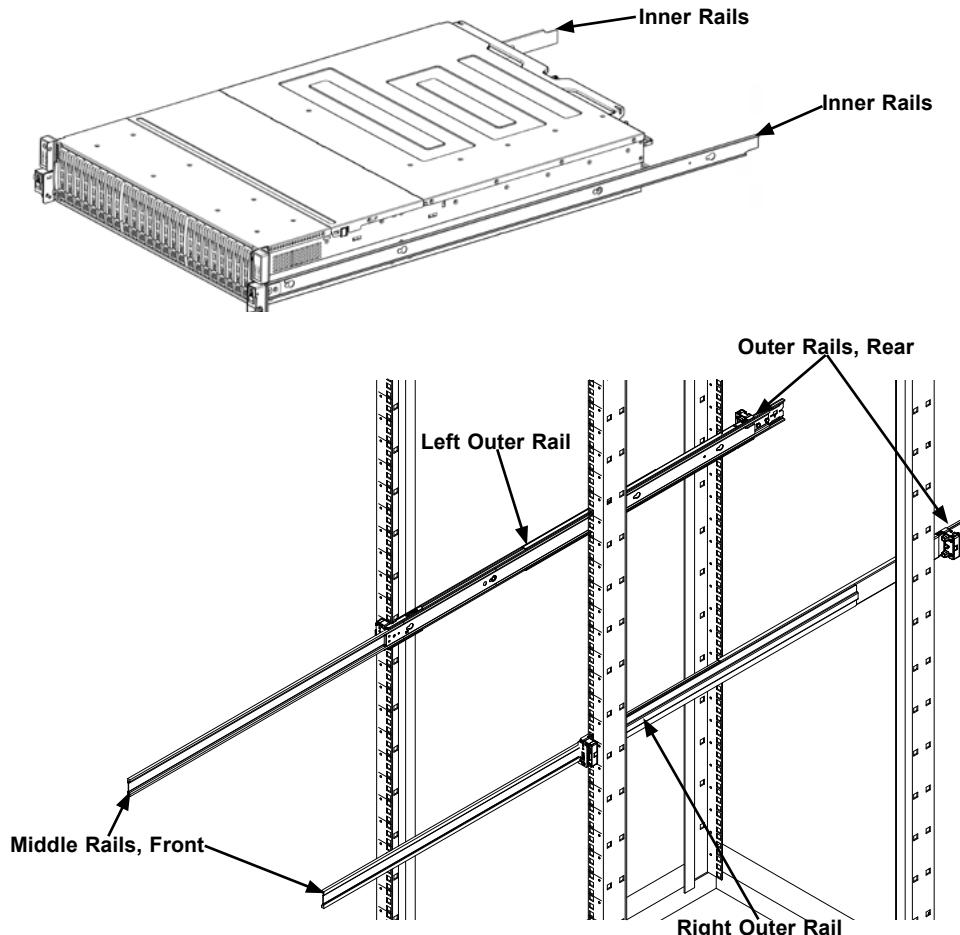
There are a variety of rack units on the market, which may require a slightly different assembly procedure.

The following is a basic guideline for installing the system into a rack with the rack mounting hardware provided. You should also refer to the installation instructions that came with the specific rack you are using.

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

### Identifying the Rails

The chassis package includes two rail assemblies. 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 which extends from 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**



Slide rail mounted equipment is not to be used as a shelf or a work space.



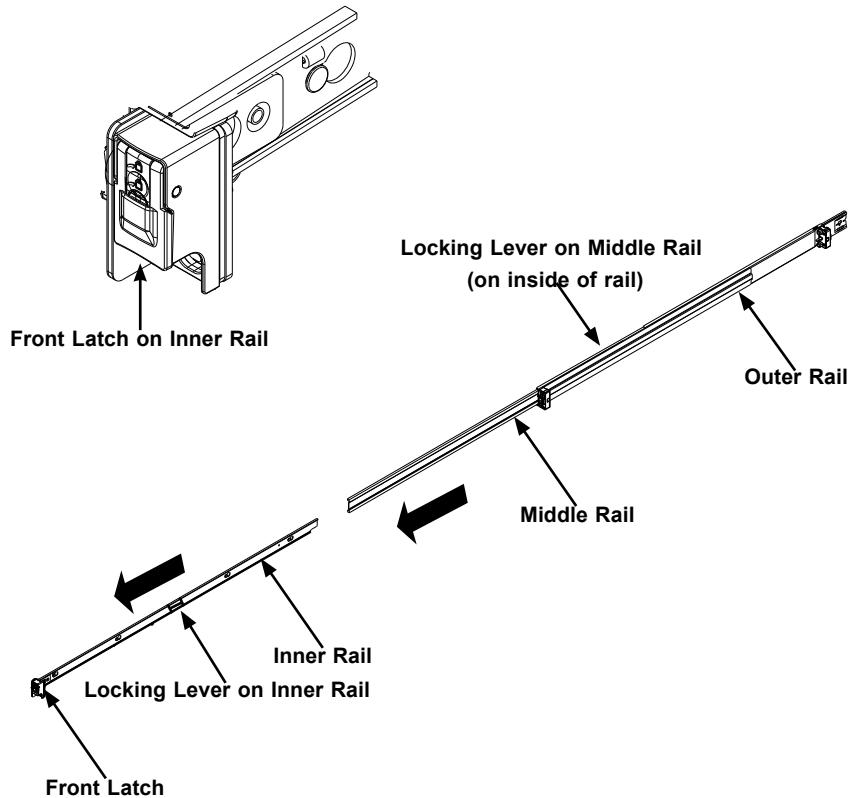
**Warning:** do not pick up the server with the front handles. They are designed to pull the system from a rack only.

## 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.

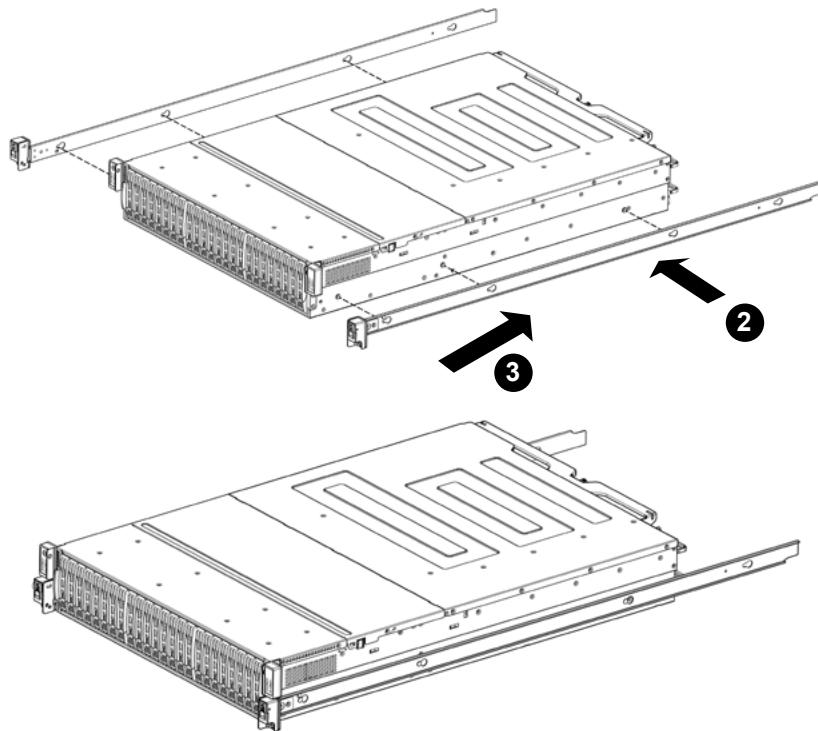


**Figure 2-2. Extending the Rails and Releasing the Inner Rail**

## Installing The Inner Rails on the Chassis

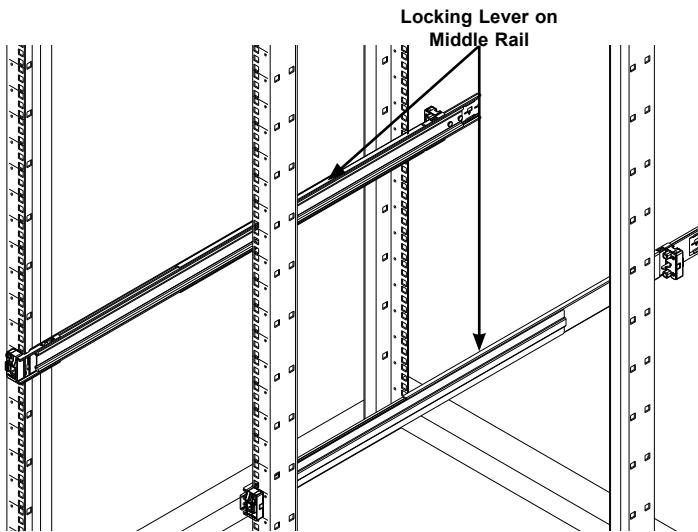
### *Installing the Inner Rails*

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**

1. Installing the outer rails on the rack
2. Installing the outer rails
3. Confirm that the left and right outer rails have been correctly identified.
4. Release the small locking lever on the inside of the middle rail and push the middle rail back into the outer rail.
5. 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.
6. 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.
7. 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.
8. Repeat for the other outer rail.



**Figure 2-4. Installing the Outer Rails**



**Warning:** 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.



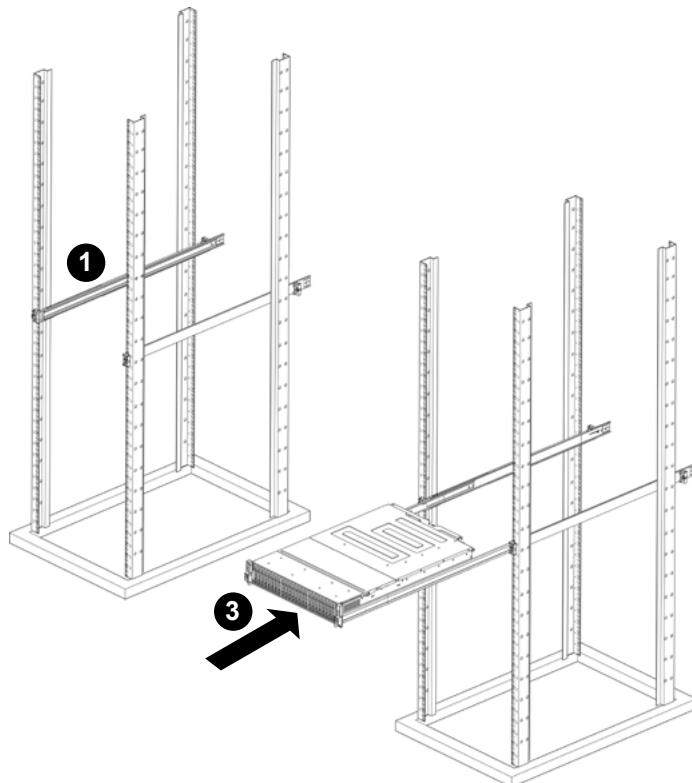
**Warning:** Mounting the system into the rack requires at least two people to support the chassis during installation. Please follow safety recommendations printed on the rails.

## 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.



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

## 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.

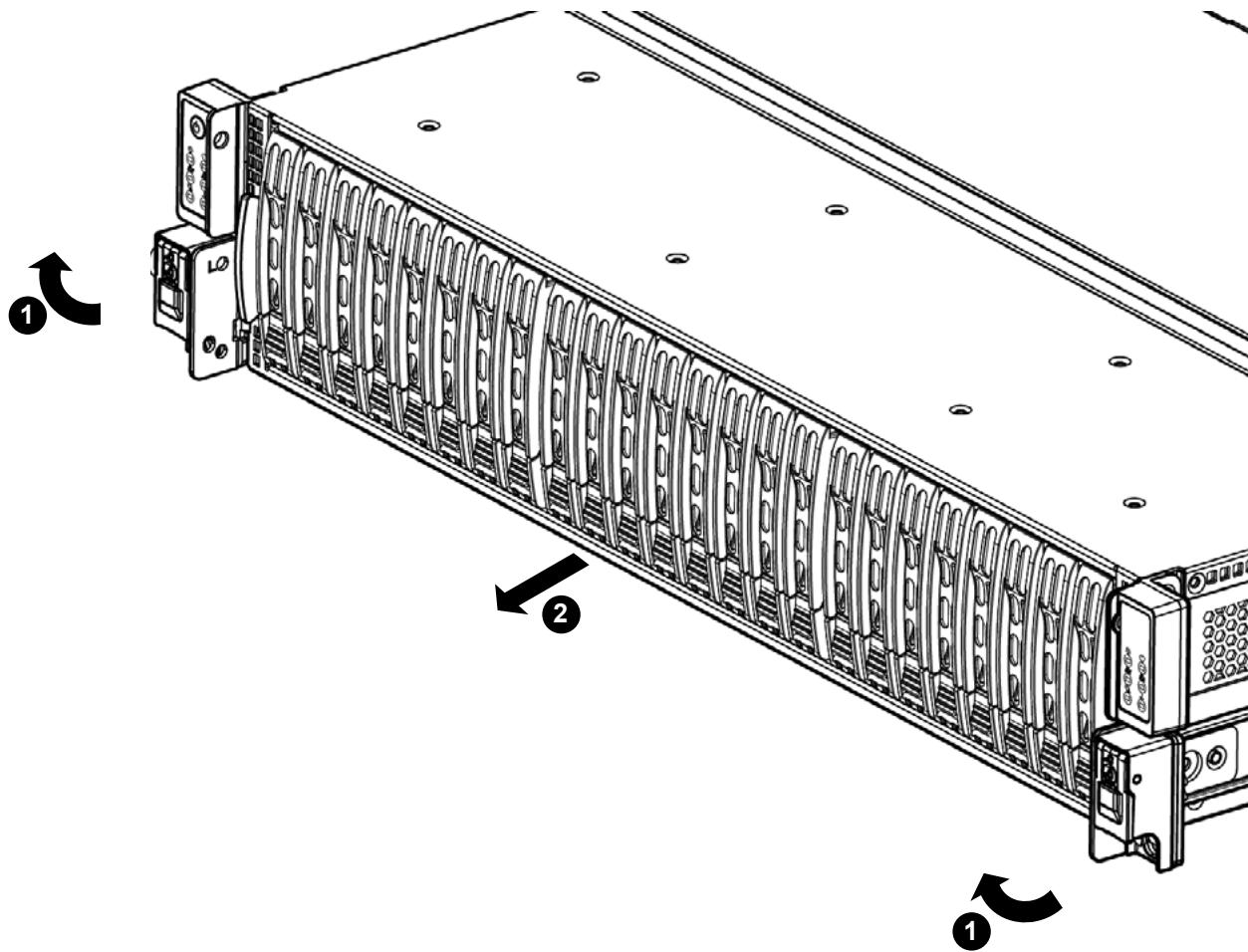


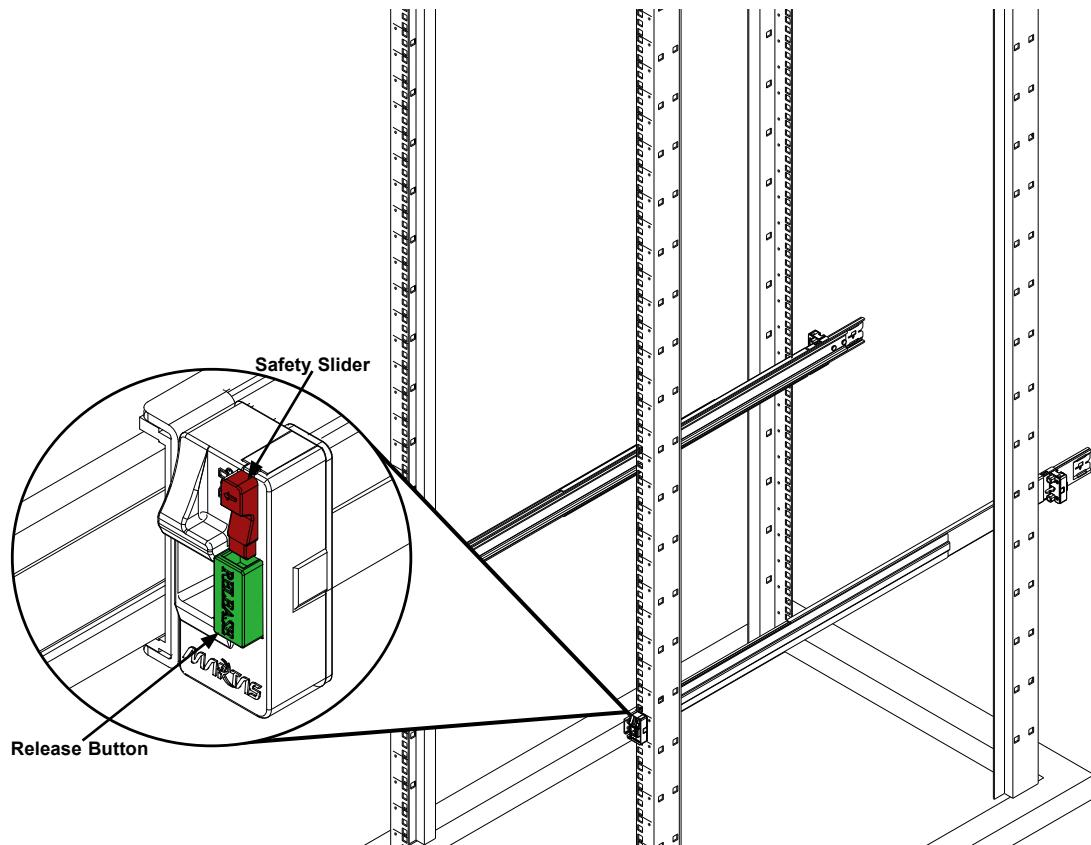
Figure 2-6. Removing the Chassis

## 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:** You have received a different outer rail than the one pictured. This rail features a 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

# Maintenance and Component Installation

This chapter provides instructions on installing and replacing main system components. To prevent compatibility issues, only use components that match the specifications and/or part numbers given.

Installation or replacement of most components require that power first be removed from the system. Please follow the procedures given in each section.

### 3.1 Removing Power

Use the following procedure to ensure that power has been removed from the system. This step is necessary when removing or installing non hot-swap components or when replacing a non-redundant power supply.

1. Use the operating system to power down the system.
2. After the system has completely shut-down, disconnect the AC power cord(s) from the power strip or outlet. (If your system has more than one power supply, remove the AC power cords from all power supply modules.)
3. Disconnect the power cord(s) from the power supply module(s).

### 3.2 Removing the Top Covers

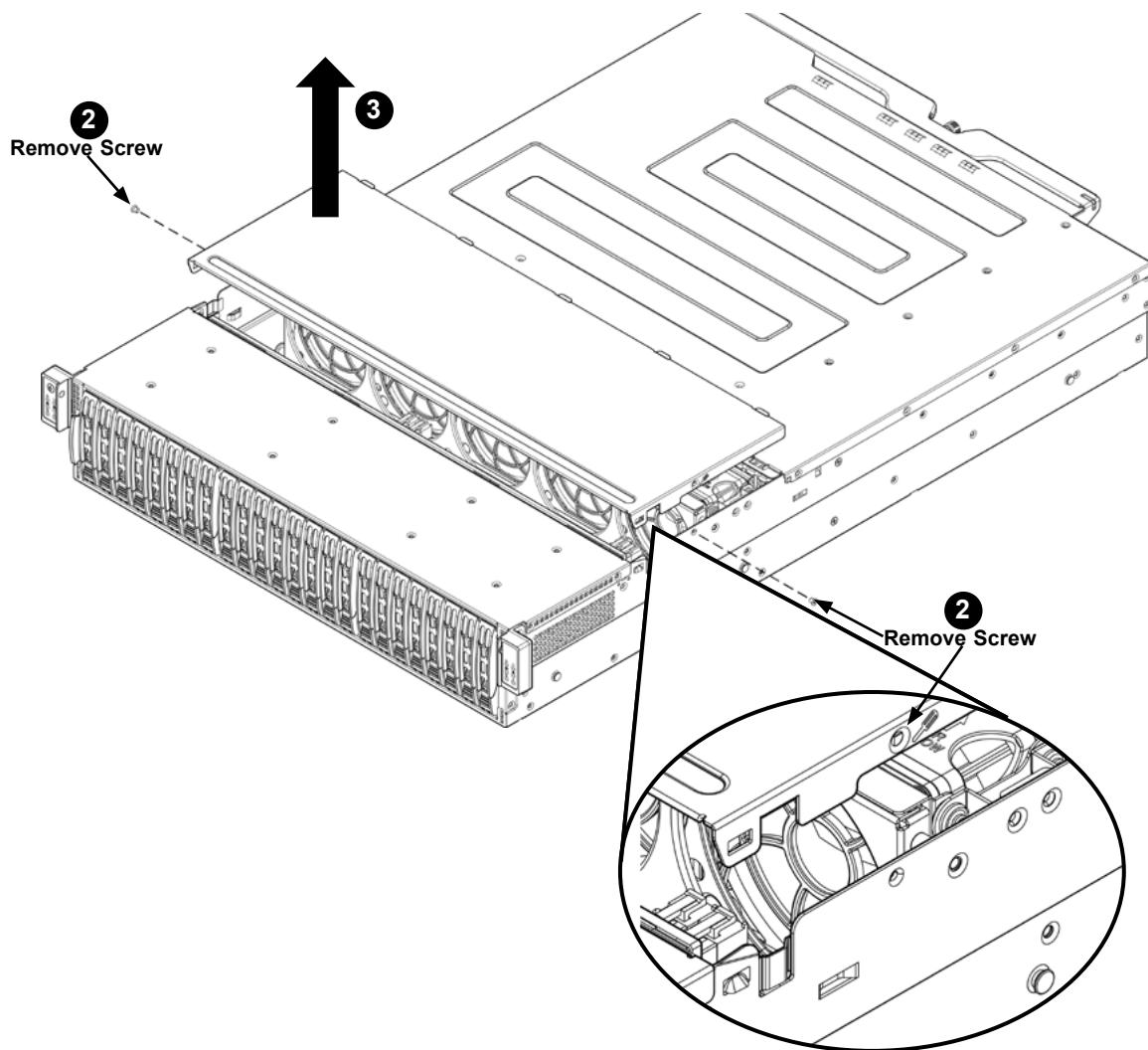
#### Mid-chassis Cover

The mid-chassis cover can be removed to access the fans while the server continues to operate.

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

#### *Removing the Mid-chassis Cover*

1. Power down the system and remove the power cords from the rear of the power supplies as described in Section 3-1.
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.

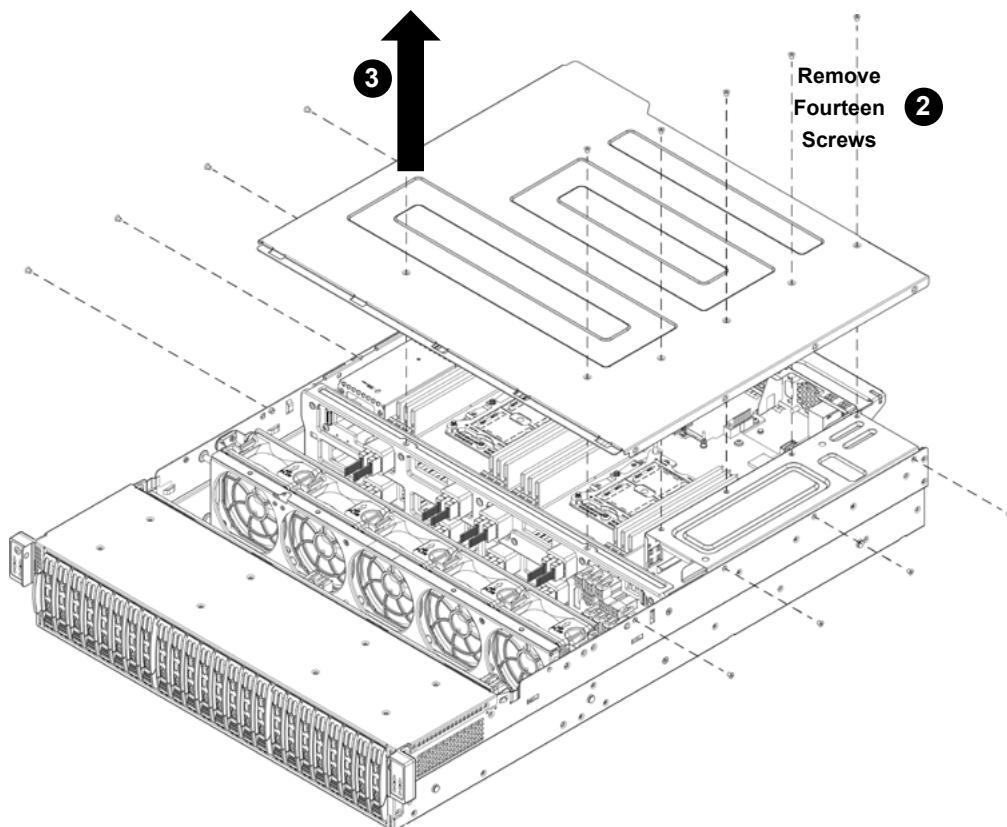


**Figure 3-1. Removing the Mid-chassis Cover**

## 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 3-1.
2. Remove the front cover as described in Section 3-2.
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.



**Figure 3-2. Removing the Rear Cover**

## 3.3 Motherboard Components

### Processor and Heatsink Installation

The Intel Xeon 81xx/61xx/51xx/41xx/31xx and 82xx/62xx/52xx/42xx/32xx series processor series comes in two models: Fabric (F model) and Non-Fabric (Non-F model). Only the Non-Fabric model is supported for this system.

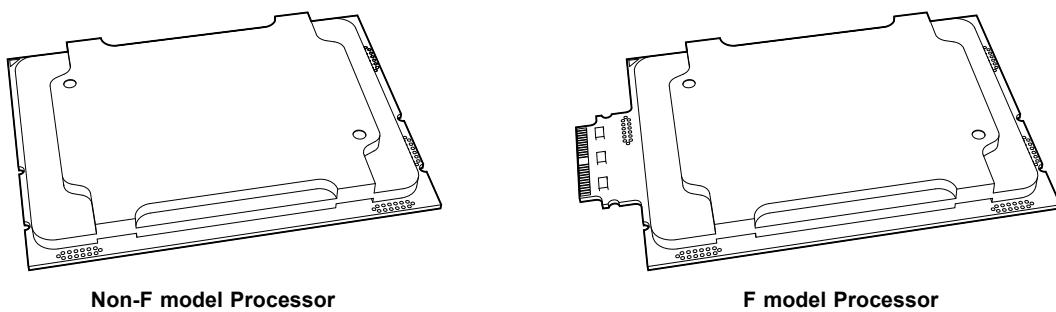
The processor (CPU) and heatsink should be assembled together first to form the processor heatsink module (PHM), and then install the PHM into the CPU socket.

**Caution:** Use ESD protection. Do not touch the underside of the CPU. Improper installation or socket misalignment can cause serious damage to the CPU or socket which may require manufacturer repairs.

#### Notes:

- All power should be off, as described in Section 3.1, before installing the processors.
- When handling the processor package, avoid placing direct pressure on the label area of the CPU or socket.
- Check that the plastic socket dust cover is in place and none of the socket pins are bent—otherwise, contact your retailer.
- Refer to the Supermicro website for updates on CPU support.
- Graphics in this manual are for illustration. Your components may look slightly different.

#### *The Xeon Scalable Processor*



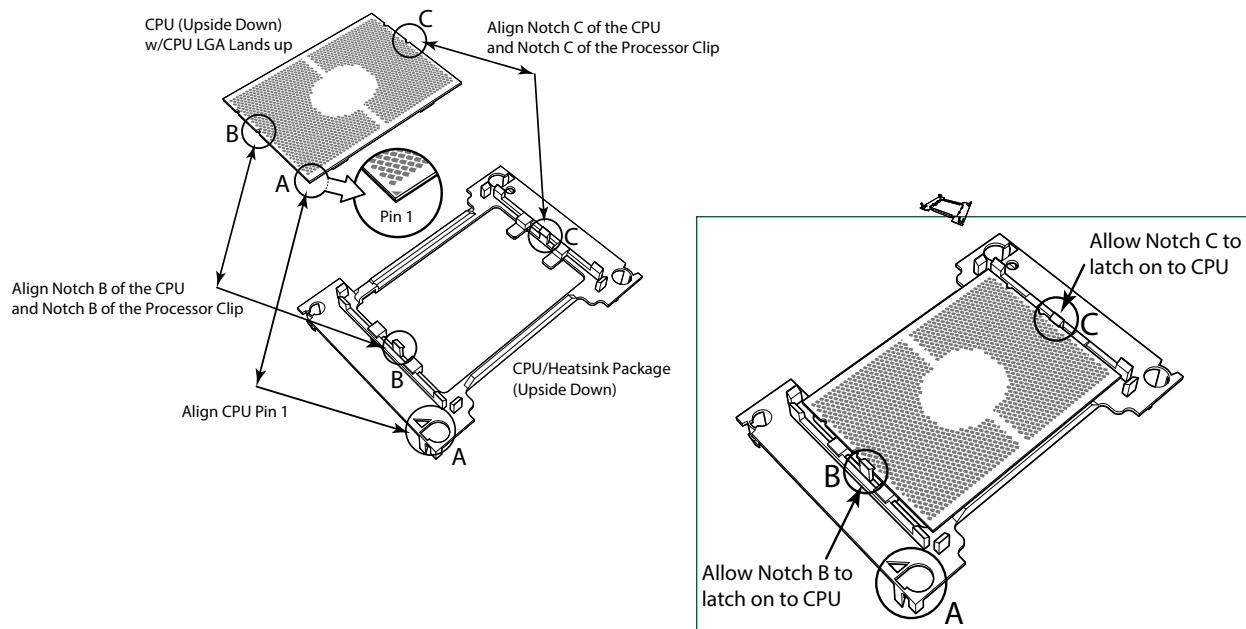
**Figure 3-3. Xeon Scalable Processors**

## Assembling the Processor Package

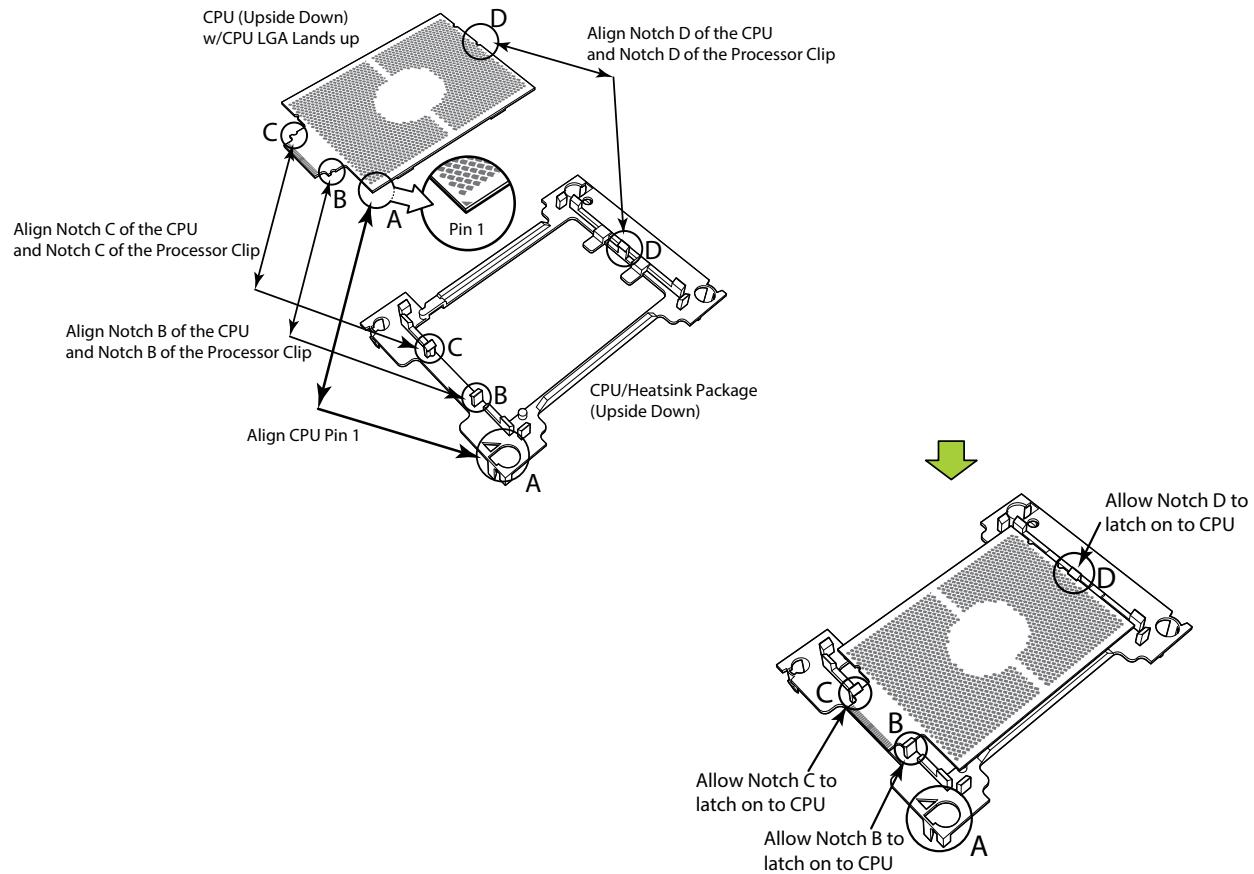
Attach the processor to the thin processor clip to create the processor package.

1. On the top corner of the CPU, locate pin 1 (A), marked by a triangle. Also, locate notch B and notch C (and notch D for F models) on the CPU as shown below.
2. On the top of the processor clip, locate the corner marked by a hollow triangle as the position for pin 1. Also locate notch B and notch C (and D for F models) on the processor clip.
3. Align pin 1 of the CPU with its proper position on the processor clip and carefully insert the CPU into the processor clip. Slide notch B of the CPU into tab B of the processor clip, and slide notch C of the CPU into tab C of the processor clip (and D for F models) until the processor clip tabs snap onto the CPU.
4. Examine all corners to ensure that the CPU is properly seated and secure on the processor clip.

The processor package assembly is created.



**Processor Package Assembly for the non-F Model Processors**

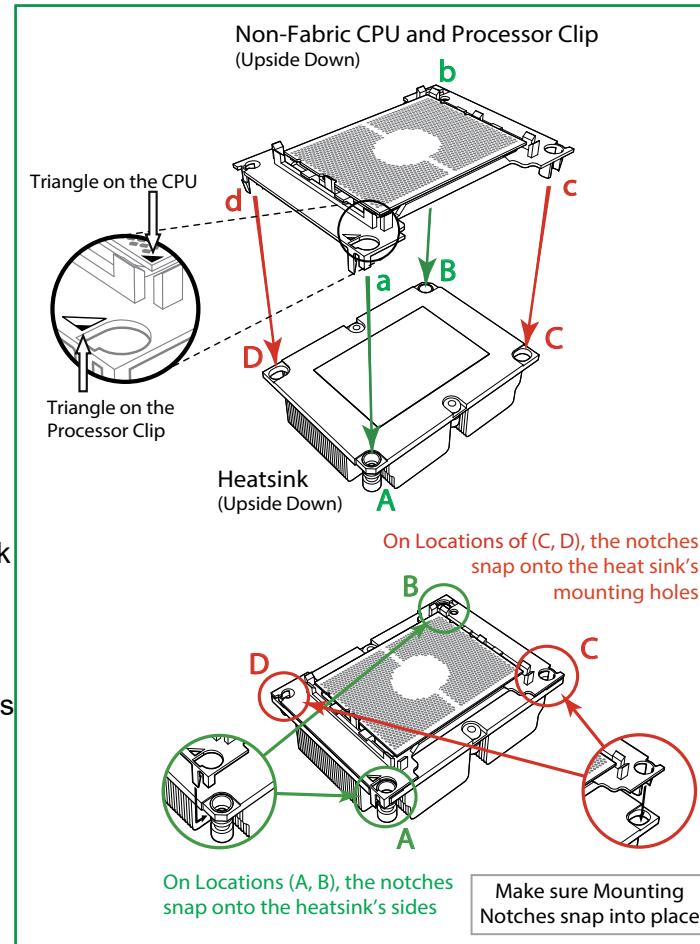


**Processor Package Assembly for the F Model Processors**

After creating the processor package assembly, mount it onto the heatsink to create the processor heatsink module (PHM).

1. On the heatsink label, locate "1" and the corner next to it. Turn the heatsink upside down with the thermal grease side facing up, keeping track of the "1" corner.
2. Remove the protective thermal film if present. If this is a new heatsink, the necessary thermal grease has been pre-applied in the factory. If the heatsink is not new, apply the proper amount of the thermal grease.
3. In the plastic processor clip, locate the hollow triangle at the corner ("a" in the drawing below) next to a hole and plastic mounting clips. There is a similar hole and mounting clips at the diagonal corner of the of the processor clip ("b" in the drawing).
4. With the underside of heatsink and the underside of the processor package facing up, align the "1" corner on the heatsink ("A" in the drawing) against the mounting clips next to the hollow triangle ("a") on the processor package.
5. Also align the corner ("B") at the diagonal side of the heatsink with the corresponding clips on the processor package ("b").
6. Once aligned, press the processor package assembly onto the heatsink until the mounting clips (at a, b, c, and d) snap into place.

The processor heatsink module is assembled.

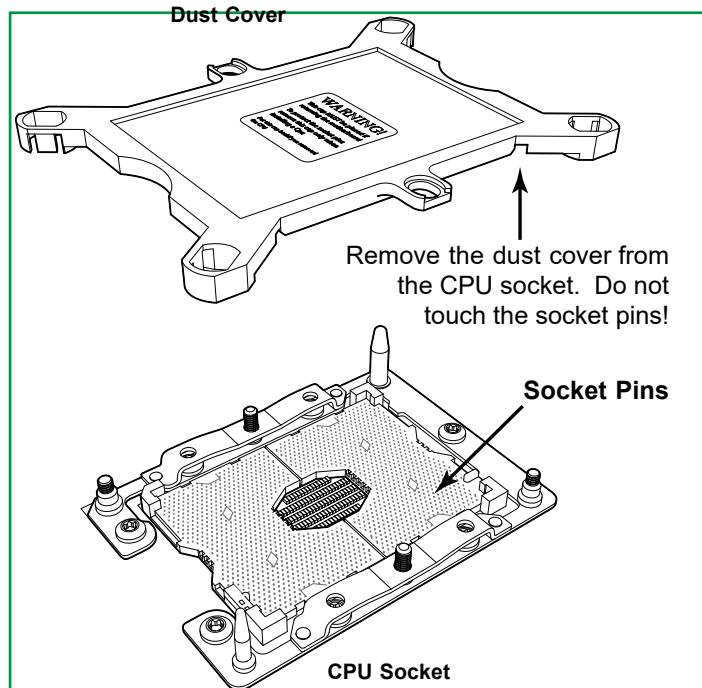


### Assembling the Processor Heatsink Module

### **Removing the Dust Cover from the CPU Socket**

Remove the dust cover from the CPU socket, exposing the socket pins as shown below.

**Caution:** Do not touch the socket pins.

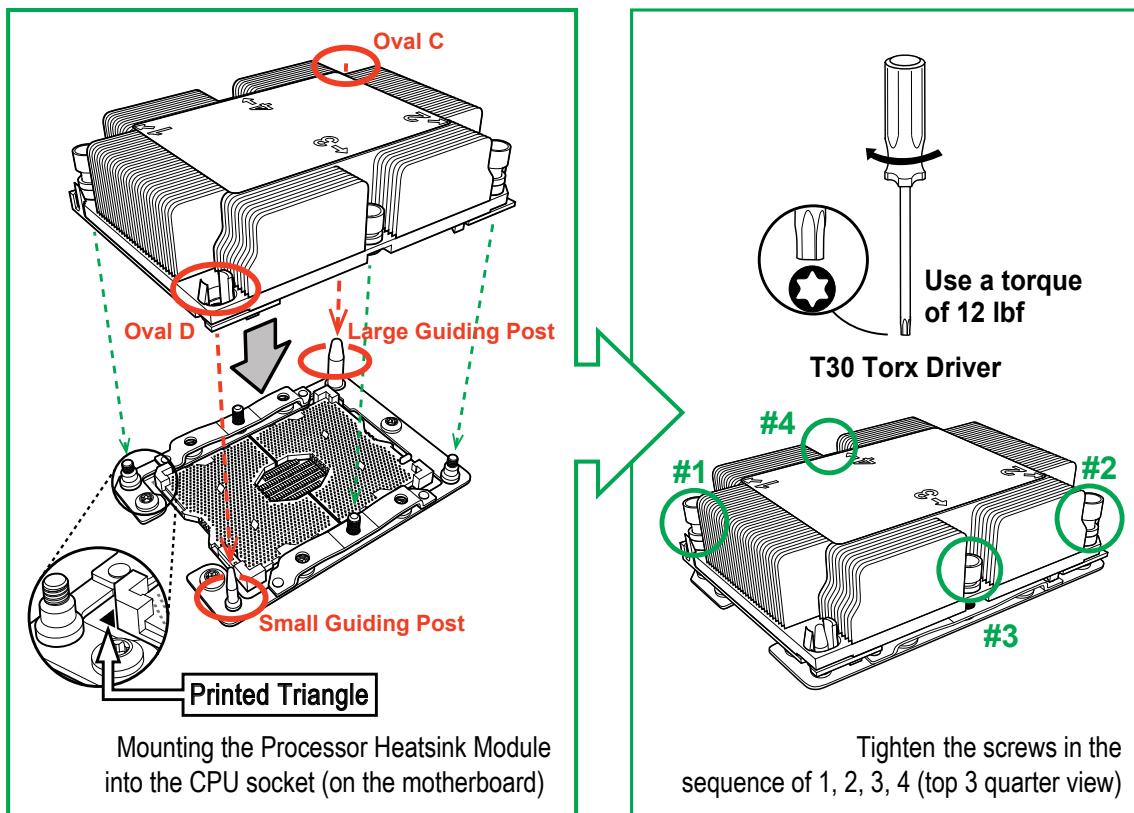


**Removing the Socket Dust Cover**

### Installing the Processor Heatsink Module (PHM)

1. Locate the triangle (pin 1) on the CPU socket. Also locate the pin 1 corner of the PHM that is closest to "1" on the heatsink label. To confirm, look at the underside of the PHM and note the hollow triangle in the processor clip and printed triangle on the CPU located next to a screw at the corner.
2. Align the pin 1 corner of the PHM over the pin 1 corner on the CPU socket.
3. Align the two holes at diagonal corners of the PHM onto the two guide posts on the socket bracket and carefully lower the PHM onto the socket.
4. Use a T30 Torx-bit screwdriver to install four screws into the mounting holes on the socket to securely attach the PHM onto the motherboard in the sequence of 1, 2, 3, and 4, as marked on the heatsink label. Gradually tighten each to assure even pressure.

**Note:** Use only 12 foot-pounds of torque when tightening the screws to avoid damaging the processor or the socket.

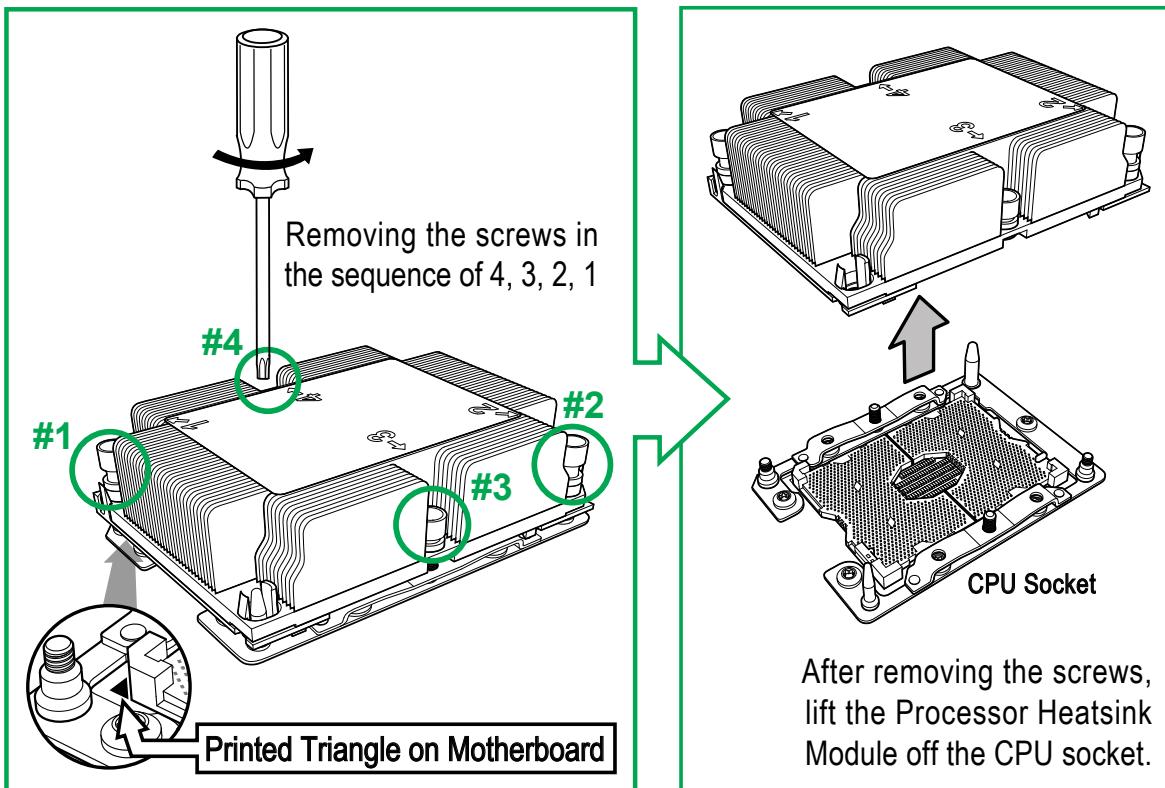


### Installing the Processor Heatsink Module

### Removing the Processor Heatsink Module from the Motherboard

Before removing the processor heatsink module (PHM), power down as described in Section 3.1.

1. Using a T30 Torx-bit screwdriver, loosen and remove the screws on the PHM from the socket, starting with the screw marked #4, in the sequence of 4, 3, 2, 1.
2. Pull up the PHM while releasing the small snap tabs on two corners of the socket.



### Removing the Processor Heatsink Module

## 3.4 Memory Support and Installation

**Note:** Check the Supermicro website for recommended memory modules.

**Important:** Exercise extreme care when installing or removing DIMM modules to prevent any damage.

This document provides the user with an easy-to-use guide for proper memory configuration and installation for the X11 UP/DP/MP (Socket P/Socket P0) motherboards utilizing 3DS LRDIMM/LRDIMM/3DS RDIMM/RDIMM/NV-DIMM DDR4 (288-pin) ECC memory with speeds of 2933\*/2666/2400/2133 memory modules (**\*Note below**).

To ensure proper memory installation, please carefully follow the information and instructions provided in this user's guide.

**Note:** 2933 MHz memory is supported by the 82xx/62xx series processors only.

### ESD Precautions

Electrostatic Discharge (ESD) can damage electronic components including memory modules. To avoid damaging your DIMM modules, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

#### ***Precautions***

- Use a grounded wrist strap designed to prevent static discharge.
- Handle the memory module by its edges only.
- Put the memory modules into the antistatic bags when not in use.
- Check the Supermicro website for recommended memory modules

### Introduction to Intel® Optane DC Persistent Memory

Intel® 82xx/62xx/52xx/4215 supports new DCPMM (Optane™ DC Persistent Memory Modules) technology. DCPMM offers data persistence with higher capacity at lower latencies than the existing memory modules and provides hyper-speed storage capability for high performance computing platforms with flexible configuration options.

### Memory Support

The motherboard features 12 slots that can support up to 3 TB of 3DS Load Reduced DIMM (3DS LRDIMM), 3DS Registered DIMM (3DS RDIMM) and NV-DIMM DDR4 (288-pin) ECC memory 2933/2666/2400/2133 Mhz speed modules in up to 12 slots per node. Refer to the following tables for detailed information on memory support for the X11 UP/DP/MP motherboards.

**Note:** 2933 MHz memory is supported by the 82xx/62xx series processors only.

DDR4 Memory Support for 81xx/61xx/51xx/41xx/31xx Processors						
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s)		
		DRAM Density		One DIMM per Channel	One DIMM per Channel	Two DIMMs per Channel
		4 Gb	8 Gb	1.2 Volts	1.2 Volts	1.2 Volts
RDIMM	SRx4	4 GB	8 GB	2666	2666	2666
	SRx8	8 GB	16 GB			
	DRx8	8 GB	16 GB			
	DRx4	16 GB	32 GB			
RDIMM 3Ds	QRx4	N/A	2H-64GB	2666	2666	2666
	8RX4	N/A	4H-128GB			
LRDIMM	QRx4	32 GB	64 GB			
LRDIMM 3Ds	QRx4	N/A	2H-64GB			
	8Rx4	N/A	4H-128 GB			

DDR4 Memory Support for 82xx/62xx/52xx/42xx/32xx Processors							
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)			Speed (MT/s)		
		DRAM Density			One Slot per Channel	Two Slots per Channel	
		4 Gb	8 Gb	16 Gb	1.2 Volts	1.2 Volts	1.2 Volts
RDIMM	SRx4	4 GB	8 GB	16 GB	2933	2933	2933
	SRx8	8 GB	16 GB	32 GB			
	DRx8	8 GB	16 GB	32 GB			
	DRx4	16 GB	32 GB	64 GB			
RDIMM 3Ds	QRx4	N/A	2H-64GB	2H-128GB	2933	2933	2933
	8RX4	N/A	4H-128GB	4H-256GB			
LRDIMM	QRx4	32 GB	64 GB	128 GB			
LRDIMM 3Ds	QRx4	N/A	2H-64GB	2H-64GB			
	8Rx4	N/A	4H-128 GB	4H-256 GB			

### Memory Installation Sequence

Memory modules for the X11 UP/DP/MP motherboards are populated using the "Fill First" method. The blue memory slot of each channel is considered the "first DIMM module" of the channel, and the black slot, the second module of the channel. When installing memory modules, be sure to populate the blue memory slots first and then populate the black slots. To maximize memory capacity and performance, please populate all DIMM slots on the motherboard, including all blue slots and black slots.

### **General Memory Population Requirements**

1. Be sure to use the memory modules of the same type and speed on the motherboard. Mixing of memory modules of different types and speeds is not allowed.
2. Using unbalanced memory topology such as populating two DIMMs in one channel while populating one DIMM in another channel on the same motherboard will result in reduced memory performance.
3. Populating memory slots with a pair of DIMM modules of the same type and size will result in interleaved memory, which will improve memory performance.

### **DIMM Population Guidelines for Optimal Performance**

For optimal memory performance, follow the instructions listed in the tables below when populating memory modules.

#### *Key Parameters for DIMM Configuration*

Key Parameters for DIMM Configurations	
Parameters	Possible Values
<b>Number of Channels</b>	1, 2, 3, 4, 5, or 6
<b>Number of DIMMs per Channel</b>	1DPC (1 DIMM Per Channel) or 2DPC (2 DIMMs Per Channel)
<b>DIMM Type</b>	RDIMM (w/ECC), 3DS RDIMM, LRDIMM, 3DS LRDIMM
<b>DIMM Construction</b>	non-3DS RDIMM Raw Cards: A/B (2Rx4), C (1Rx4), D (1Rx8), E (2Rx8) 3DS RDIMM Raw Cards: A/B (4Rx4) non-3DS LRDIMM Raw Cards: D/E (4Rx4) 3DS LRDIMM Raw Cards: A/B (8Rx4)

#### *DIMM Mixing Guidelines*

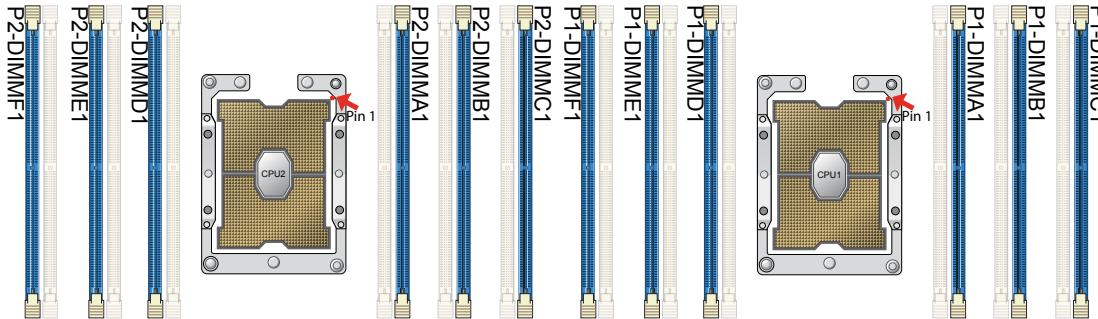
General DIMM Mixing Guidelines
<ul style="list-style-type: none"> <li>• All DIMMs must be all DDR4 DIMMs.</li> <li>• x4 and x8 DIMMs can be mixed in the same channel.</li> <li>• Mixing of LRDIMMs and RDIMMs is not allowed in the same channel, across different channels, and across different sockets.</li> <li>• Mixing of non-3DS and 3DS LRDIMM is not allowed in the same channel, across different channels, and across different sockets.</li> </ul>

Mixing of DIMM Types within a Channel			
DIMM Types	RDIMM	LRDIMM	3DS LRDIMM
<b>RDIMM</b>	Allowed	Not Allowed	Not Allowed
<b>LRDIMM</b>	Not Allowed	Allowed	Not Allowed
<b>3DS LRDIMM</b>	Not Allowed	Not Allowed	Allowed

**Note:** Unbalanced memory configuration decreases memory performance and is not recommended for Supermicro motherboards.

Memory Population Tables for X11DP Motherboards w/12 DIMM Slots	
CPUs/DIMMs	Memory Population Sequence
<b>1 CPU &amp; 1 DIMM</b>	CPU1: P1-DIMMA1
<b>1 CPU &amp; 2 DIMMs</b>	CPU1: P1-DIMMA1/P1-DIMMD1
<b>1 CPU &amp; 3 DIMMs</b>	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1
<b>1 CPU &amp; 4 DIMMs</b>	CPU1: P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1
<b>1 CPU &amp; 5 DIMMs*</b>	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1
<b>1 CPU &amp; 6 DIMM</b>	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1
<b>2 CPUs &amp; 2 DIMMs</b>	CPU1: P1-DIMMA1 CPU2: P2-DIMMA1
<b>2 CPUs &amp; 4 DIMMs</b>	CPU1: P1-DIMMA1/P1-DIMMD1 CPU2: P2-DIMMA1/P2-DIMMD1
<b>2 CPUs &amp; 6 DIMMs</b>	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1 CPU2: P2-DIMMC1/P2-DIMMB1/P2-DIMMA1
<b>2 CPUs &amp; 8 DIMMs</b>	CPU1: P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1 CPU2: P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1
<b>2 CPUs &amp; 10 DIMMs</b>	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1 CPU2: P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1
<b>2 CPUs &amp; 12 DIMMs</b>	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1 CPU2: P2-DIMMC1/P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1

\*Unbalanced, not recommended.



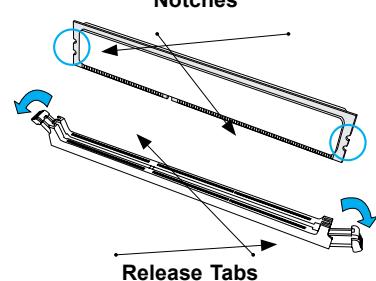
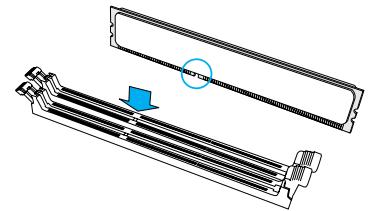
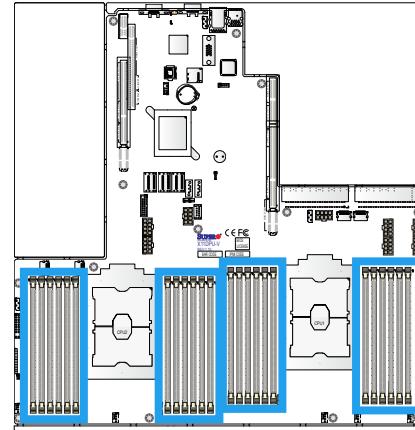
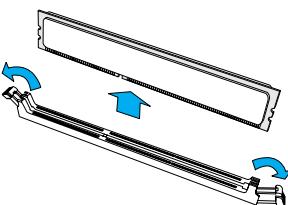
**Note:** The drawing above shows DIMM module population for each CPU installed on the motherboard. Please install your processors starting with CPU Socket 1.

### DIMM Installation

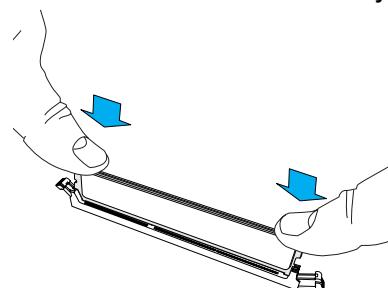
1. Insert the desired number of DIMMs into the memory slots, starting with P1-DIMM A1. For the system to work properly, please use memory modules of the same type and speed on the motherboard.
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.
3. Align the key of the DIMM module with the receptive point on the memory slot.
4. Align the notches on both ends of the module against the receptive points on the ends of the slot.
5. Use two thumbs together to press both ends of the module straight down into the slot until the module snaps into place.
6. Press the release tabs to the lock positions to secure the DIMM module into the slot.

### DIMM Module Removal

Press the release tabs on both ends of the DIMM socket to release the DIMM module from the socket as shown in the drawing below.



Insert the DIMM module into the memory slot.



**Warnings:** 1. Please do not use excessive force when pressing the release tabs on the ends of the DIMM socket to avoid causing any damage to the DIMM module or the DIMM socket. 2. Please handle DIMM modules with care. Carefully follow all the instructions given on Page 1 of this chapter to prevent ESD-related damages to your memory modules or components.

## Motherboard Battery

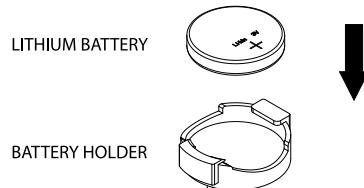
The motherboard uses non-volatile memory to retain system information when system power is removed. This memory is powered by a lithium battery residing on the motherboard.

### **Replacing the Battery**

Begin by removing power from the system as described in section 3.1.

1. Push aside the small clamp that covers the edge of the battery. When the battery is released, lift it out of the holder.
2. To insert a new battery, slide one edge under the lip of the holder with the positive (+) side facing up. Then push the other side down until the clamp snaps over it.

**Note:** 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.



**Figure 3-4. Installing the Onboard Battery**

**Warning:** There is a danger of explosion if the onboard battery is installed upside down (which reverses its polarities). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032).

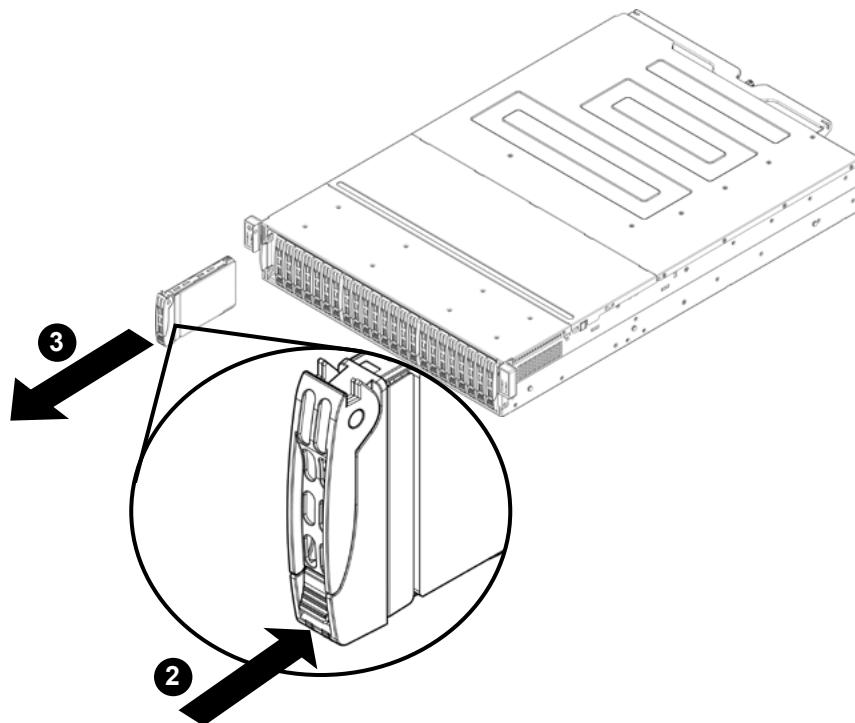
## 3.5 Chassis Components

### Installing Hard Drives

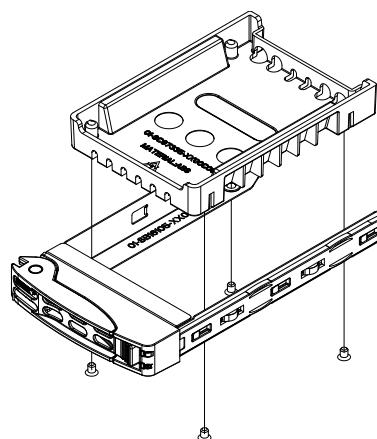
The SC227TS comes equipped with 24 2.5" hot-swappable hard drives. These drives can be removed without powering down the system. Only enterprise level NVMe drives are supported.

#### ***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 3-5. Removing Hard Drive**

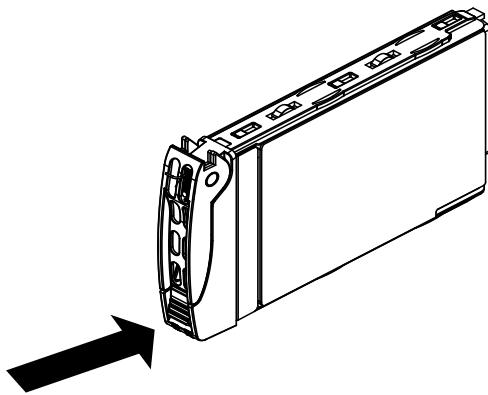


**Figure 3-6. Removing the Dummy Drive from the Hard Drive Carrier**

***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.

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



**Figure 3-7. Proper Installation of the Hard Drive into the Hard Drive Bay**

### **Drive Carrier LEDs**

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

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

## Removing the Motherboard Modules

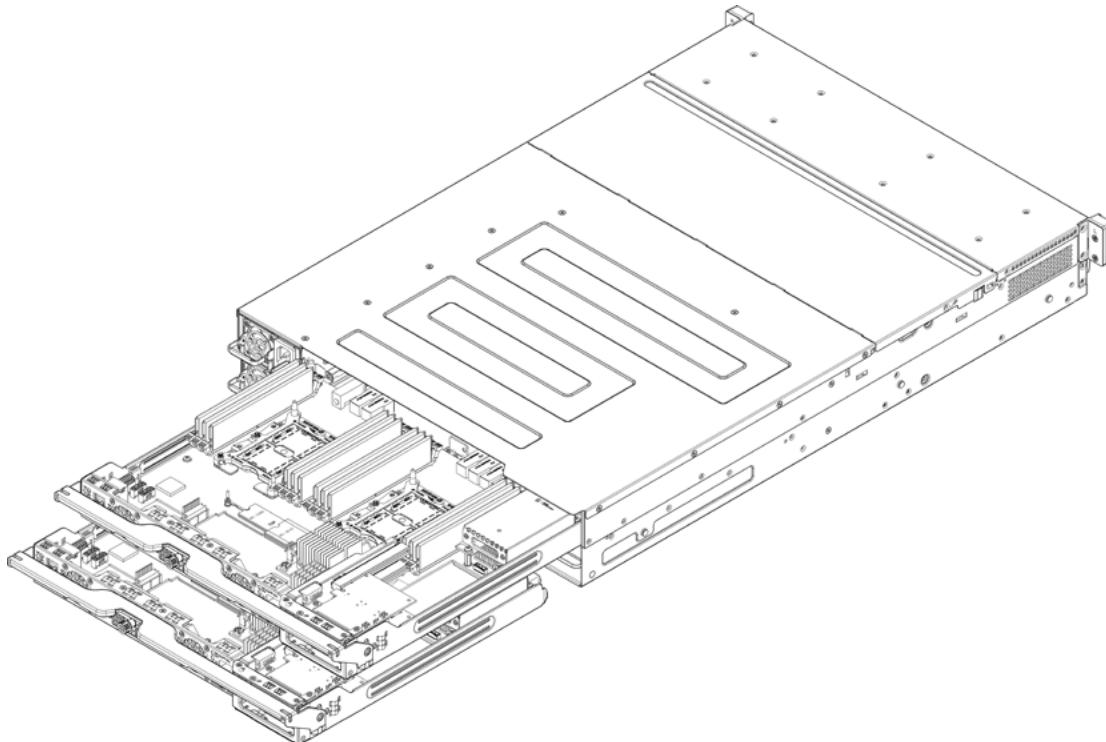
The SC227TS features a removable motherboard module that allows easy access to the motherboard.

### ***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 3-1. Remove the mid-chassis and rear covers as described in Section 3-2.
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 3-8. Removing the Motherboard Modules**

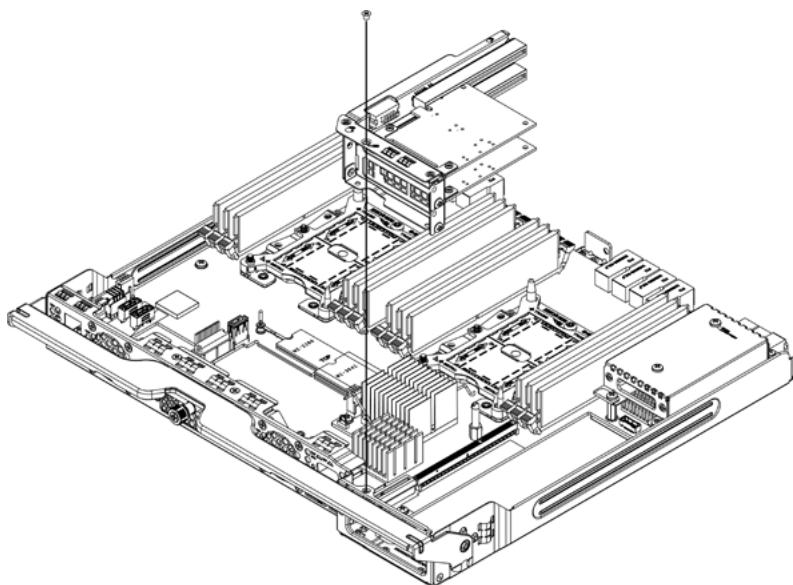
## Installing the Expansion Cards

The SC227TS 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, as described in Section 3-1, and remove the power cords from the rear of the power supplies.
2. Remove the motherboard modules as described previously in this section.
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.



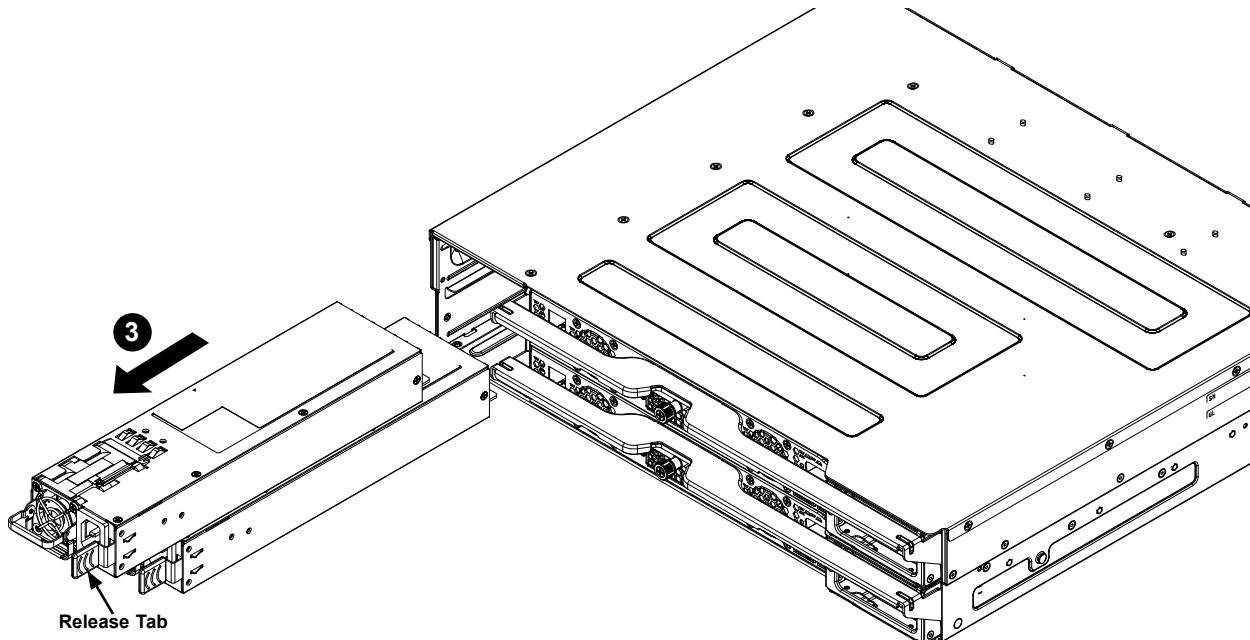
**Figure 3-9. Removing the Expansion Cards**

## Changing the Power Supplies

The SC227TS 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.

### ***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.



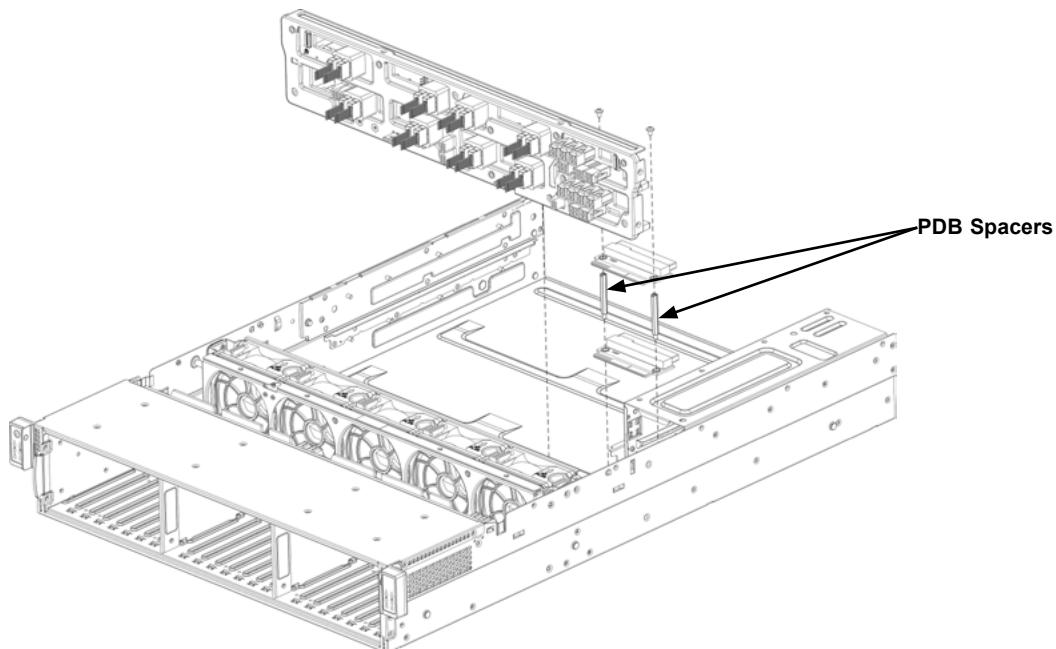
**Figure 3-10. Removing the Power Supply**

## Power Distributor Board

The SC227TS 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.

### ***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 3-1. Remove the covers as described in Section 3-2. Remove the motherboard modules as described in earlier in this section.
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 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.



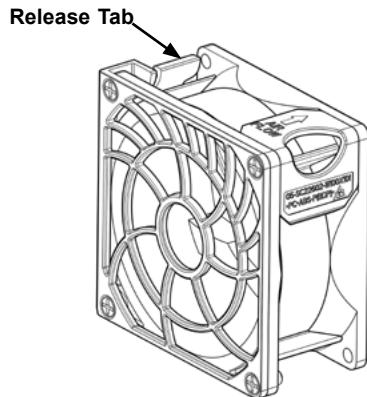
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**Figure 3-11. Installing the Power Distributor Board and Spacers**

## 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 SC227TS fans are hot-swappable, enabling the fans to be replaced without powering down the system.

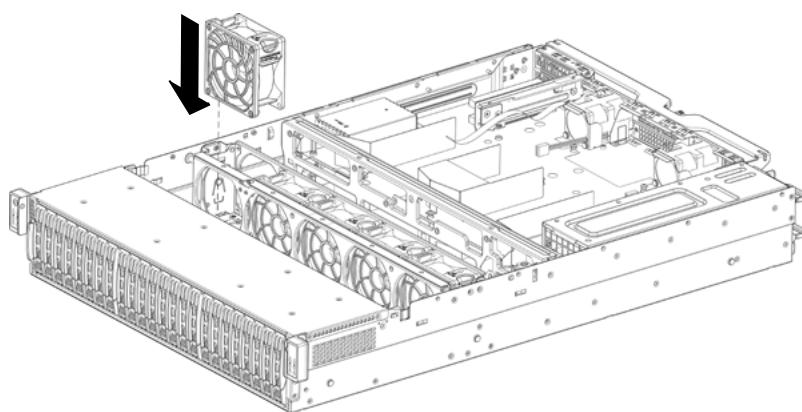
Fan speed is controlled by system temperature via BMC. If a fan fails, the remaining fans will ramp up to full speed. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).



**Figure 3-12. 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. Open the chassis covers as described in Section 3-2.
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 3-13. Placing the System Fan**

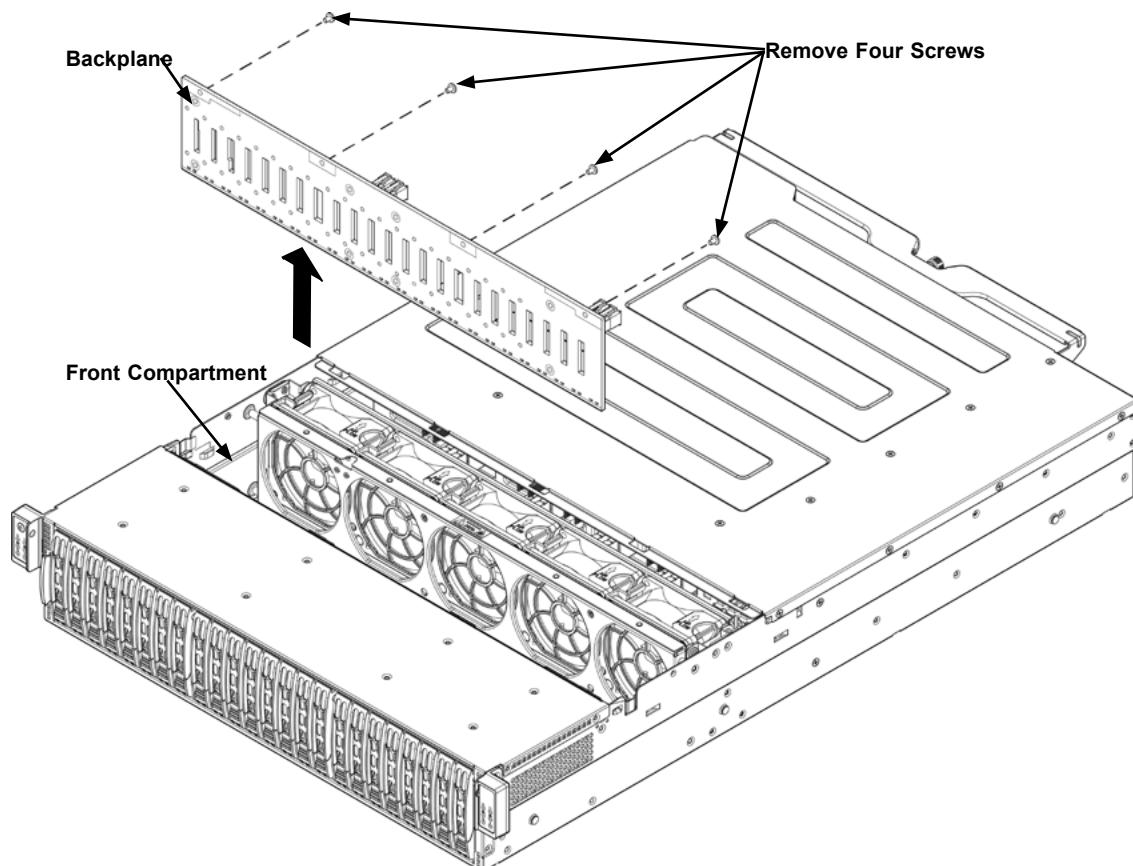
## Removing and Installing the Backplanes

The SC227TS 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 3-1 and open the chassis covers as described in Section 3-2.
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.

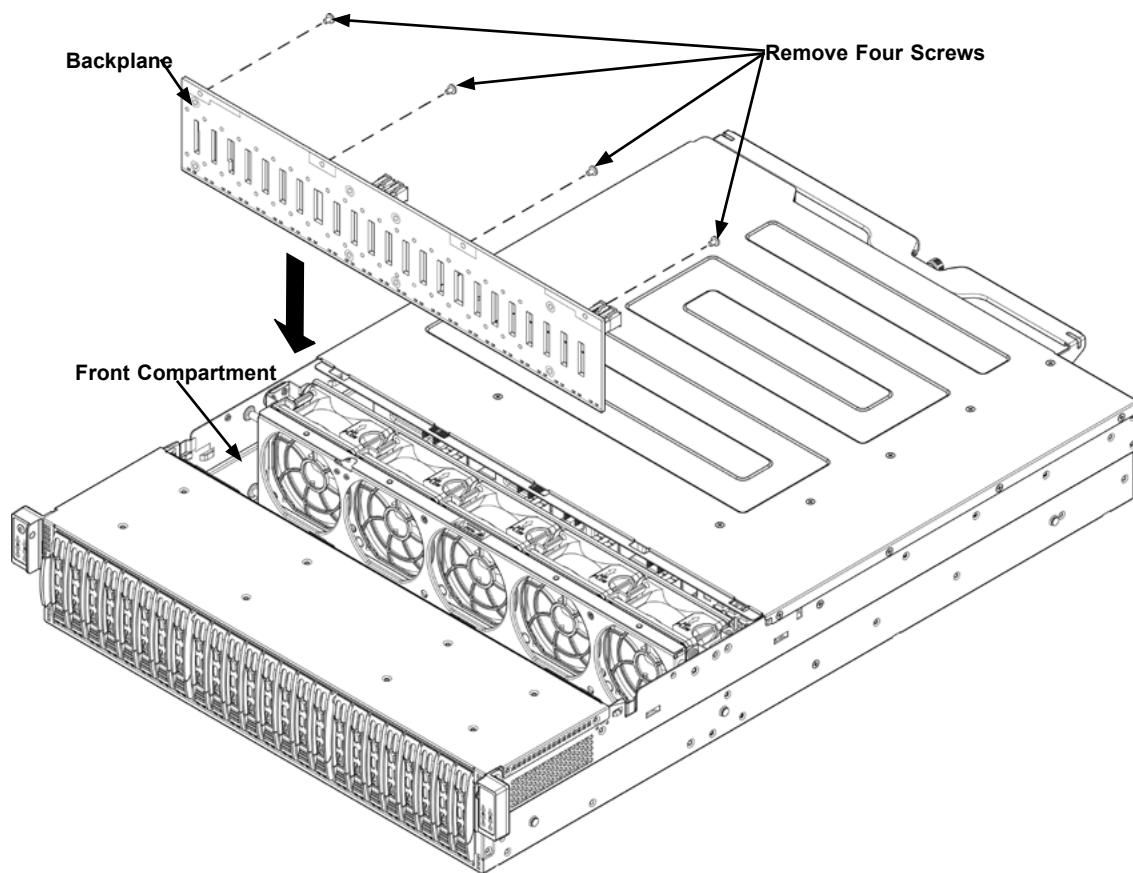


**Figure 3-14. Removing the Front Backplane**

## ***Installing the Backplane***

### ***Installing the Backplane Into the Chassis***

1. Power down the system and remove the power cords as described in Section 3-1. Open the chassis covers as described in Section 3-2.
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.



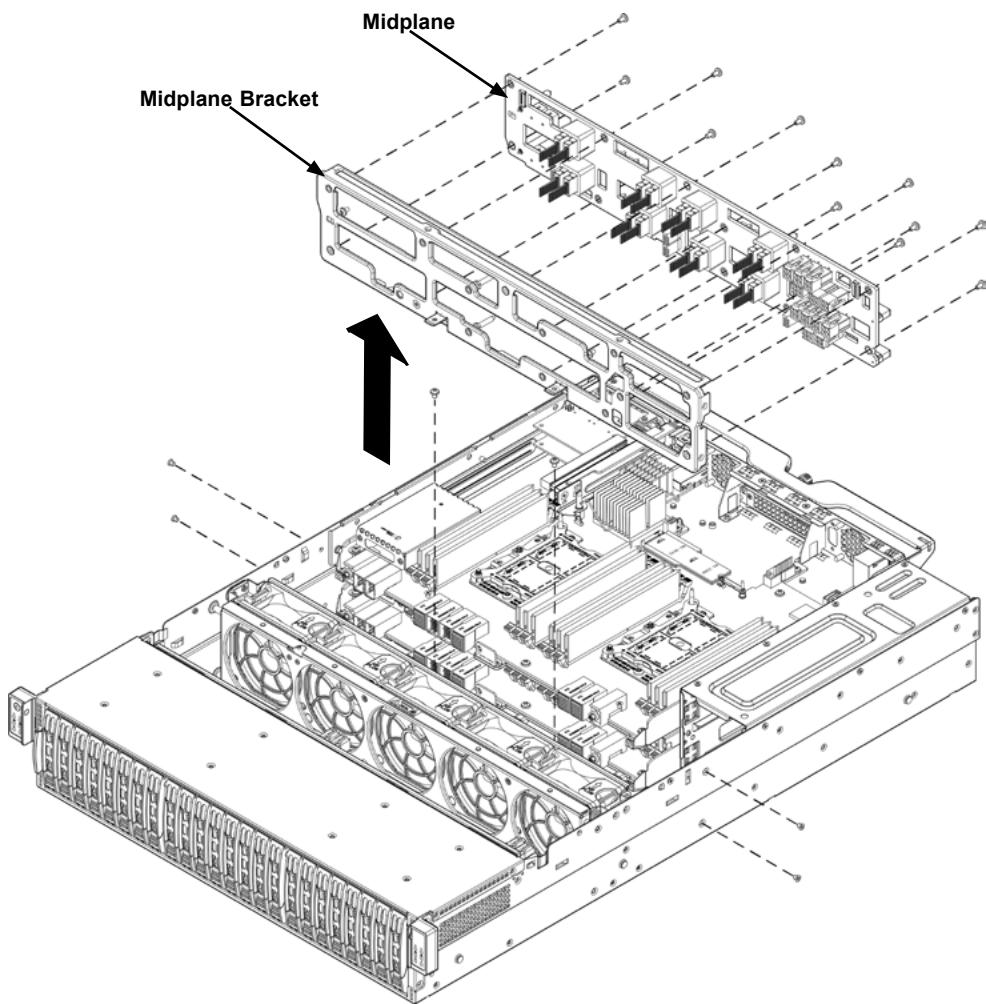
**Figure 3-15. Installing the Front Backplane**

## Removing and Installing the Midplane

### ***Removing the Midplane***

#### ***Removing the Midplane from the Chassis***

1. Power down the system as described in Section 3-1 and open the chassis covers as described in Section 3-2.
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.

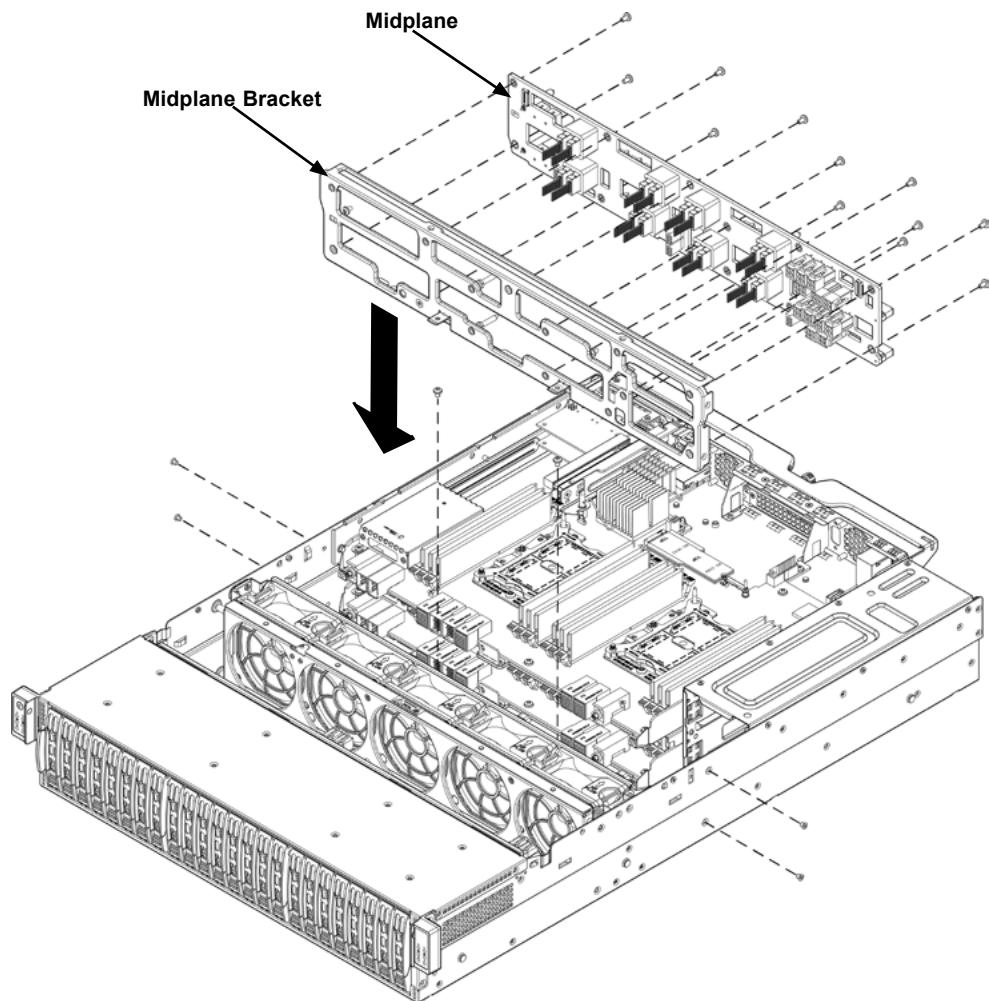


**Figure 3-16. Installing the Midplane**

## ***Installing the Midplane***

### ***Installing the Midplane Into the Chassis***

1. Power down the system as described in Section 3-1 and open the chassis covers as described in Section 3-2.
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 3-17. Installing the Midplane**

# Chapter 4

## Motherboard Connections

This section describes the connections on the motherboard and provides pinout definitions. Note that depending on how the system is configured, not all connections are required. The LEDs on the motherboard are also described here. A serverboard layout indicating component locations may be found in Chapter 1.

Please review the Safety Precautions in Chapter 3 before installing or removing components.

### 4.1 Headers and Connectors

#### Onboard Fan Header

Two 4-pin fan headers (FAN1/FAN2) are located on the motherboard to provide CPU/system cooling. These fan headers support both 3-pin fans and 4-pin fans; however, onboard fan speed control is available only when all 4-pin fans are used in the motherboard. Fan speed control is supported by a thermal management setting in the BMC (Baseboard Management Controller). See the table below for pin definitions.

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

#### Super I/O Module (SIOM)

A Supermicro proprietary Super I/O module is located at JSIOM1. This I/O module supports a PCI-E 3.0 x16 add-on card on the X11DSN-TS.

#### TPM Header

The JTPM1 header is used to connect a Trusted Platform Module TPM/Port 80, which is available from a third-party vendor. A TPM/Port 80 connector is a security device that supports encryption and authentication in hard drives. It allows the motherboard to deny access if the TPM associated with the hard drive is not installed in the system.

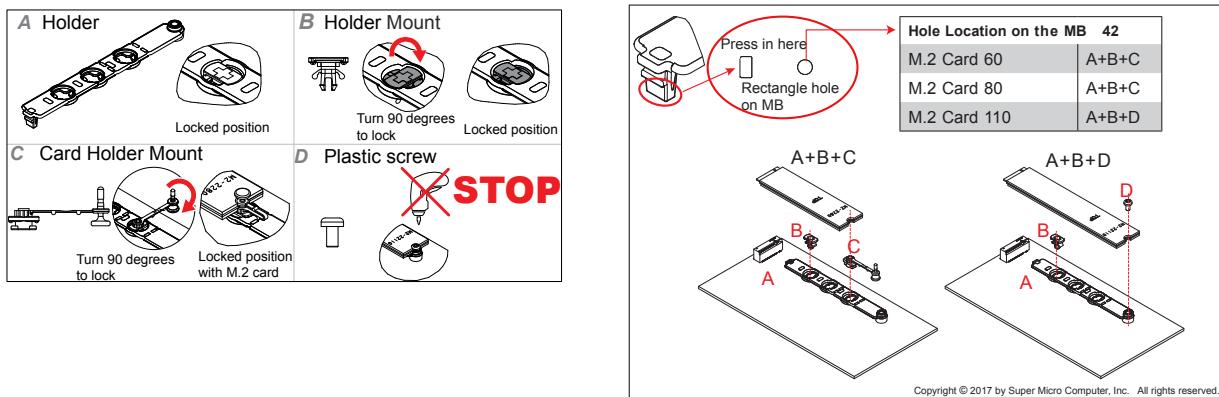
## SATA Power Connectors

The SATA power connectors at JSD1 and JSD2 provide 5V power to onboard SATA devices. Refer to the table below for pin definitions.

SATA Power Pin Definitions	
Pin#	Definition
1	5V
2	Ground
3	Ground

## PCI-E M.2 Slot

The X11DSN-TS motherboard has one PCI-E M.2 slot. M.2 was formerly Next Generation Form Factor (NGFF) and serves to replace mini PCI-E. M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. The M.2 socket on the motherboard supports PCI-E 3.0 x4 (32 Gb/s) SSD cards in the 2280 form factors.



## S-SATA 3.0 Ports

Two S-SATA 3.0 ports (S-SATA0/ S-SATA1) that are supported by the Intel C624 chipset are located on the motherboard. These two S-SATA ports have power pins built in and can be used with Supermicro SuperDOMs which do not need external power cable support. Supermicro SuperDOMs are backward-compatible with regular SATA HDDs or SATA DOMs that need external power cables.

## VGA Port

The onboard VGA port is located next to the SIOM slot on the motherboard. Use this connection for VGA display.

## 4.2 Ports

### Rear I/O Ports

See Figure 4-1 below for the locations and descriptions of the various I/O ports on the rear of the motherboard.

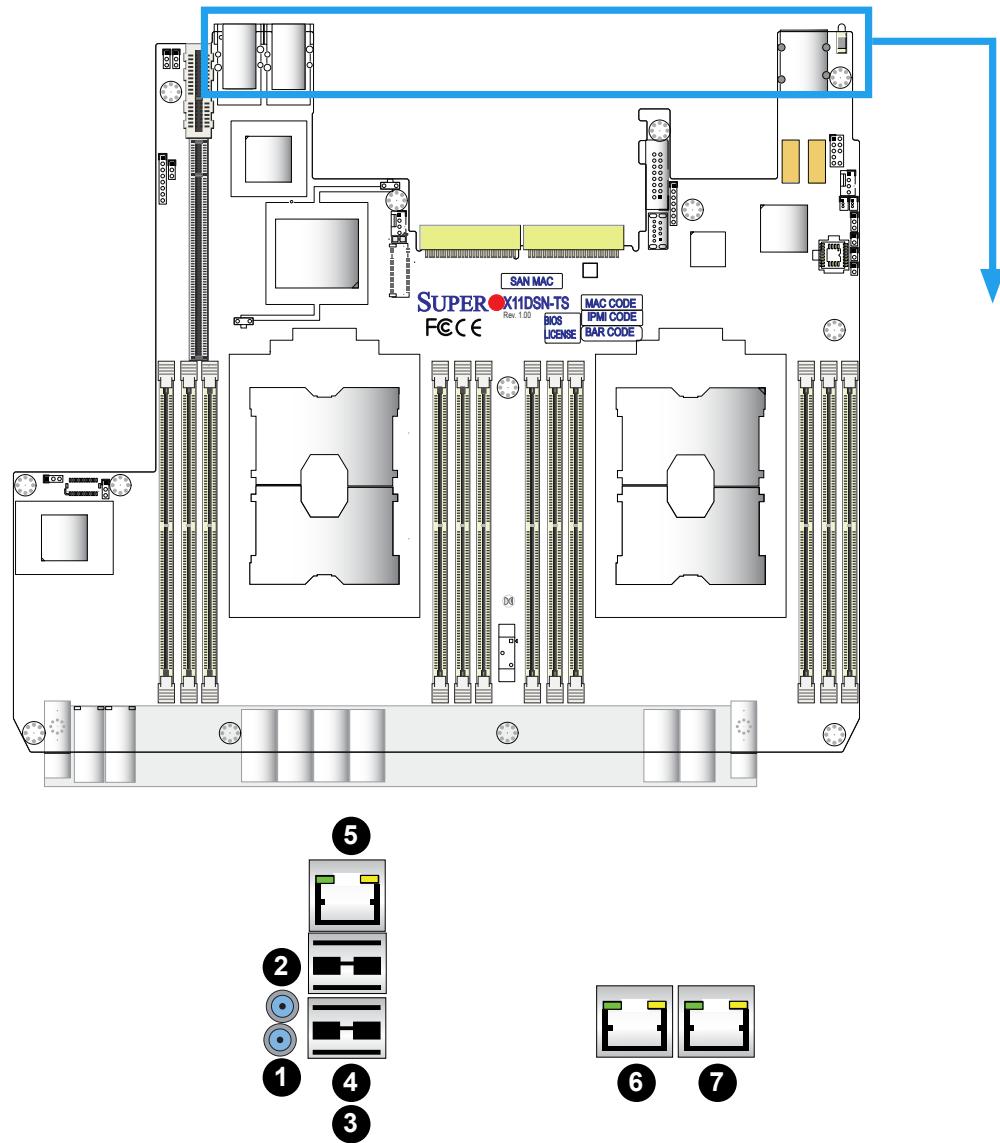


Figure 4-1. Back panel I/O Port Locations and Definitions

Back Panel I/O Ports			
No.	Description	No.	Description
1.	LEDL (LED-Bottom: System HeartBeat LED)	5.	IPMI LAN
2.	LEDH (LED-Top: BMC HeartBeat LED)	6.	10GbE LAN1
3.	USB 0 (USB 3.0)	7.	10GbE LAN2
4.	USB 1 (USB 3.0)		

## Universal Serial Bus (USB) Ports

There are two USB 3.0 port (USB 0/1) on the I/O back panel, and a Type A USB 3.0 header (USB 2) on the motherboard to provide front access USB connection. The onboard headers can be used to provide front side USB access with a cable (not included).

Back Panel USB 0/1 (3.0) Pin Definitions			
Pin#	Definition	Pin#	Definition
A1	VBUS	B1	Power
A2	D-	B2	USB_N
A3	D+	B3	USB_P
A4	GND	B4	GND
A5	Stda_SSRX-	B5	USB3_RN
A6	Stda_SSRX+	B6	USB3_RP
A7	GND	B7	GND
A8	Stda_SSTX-	B8	USB3_TN
A9	Stda_SSTX+	B9	USB3_TP

Type A USB 2 (3.0) Pin Definitions			
Pin#	Definition	Pin#	Definition
1	VBUS	5	SSRX-
2	USB_N	6	SSRX+
3	USB_P	7	GND
4	Ground	8	SSTX-
		9	SSTX+

## Ethernet Ports

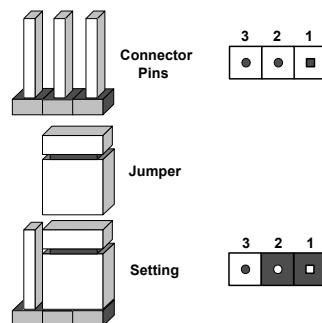
Two Ethernet ports (LAN1, LAN2) are located on the I/O backplane. These Ethernet ports support 10GbE LAN connections on the motherboard. In addition, an dedicated IPMI LAN that supports GbE LAN is located above the USB 0/1 ports on the backplane. All Ethernet ports accept RJ45 type cables. Please refer to the LED Indicator Section for LAN LED information.

## 4.3 Jumpers

### ***Explanation of Jumpers***

To modify the operation of the motherboard, jumpers are used to choose between optional settings. Jumpers create shorts between two pins to change the function associated with it. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout page for jumper locations.

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



### **CMOS Clear**

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

#### **To Clear CMOS**

1. First power down the system and unplug the power cord(s).
2. Remove the cover of the chassis to access the motherboard.
3. Remove the onboard battery from the motherboard.
4. Short the CMOS pads with a metal object such as a small screwdriver for at least four seconds.
5. Remove the screwdriver (or shorting device).
6. Replace the cover, reconnect the power cord(s) and power on the system.

**Notes:** Clearing CMOS will also clear all passwords.

*Do not use the PW\_ON connector to clear CMOS.*



### VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default setting is Enabled.

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

### Manufacturing Mode Select (ME Select)

Close JPME2 to bypass SPI flash security and force the system to use the Manufacturing Mode, which will allow you to flash the system firmware from a host server to modify system settings. See the table below for jumper settings.

Manufacturing Mode Select Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	Manufacturing Mode

### I<sup>2</sup>C Bus for VRM

Jumpers JVRM1 and JVRM2 allow the VRM SMBus Clock and Data to access the BMC. See the table below for jumper settings.

I <sup>2</sup> C Bus for VRM Jumper Settings		
VRM Jumpers	Jumper Setting	Definition
JVRM1	On	VRM SMB Clock to BMC (Normal)
JVRM2	On	VRM SMB Data to BMC (Normal)

## NTB Enable

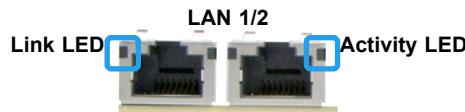
Use Jumper (JPX) to enable or disable onboard Non-Transparent Bridge (NTB) support. The default setting is Enabled.

NTB Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

## 4.4 LED Indicators

### LAN LEDs

The LAN ports are located on the I/O Backplane on the motherboard. Each Ethernet LAN port has two LEDs. The yellow LED indicates activity. Link LED, located on the left side of the LAN port, may be green, amber or off indicating the speed of the connection. See the tables below for more information.



LAN Activity Indicator (Left) LED Settings		
Color	State	Definition
Yellow	Flashing	Active

LAN Link Indicator LED Settings	
LED Color	Definition
Off	No Connection, 10 or 100 Mbps
Green	10 Gbps
Amber	1 Gbps

### Dedicated IPMI LAN LEDs

In addition to LAN 1/LAN 2, a dedicated IPMI LAN is located on the I/O Backplane of the motherboard. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the table below for more information.



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

### System Heartbeat LED

LEDL (the bottom LED indicator) on the I/O back panel is used as the system heartbeat LED. When the LED is blinking, your system functions normally. See the table below for the LED status.

System Heartbeat LED Indicator		
LED	LED State	Definition
LEDL (the bottom LED)	Blinking	System Normal

### BMC Heartbeat LED

LEDH (the top LED indicator) on the I/O back panel is used as the BMC heartbeat LED. When the LED is blinking green, BMC is normal. See the table below for the LED status.

BMC Heartbeat LED Indicator		
LED	LED State	Definition
LEDH (the top LED)	Green: Blinking	BMC Normal

### PCI-E M.2 Slot Activity LED (LEDM.2)

The Activity LED indicator for onboard PCI-E M.2 slot is located at LEDM.2. When this LED is on, M.2 is active. See the layout below for for LED status.

Activity LED Indicator for PCI-E M.2 Slot		
LED	LED State	Definition
LEDM.2	On	PCI-E M.2 Slot: Active

# Chapter 5

## Software

After the hardware has been installed, you can install the Operating System (OS), configure RAID settings and install the drivers.

### 5.1 Microsoft Windows OS Installation

If you will be using RAID, you must configure RAID settings before installing the Windows OS and the RAID driver. Refer to the RAID Configuration User Guides posted on our website at [www.supermicro.com/support/manuals](http://www.supermicro.com/support/manuals).

#### *Installing the OS*

1. Create a method to access the MS Windows installation ISO file. That might be a DVD, perhaps using an external USB/SATA DVD drive, or a USB flash drive, or the IPMI KVM console.
2. Retrieve the proper RST/RSTe driver. Go to the Supermicro web page for your motherboard and click on "Download the Latest Drivers and Utilities", select the proper driver, and copy it to a USB flash drive.
3. Boot from a bootable device with Windows OS installation. You can see a bootable device list by pressing **F11** during the system startup.

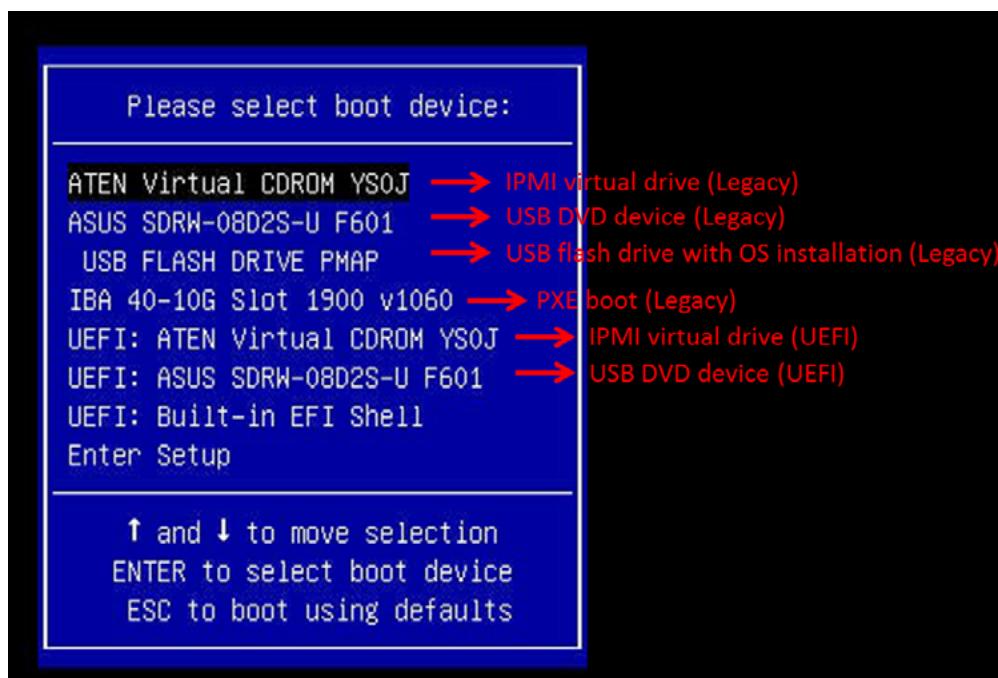
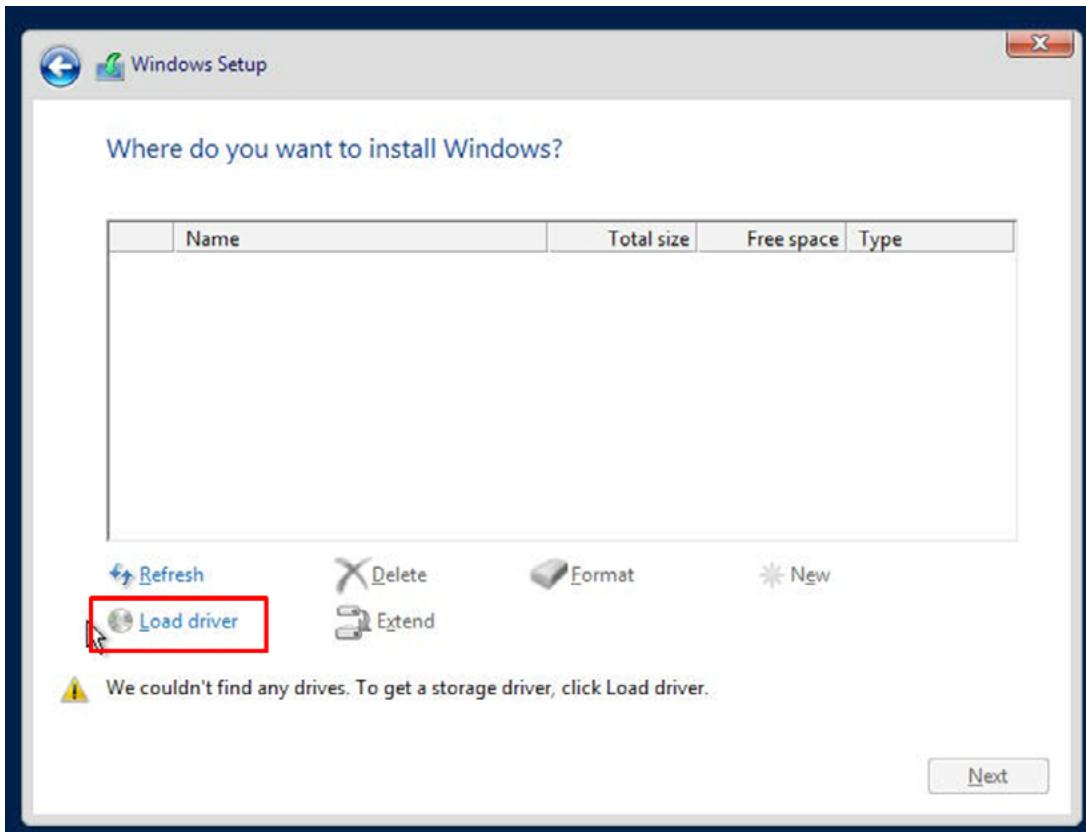


Figure 5-1. Select Boot Device

4. During Windows Setup, continue to the dialog where you select the drives on which to install Windows. If the disk you want to use is not listed, click on “Load driver” link at the bottom left corner.



**Figure 5-2. Load Driver Link**

To load the driver, browse the USB flash drive for the proper driver files.

- For RAID, choose the SATA/sSATA RAID driver indicated then choose the storage drive on which you want to install it.
- For non-RAID, choose the SATA/sSATA AHCI driver indicated then choose the storage drive on which you want to install it.

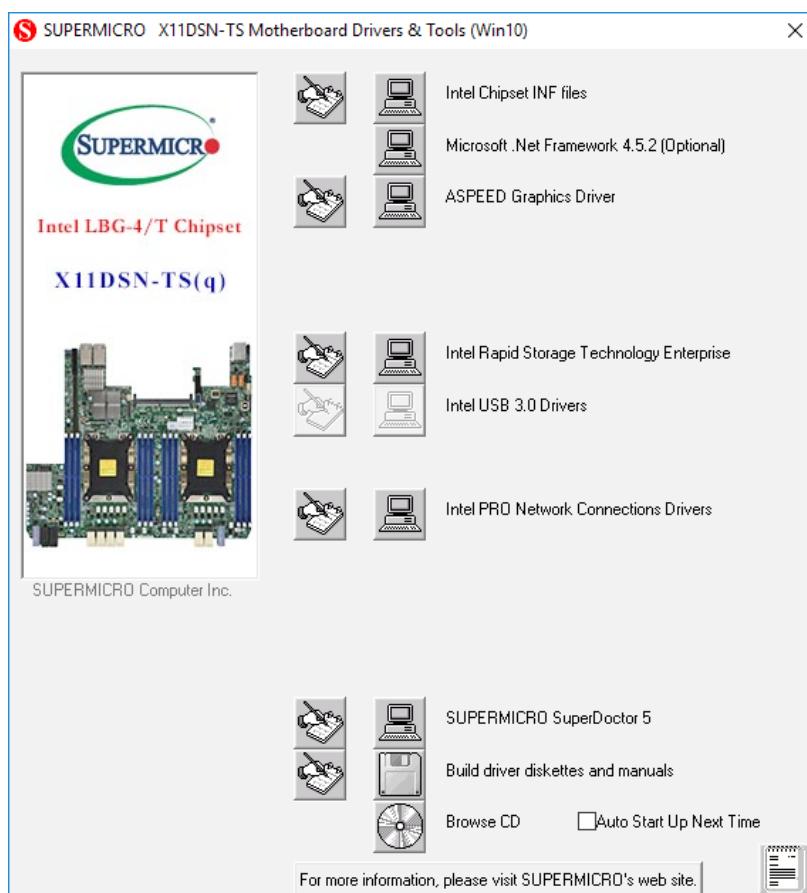
5. Once all devices are specified, continue with the installation.
6. After the Windows OS installation has completed, the system will automatically reboot multiple times.

## 5.2 Driver Installation

The Supermicro website contains drivers and utilities for your system at <https://www.supermicro.com/wdl/driver>. Some of these must be installed, such as the chipset driver.

After accessing the website, go into the CDR\_Images (in the parent directory of the above link) and locate the ISO file for your motherboard. Download this file to a USB flash drive or a DVD. (You may also use a utility to extract the ISO file if preferred.)

Another option is to go to the Supermicro website at <http://www.supermicro.com/products/>. Find the product page for your motherboard, and "Download the Latest Drivers and Utilities". Insert the flash drive or disk and the screenshot shown below should appear.



**Figure 5-3. Driver & Tool Installation Screen**

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

## 5.3 SuperDoctor® 5

The Supermicro SuperDoctor 5 is a program that functions in a command-line or web-based interface for Windows and Linux operating systems. The program monitors such system health information 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. SuperDoctor 5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.

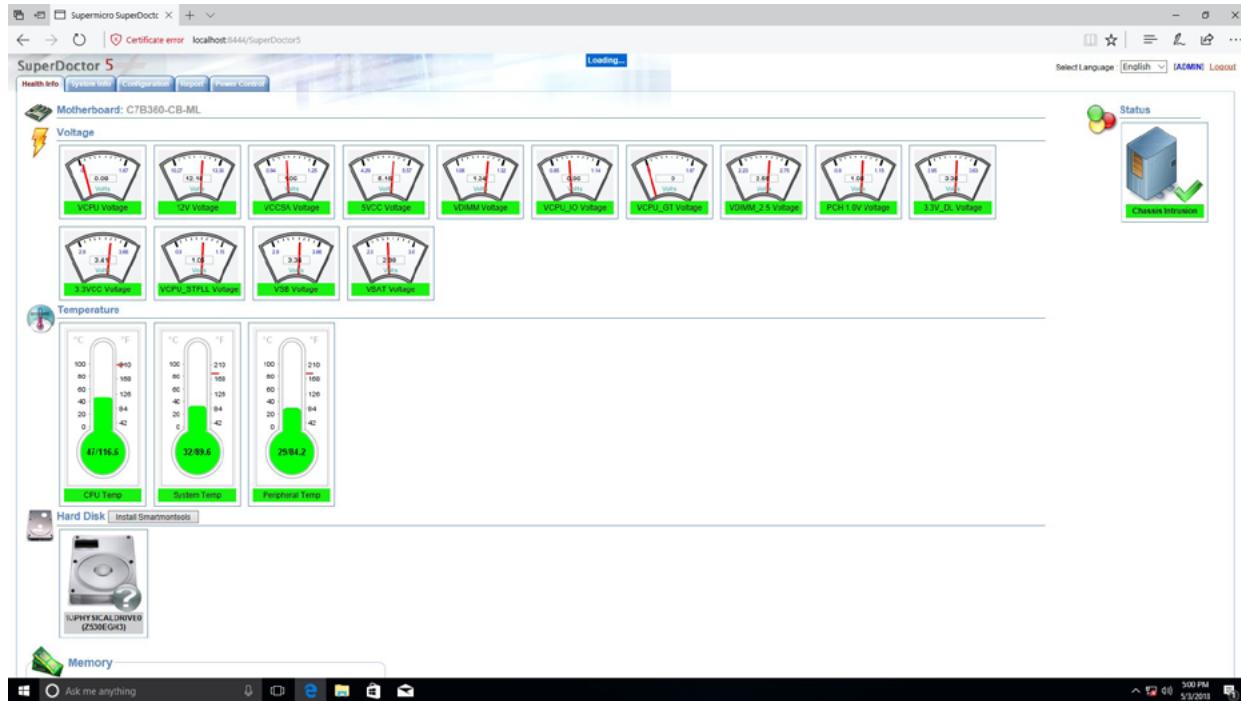


Figure 5-4. SuperDoctor 5 Interface Display Screen (Health Information)

## 5.4 IPMI

The X11DSN-TS supports the Intelligent Platform Management Interface (IPMI). IPMI is used to provide remote access, monitoring and management. There are several BIOS settings that are related to IPMI.

Supermicro ships standard products with a unique password for the BMC ADMIN user. This password can be found on a label on the motherboard. For general documentation and information on IPMI, please visit our website at: <http://www.supermicro.com/products/info/IPMI.cfm>.

# Chapter 6

## UEFI BIOS

### 6.1 Introduction

This chapter describes the AMIBIOS™ Setup utility for the X11DSN-TS motherboard(s). The BIOS is stored in a flash chip and can be easily upgraded.

**Note:** Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of our website for any changes to BIOS that may not be reflected in this manual.

#### Starting the Setup Utility

To enter the BIOS Setup Utility, hit the **<Delete>** key while the system is booting-up. (In most cases, the **<Delete>** key is used to invoke the BIOS setup screen. There are a few cases when other keys are used, such as **<F1>**, **<F2>**, etc.) Each main BIOS menu option is described in this manual.

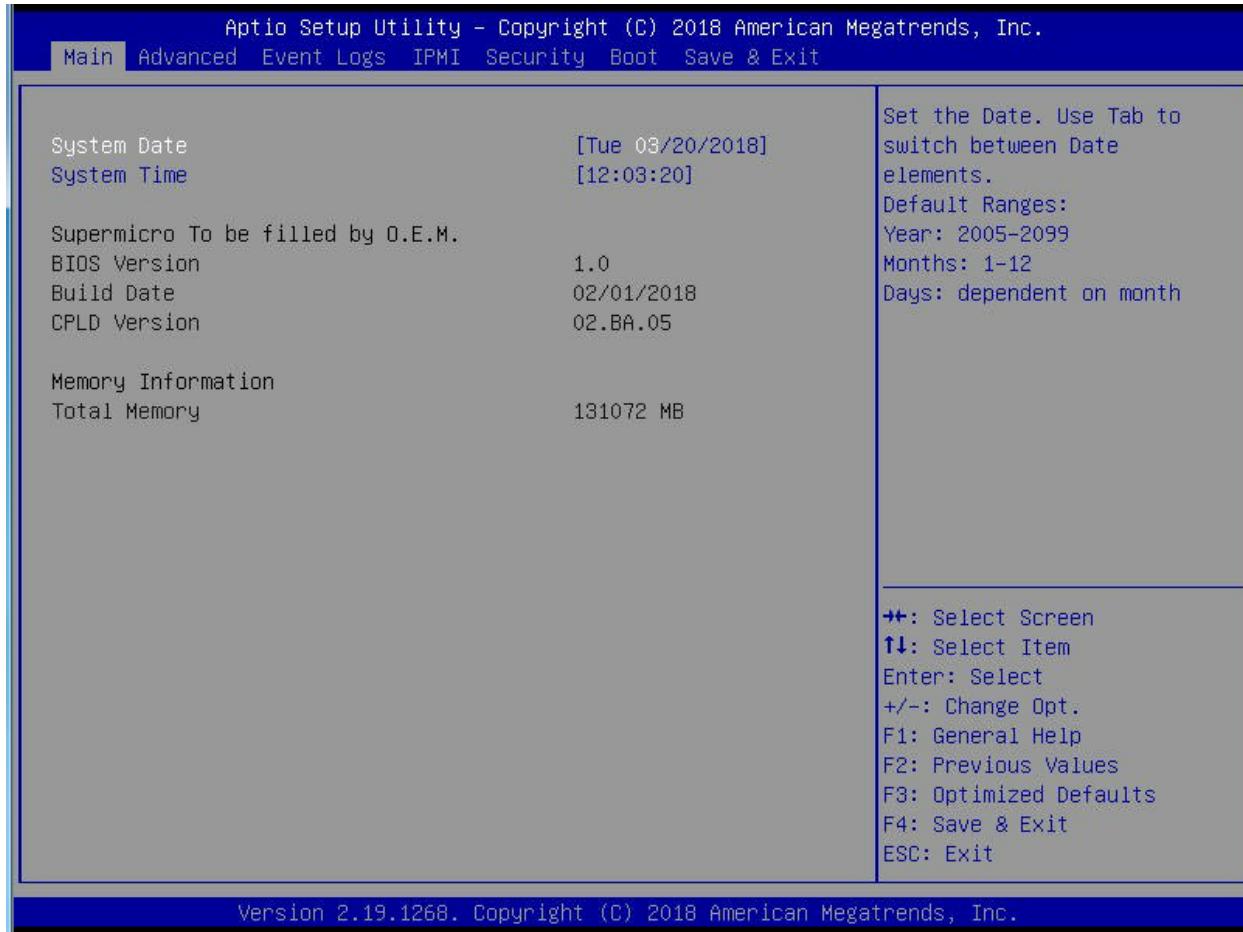
The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note that BIOS has default text messages built in. We retain the option to include, omit, or change any of these text messages.) Settings printed in **Bold** are the default values.

A “►” indicates a submenu. Highlighting such an item and pressing the **<Enter>** key will open the list of settings within that submenu.

The BIOS setup utility uses a key-based navigation system called hot keys. Most of these hot keys (**<F1>**, **<F10>**, **<Enter>**, **<ESC>**, **<Arrow>** keys, etc.) can be used at any time during the setup navigation process.

## 6.2 Main Menu

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 feature to change the system date and time. Highlight *System Date* or *System Time* using the arrow keys on the keyboard. Press the *<Tab>* key or the arrow keys to move between fields. The date must be entered in Day 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. The date's default value is 01/01/2014 after RTC reset.

### Supermicro X11DSN-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 Version

This item displays the version of the CPLD (Complex-Programmable Logical Device) used in the system.

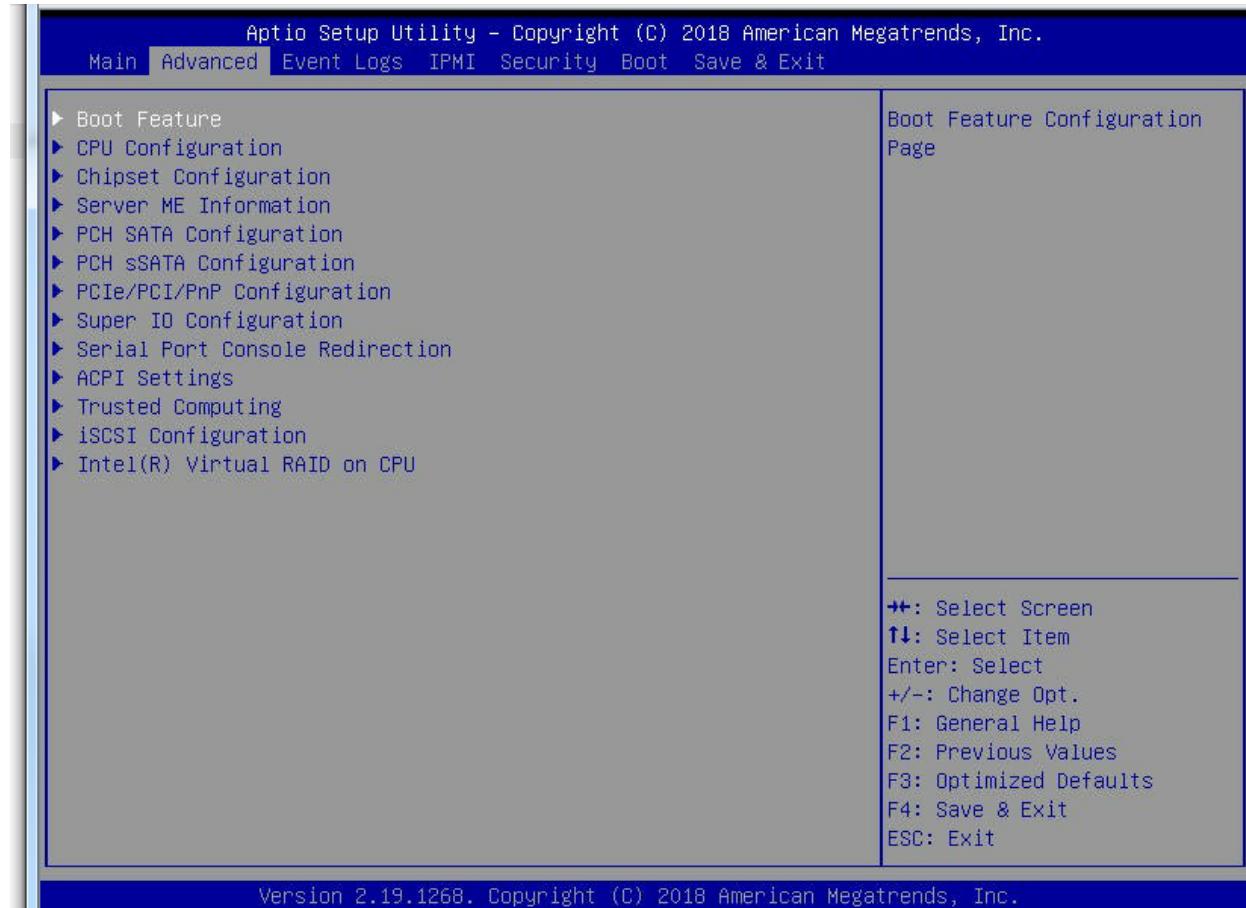
### Memory Information

#### Total Memory

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

## 6.3 Advanced Settings Menu

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



**Warning:** Take Caution when changing the Advanced settings. An incorrect value, an incorrect 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 feature to select the screen between displaying 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**.

**Note:** POST message is always displayed regardless of the item setting.

### **Option ROM Messages**

Use this feature 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 display mode set by the system BIOS. The options are **Force BIOS** and **Keep Current**.

### **Bootup NumLock State**

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

### **Wait For 'F1' If Error**

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

### **INT19 Trap Response**

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

### **Re-try Boot**

When **EFI (Expansible Firmware Interface) Boot** is selected, the system BIOS will automatically reboot the system from an EFI boot device after an initial boot failure. Select **Legacy Boot** to allow the BIOS to automatically reboot the system from a Legacy boot device after an initial boot failure. The options are **Disabled**, **Legacy Boot**, and **EFI Boot**.

### **Install Windows 7 USB Support**

Select Enabled to install Windows 7 and the XHCI drivers for USB keyboard/mouse support. After you've installed the Windows 7 and XHCI drivers, be sure to set this feature to "Disabled" (default). The options are **Disabled** and **Enabled**.

### **Port 61h Bit-4 Emulation**

Select Enabled for I/O Port 61h-Bit 4 emulation support to enhance system performance. The options are **Enabled** and **Disabled**.

## Power Configuration

### 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**.

### 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 Stay-Off, Power-On, and **Last State**.

### Power Button Function

This feature controls how the system shuts down when the power button is pressed. Select 4 Seconds Override for the user to power off the system after pressing and holding 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**.

### Throttle on Power Fail

Select Enabled to decrease system power input by throttling CPU frequency when the power supply fails. The options are Enabled and **Disabled**.

### System Firmware Progress Log

Select Enabled to use the system firmware log, which will allow your system to log the progress of the firmware of the system. The options are Enabled and **Disabled**.

## ►CPU Configuration

**Warning:** Setting the wrong values in the following sections may cause the system to malfunction.

## ►Processor Configuration

The following CPU information will be displayed:

- Processor BSP Revision
- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ratio

- Processor Min Ratio
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- Processor 0 Version/Processor 1 Version

### **Hyper-Threading (ALL)**

Select Enable to use Intel Hyper-Threading Technology to enhance CPU performance. The options are **Enable** and Disable.

### **Core Disable Bitmap (Hex)**

Use this feature to enable or disable CPU cores in the processor specified by the user. Enter 0 to enable all cores available in the processor. Enter bit0 to disable CPU Core 0. Enter bit1 to disable CPU Core 1. Please note that the maximum of 24 CPU cores are currently available in each CPU package. The default setting is **0**.

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

Select Enable to keep mixed power-on frequency of each CPU socket. The options are **Enable** and Disable.

### **Intel Virtualization Technology**

Select Enable to use Intel Virtualization Technology which will allow the I/O device assignments to be directly reported to the VMM (Virtual Memory Management) through the DMAR ACPI tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are **Enable** and Disable.

### **PPIN Control**

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

### **Hardware Prefetcher (Available when supported by the CPU)**

If this feature is set to Enable, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the Level 2 (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 power off and reboot the system for the changes you've made 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 this feature is set to Enable, the DCU (Data Cache Unit) streamer prefetcher will prefetch data streams from the cache memory to the DCU (Data Cache Unit) to speed up data accessing and processing for CPU performance enhancement. The options are Disable and **Enable**.

### **DCU (Data Cache Unit) IP Prefetcher**

If this feature is 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.

### **LLC Prefetch**

If this feature is set to Enable, LLC (hardware cache) prefetching on all threads will be supported. The options are **Disable** and Enable.

### **Extended APIC (Extended Advanced Programmable Interrupt Controller)**

Based on the Intel Hyper-Threading technology, 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 be expanded 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.

## **►Advanced Power Management Configuration**

### **Power Technology**

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

### **Power Performance Tuning (Available when "Power Technology" is set to Custom)**

Select BIOS to allow the system BIOS to configure the Power-Performance Tuning Bias setting below. The options are BIOS Controls EPB and **OS Controls EPB**.

### **Energy Performance BIAS Setting (Available when "Power Performance Tuning" is set to BIOS Controls EPB)**

Use this feature to set the processor power use policy to achieve the desired operation settings for your machine by prioritizing system performance or energy savings. Select Maximum Performance to maximize system performance (to its highest potential); however, this may result in maximum power consumption as energy is needed to fuel the processor frequency. The higher the performance is, the higher the power consumption will be. Select Max Power Efficient to maximize power saving; however, system performance may be substantially impacted because limited power use decreases the processor frequency. The options are Maximum Performance, Performance, **Balanced Performance**, Balanced Power, Power, and Max Power Efficient.

## **►CPU P State Control**

### **SpeedStep (PStates)**

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

### **EIST PSD Function (Available when SpeedStep is set to Enable)**

Use this item to configure the processor's P-State coordination settings. During a P-State, the voltage and frequency of the processor will be reduced when it is in operation. This makes the processor more energy efficient, resulting in further energy gains. The options are **HW\_ALL**, **SW\_ALL** and **SW-ANY**.

### **Turbo Mode (Available when SpeedStep is set to Enable)**

Select Enable for processor cores to run faster than the frequency specified by the manufacturer. The options are Disable and **Enable**.

## **►Hardware PM (Power Management) State Control**

### **Hardware P-States**

If this feature is set to Disable, hardware will choose a P-state setting for the system based on an OS request. If this feature is set to Native Mode, hardware will choose a P-state setting based on OS guidance. If this feature is set to Native Mode with No Legacy Support, hardware will choose a P-state setting independently without OS guidance. The options are **Disable**, **Native Mode**, **Out of Band Mode**, and **Native Mode with No Legacy Support**.

## ►CPU C State Control

### Autonomous Core C-State

Select Enable to support Autonomous Core C-State control which will allow the processor core to control its C-State setting automatically and independently. The options are Enable and **Disable**.

### CPU C6 Report

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 caches is turned off. The options are **Auto**, Enable, and Disable.

### Enhanced Halt State (C1E)

Select Enable to enable "Enhanced Halt State" support, which will significantly reduce the CPU's power consumption by minimizing CPU's clock cycles and reduce voltage during a "Halt State." The options are Disable and **Enable**.

## ►Package C State Control

### Package C State

Use this feature to set the limit on the C-State package register. The options are C0/1 state, C2 state, C6 (non-Retention) state, C6 (Retention) state, No Limit, and **Auto**.

## ►CPU T State Control

### Software Controlled T-States

If this feature is set to Enable, CPU throttling settings will be supported by the software of the system. The options are Disable and **Enable**.

## ►Chipset Configuration

### ►North Bridge

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

### ►UPI (Ultra Path Interconnect) General Configuration

This section displays the following UPI General Configuration information:

- Number of CPU
- Number of Active UPI Link
- Current UPI Link Speed
- Current UPI Link Frequency
- UPI Global MMIO Low Base/Limit
- UPI Global MMIO High Base/Limit
- UPI PCI-E Configuration Base/Size

#### Degrade Precedence

Use this feature to select the degrading precedence option for Ultra Path Interconnect connections. Select Topology Precedent to degrade UPI features if system options are in conflict. Select Feature Precedent to degrade UPI topology if system options are in conflict. The options are **Topology Precedence** and Feature Precedence.

#### Link L0p Enable

Select Enable to enable Link L0p. The options are Disable, Enable, and **Auto**.

#### Link L1 Enable

Select Enable to enable Link L1 (Level 1 link). The options are Disable, Enable, and **Auto**.

#### IO Directory Cache (IODC)

Select Enable for the IODC (I/O Directory Cache) to generate snoops instead of generating memory lockups for remote IIO (InvIToM) and/or WCiLF (Cores). Select Auto for the IODC to generate snoops (instead of memory lockups) for WCiLF (Cores). The options are Disable, **Auto**, Enable for Remote InvIToM Hybrid Push, InvIToM AllocFlow, Enable for Remote InvIToM Hybrid AllocNonAlloc, and Enable for Remote InvIToM and Remote WVLF.

### **SNC (Sub NUMA Cluster)**

Select Enable for Sub-NUMA (Non-uniform memory access) Cluster support. Select Auto for 1-cluster or 2-cluster support depending on the status of IMC (Integrated Memory Controller) Interleaving. The options are **Disable**, **Enable**, and **Auto**.

### **XPT Prefetch**

Select Enable for Extended (Xtended) Prediction Table (XPT) Prefetch support which will allow a read request to be sent to the memory controller requesting the prefetch in parallel to an LLC (Last Level Cache) look-up. The options are **Disable** and **Enable**.

### **KTI Prefetch**

Select Enable to allow the memory read to start early on a DDR bus. The options are **Enable** and **Disable**.

### **Local/Remote Threshold**

Use this feature to configure the threshold settings for local and remote systems that are connected in the network. The options are **Disable**, **Auto**, **Low**, **Medium**, and **High**.

### **Stale AtoS (A to S)**

Select Enable to remove the contents and the structures of the files that are no longer needed in the remote host server but are still in use by the local client machine from Directory A to Directory S in the NFS (Network File System) to optimize system performance. The options are **Disable**, **Enable**, and **Auto**.

### **LLC Dead Line Alloc**

Select Enable to opportunistically fill the deadlines in LLC (Last Level Cache). The options are **Enable**, **Disable**, and **Auto**.

### **Isoc Mode**

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

## **►Memory Configuration**

### **Enforce POR**

Select POR to enforce POR restrictions for DDR4 memory frequency and voltage programming. The options are **POR** and **Disable**.

### **Memory Frequency**

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 1866, 2000, 2133, 2200, 2400, 2600, and 2666.

### **Data Scrambling for NVDIMM**

Select Enable to enable data scrambling for onboard NVDIMM memory to enhance system performance and security. The options are **Auto**, Disable, and Enable.

### **Data Scrambling for DDR4**

Select Enable to enable data scrambling for DDR4 memory to enhance system performance and security. The options are **Auto**, Disable, and Enable.

### **tCCD\_L Relaxation**

If this feature is enabled, SPD (Serial Presence Detect) will override tCCD\_L ("Column to Column Delay-Long", or "Command to Command Delay-Long" on the column side.) If this feature is set to Disable, tCCD\_L will be enforced based on the memory frequency. The options are Disable, Enable, and **Auto**.

### **Enable ADR**

Select Enable for ADR (Automatic Diagnostic Repository) support to enhance memory performance. The options are Enable and **Disable**.

### **2X Refresh**

Select Enable for memory 2X refresh support to enhance memory performance. The options are Enable and **Auto**.

### **Page Policy**

Use this feature to set the page policy for onboard memory support. The options are Closed, Adaptive, and **Auto**.

### **IMC Interleaving**

Use this feature to configure interleaving settings for the IMC (Integrated Memory Controller), which will improve memory performance. The options are 1-way Interleaving, 2-way Interleaving, and **Auto**.

## **►Memory Topology**

This item displays the information of onboard memory modules as detected by the BIOS.

- P1DIMMA1/P1DIMMA2; P1DIMMB1/P1DIMMB2; P1DIMMC1/P1DIMMC2, P1DIMMD1/P1DIMMD2; P1DIMME1/P1DIMME2; P1DIMMF1/P1DIMMF2
- P2DIMMA1/P2DIMMA2; P2DIMMB1/P2DIMMB2; P2DIMMC1/P2DIMMC2, P2DIMMD1/P2DIMMD2; P2DIMME1/P2DIMME2; P2DIMMF1/P2DIMMF2

## ►Memory RAS (Reliability\_Availability\_Serviceability) Configuration

Use this submenu to configure the following Memory RAS settings.

### Static Virtual Lockstep Mode

Select Enable to support the Static Virtual Lockstep mode to enhance memory performance. The options are Enable and **Disable**.

### Mirror Mode

Use this feature to configure the mirror mode settings for all 1LM/2LM memory modules installed in the system which will create a duplicate copy of data stored in the memory to increase memory security, but it will reduce the memory capacity into half. The options are **Disable**, Mirror Mode 1LM, and Mirror Mode 2LM.

### UEFI ARM Mirror

If this feature is set to Enable, mirror mode configuration settings for UEFI-based Address Range memory will be activated upon system boot. This will create a duplicate copy of data stored in the memory to increase memory security, but it will reduce the memory capacity into half. The options are **Disable** and Enable.

### Memory Rank Sparing

Select Enable to support memory-rank sparing to optimize memory performance. The options are Enable and **Disable**.

**Note:** This item will not be available when memory mirror mode is enabled.

### Correctable Error Threshold

Use this item to enter the threshold value for correctable memory errors. The default setting is **10**.

### Intel Run Sure (Available when this feature is supported by the CPU)

Select Enable to support Intel® Run Sure Technology to further enhance critical data protection and to increase system uptime and resiliency. The options are Enable and **Disable**.

### SDDC Plus One (Available when this feature is supported by the CPU & the item: Intel Run Sure is set to Disable)

SDDC (Single Device Data Correction) checks and corrects single-bit or multiple-bit (4-bit max.) memory faults that affect an entire single x4 DRAM device. SDDC Plus One is the enhanced feature to SDDC. SDDC+1 will spare the faulty DRAM device out after an SDDC event has occurred. After the event, the SDDC+1 ECC mode is activated to protect against any additional memory failure caused by a 'single-bit' error in the same memory rank. The options are **Disable** and **Enable\***. (The option "Enable" can be set as default when it is supported by the motherboard.)

## **ADDDC (Adaptive Double Device Data Correction) Sparing**

Select Enable for Adaptive Double Device Data Correction (ADDDC) support, which will not only provide memory error checking and correction but will also prevent the system from issuing a performance penalty before a device fails. Please note that virtual lockstep mode will only start to work for ADDDC after a faulty DRAM module is spared. The options are **Enable\*** and **Disable**. (The option "Enable" can be set as default when it is supported by the motherboard.)

### **Patrol Scrub**

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected in 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**

Use this item to specify the number of hours (between 0 to 24) required for the system to complete a full patrol scrubbing. Enter 0 for patrol scrubbing to be performed automatically. The default setting is **24**.

**Note:** This item is hidden when Patrol Scrub item is set to Disable.

## **►IIO Configuration**

### **EV DFX (Device Function On-Hide) Features**

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

## **►CPU1 Configuration/CPU2 Configuration**

### **IOU0 (IIO PCIe Br1)**

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

### **IOU1 (IIO PCIe Br2)**

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

### **IOU2 (IIO PCIe Br3)**

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

### **MCP0 (IIO PCIe Br4)**

This feature configures the PCI-E Bifurcation setting for a PCI-E port specified by the user. The options are x16 and **Auto**.

### **MCP1 (IIO PCIe Br5)**

This feature configures the PCI-E Bifurcation setting for a PCI-E port specified by the user. The options are x16 and **Auto**.

### **►CPU1 PCI-E Br0D00F0 - Port 0/DMI (Available for CPU 1 Configuration only)**

#### **Link Speed**

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

The following information will also be displayed:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

#### **PCI-E Port Max (Maximum) Payload Size (Available for CPU 1 Configuration only)**

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

### **►IOAT Configuration**

#### **Disable TPH (TLP Processing Hint)**

TPH is used for data-tagging with a destination ID and a few important attributes. It can send critical data to a particular cache without writing through to memory. Select No in this item for TLP Processing Hint support, which will allow a "TPL request" to provide "hints" to help optimize the processing of each transaction occurred in the target memory space. The options are Yes and **No**.

#### **Prioritize TPH (TLP Processing Hint)**

Select Yes to prioritize the TPL requests that will allow the "hints" to be sent to help facilitate and optimize the processing of certain transactions in the system memory. The options are **Enable** and **Disable**.

#### **Relaxed Ordering**

Select Enable to allow certain transactions to be processed and completed before other transactions that have already been enqueued. 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 Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to the VMM (Virtual Machine Monitor) through the DMAR ACPI tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data-sharing. The options are **Enable** and **Disable**.

### ACS Control

Use this feature to program Access Control Services (ACS) to the PCI-E Root Port Bridges. The options are **Enable** and **Disable**.

### Interrupt Remapping

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

### PassThrough DMA

Select Enable for the Non-Iscoh VT-d engine to pass through DMA (Direct Memory Access) to enhance system performance. The options are **Enable** and **Disable**.

### ATS

Select Enable to enable ATS (Address Translation Services) support for the Non-Iscoh VT-d engine to enhance system performance. The options are **Enable** and **Disable**.

### Posted Interrupt

Select Enable to support VT\_D Posted Interrupt which will allow external interrupts to be sent directly from a direct-assigned device to a client machine in non-root mode to improve virtualization efficiency by simplifying interrupt migration and lessening the need of physical interrupts. The options are **Enable** and **Disable**.

### Coherency Support (Non-Iscoh)

Select Enable for the Non-Iscoh VT-d engine to pass through DMA (Direct Memory Access) to enhance system performance. The options are **Enable** and **Disable**.

## ►Intel® VMD Technology

### ►Intel® VMD for Volume Management Device on CPU1/CPU2

#### VMD Config for PStack0

##### Intel® VMD for Volume Management Device

Select Enable to use the Intel Volume Management Device Technology for this stack. The options are **Disable** and **Enable**.

***\*If the item "Intel VMD for Volume Management Device" above is set to Enable, the following items will be displayed:***

**VMD port 1A~VMD port 1D (Available when the device is detected by the system)**

Select Enable to use the Intel Volume Management Device Technology for this specific root port. The options are **Disable** and **Enable**.

**Hot Plug Capable (Available when the device is detected by the system)**

Use this feature to enable hot plug support for PCI-E root ports 1A~1D. The options are **Disable** and **Enable**.

**VMD Config for PStack1**

**Intel® VMD for Volume Management Device**

Select Enable to use the Intel Volume Management Device Technology for this stack. The options are **Disable** and **Enable**.

***\*If the item "Intel VMD for Volume Management Device" above is set to Enable, the following items will be displayed:***

**VMD port 2A~VMD port 2D (Available when the device is detected by the system)**

Select Enable to use the Intel Volume Management Device Technology for this specific root port. The options are **Disable** and **Enable**.

**Hot Plug Capable (Available when the device is detected by the system)**

Use this feature to enable hot plug support for PCI-E root ports 2A~2D. The options are **Disable** and **Enable**.

**VMD Config for PStack2**

**Intel® VMD for Volume Management Device**

Select Enable to use the Intel Volume Management Device Technology for this stack. The options are **Disable** and **Enable**.

***\*If the item "Intel VMD for Volume Management Device" above is set to Enable, the following items will be displayed:***

**VMD port 3A~VMD port 3D (Available when the device is detected by the system)**

Select Enable to use the Intel Volume Management Device Technology for this specific root port. The options are **Disable** and **Enable**.

**Hot Plug Capable (Available when the device is detected by the system)**

Use this feature to enable hot plug support for PCI-E root ports 3A~3D. The options are **Disable** and **Enable**.

## ►Intel® VMD for Volume Management Device on CPU2

### VMD Config for PStack0

#### Intel® VMD for Volume Management Device

Select Enable to use the Intel Volume Management Device Technology for this stack. The options are **Disable** and Enable.

*\*If the item "Intel VMD for Volume Management Device" above is set to Enable, the following items will be displayed:*

#### VMD port 1A~VMD port 1D (Available when the device is detected by the system)

Select Enable to use the Intel Volume Management Device Technology for this specific root port. The options are **Disable** and Enable.

#### Hot Plug Capable (Available when the device is detected by the system)

Use this feature to enable hot plug support for PCI-E root ports 1A~1D. The options are **Disable** and Enable.

### VMD Config for PStack1

#### Intel® VMD for Volume Management Device

Select Enable to use the Intel Volume Management Device Technology for this stack. The options are **Disable** and Enable.

*\*If the item "Intel VMD for Volume Management Device" above is set to Enable, the following items will be displayed:*

#### VMD port 2A~VMD port 2D (Available when the device is detected by the system)

Select Enable to use the Intel Volume Management Device Technology for this specific root port. The options are **Disable** and Enable.

#### Hot Plug Capable (Available when the device is detected by the system)

Use this feature to enable hot plug support for PCI-E root ports 2A~2D. The options are **Disable** and Enable.

### VMD Config for PStack2

#### Intel® VMD for Volume Management Device

Select Enable to use the Intel Volume Management Device Technology for this stack. The options are **Disable** and Enable.

*\*If the item "Intel VMD for Volume Management Device" above is set to Enable, the following items will be displayed:*

#### VMD port 3A~VMD port 3D (Available when the device is detected by the system)

Select Enable to use the Intel Volume Management Device Technology for this specific root port. The options are **Disable** and Enable.

### **Hot Plug Capable (Available when the device is detected by the system)**

Use this feature to enable hot plug support for PCI-E root ports 3A~3D. The options are **Disable** and **Enable**.

### **II0-PCI-E Express Global Options**

#### **PCI-E Completion Timeout Disable**

Use this feature to enable PCI-E Completion Timeout support for electric tuning. The options are **Yes**, **No**, and **Per-Port**.

## **►South Bridge**

The following South Bridge information will display:

- USB Module Version
- USB Devices

### **Legacy USB Support**

Select Enabled to support onboard legacy USB devices. Select Auto to disable legacy support if there are no legacy USB devices present. Select Disable 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 options are **Enabled** and **Disabled**.

### **Port 60/64 Emulation**

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

### **PCI-E PLL SSC**

Select Enable for PCH PCI-E Spread Spectrum Clocking support, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Enable** and **Disable**.

## ►Server ME (Management Engine) Configuration

This feature displays the following system ME configuration settings.

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

## ►PCH SATA Configuration

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

### **SATA Controller**

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

#### **Configure SATA as (Available when the item above: SATA Controller is enabled)**

Select AHCI to configure a SATA drive specified by the user as an AHCI drive. Select RAID to configure a SATA drive specified by the user as a RAID drive. The options are **AHCI** and **RAID**. (**Note:** This item is hidden when the SATA Controller item is set to **Disabled**.)

### **SATA HDD Unlock**

Select **Enable** to unlock SATA HDD password in the OS. The options are **Enable** and **Disable**.

### **Aggressive Link Power Management**

When this item is set to **Enabled**, the SATA AHCI controller manages the power use of the SATA link. The controller will put the link in a low power mode during an extended period of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are **Enable** and **Disable**.

#### **SATA RAID Option ROM/UEFI Driver (Available when the item "Configure SATA as" is set to "RAID")**

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

## (I-)SATA Port 0 - SATA Port 7

### Hot Plug

Select Enable to support Hot-plugging for the device installed on a selected SATA port which will allow the user to replace the device installed in the slot without shutting down the system. The options are **Enable** and **Disable**.

### Spin Up Device

On an edge detect from 0 to 1, set this item to allow the SATA device installed on the SATA port specified by the user to start a COMRESET initialization. The options are **Enable** and **Disable**.

### SATA Device Type

Use this item to specify if the device installed on the SATA port selected 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**.

## ►PCH sSATA Configuration

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

### sSATA Controller

This item enables or disables the onboard sSATA controller supported by the Intel PCH. The options are **Enable** and **Disable**.

### Configure sSATA as

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 **AHCI** and **RAID**. (**Note:** This item is hidden when the sSATA Controller item is set to **Disabled**.)

### SATA HDD Unlock

Select Enable to unlock sSATA HDD password in the OS. The options are **Enable** and **Disable**.

### Aggressive Link Power Management

When this item is set to **Enable**, the sSATA AHCI controller manages the power use of the SATA link. The controller will put the link in a low power mode during an extended period of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are **Disable** and **Enable**.

### sSATA RAID Option ROM/UEFI Driver (Available when the item "Configure SATA as" is set to "RAID")

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

## sSATA Port 0 - sSATA Port 5

### Hot Plug

Select Enable to support Hot-plugging for the device installed on an sSATA port selected by the user which will allow the user to replace the device installed in the slot without shutting down the system. The options are **Disable** and Enabled.

### Spin Up Device

On an edge detect from 0 to 1, set this item to allow the sSATA device installed on the sSATA port specified by the user to start a COMRESET initialization. The options are Enable and **Disable**.

### sSATA Device Type

Use this item to specify if the device installed on 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.

## ►PCIe/PCI/PnP Configuration

The following PCI information will be displayed:

- PCI Bus Driver Version
- PCI Devices Common Settings

### 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 Support (Available if the system supports Single-Root Virtualization)

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

### MMIO High Base

Use this feature to select the base memory size according to memory-address mapping for the IO hub. The base memory size must be between 4032G to 4078G. The options are **56T**, 40T, 24T, 16T, 4T, and 1T.

### MMIO High Granularity Size

Use this feature to select the high memory size according to memory-address mapping for the IO hub. The options are 1G, 4G, 16G, 64G, **256G**, and 1024G.

### 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.

### **MMCFG Base**

This feature determines the lowest MMCFG (Memory-Mapped Configuration) base assigned to PCI devices. The options are 1G, 1.5G, 1.75G, **2G**, 2.25G, and 3G.

### **NVMe Firmware Source**

This feature determines which type of the NVMe firmware should be used in your system. The options are **Vendor Defined Firmware** and AMI Native Support.

### **VGA Priority**

This feature selects the graphics device to be used as the primary video display for system boot. The options are Auto, **Onboard** and Offboard.

### **PCH M.2 Slot/RSC-X-66-C Slot1/RSC-X-66-C Slot2/SIOM: CPU2 PCI-E 3.0/SIOM: CPU2 PCI-E 3.0 #2**

Select EFI to allow the user to boot the computer using an EFI (Expansible Firmware Interface) device installed on the PCI-E slot specified by the user. Select Legacy to allow the user to boot the computer using a legacy device installed on the PCI-E slot specified by the user. The options are Disabled, **Legacy** and EFI. (Note: Riser card names may differ in each system.)

### **Bus Master Enable**

Select Enabled to enable the Bus Driver Master bit. The options are Disabled and **Enabled**.

### **Onboard LAN Device**

Select Enable to use onboard LAN devices for internet connections. The options are Disabled and **Enable**.

### **Onboard LAN1 Option ROM**

Use this feature to select the type of device to be installed in LAN Port1 for system boot. The options are **Legacy**, EFI, and Disabled.

### **Onboard LAN2 Option ROM/Onboard LAN3 Option ROM/Onboard LAN4 Option ROM**

Use this feature to select the type of device to be installed in LAN Port2/ LAN Port3/LAN Port4 for system boot. The options are Legacy, EFI, and **Disabled**.

### **Onboard Video Option ROM**

Use this feature to select the Onboard Video Option ROM type. The options are Disabled, **Legacy** and EFI.

## ►Network Stack Configuration

### 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**.

*\*If "Network Stack" is set to **Enabled**, the following items will display:*

#### Ipv4 PXE Support

Select Enabled to enable Ipv4 PXE boot support. If this feature is disabled, it will not create the Ipv4 PXE boot option. The options are **Disabled** and **Enabled**.

#### Ipv4 HTTP Support

Select Enabled to enable Ipv4 HTTP boot support. If this feature is disabled, it will not create the Ipv4 HTTP boot option. The options are **Enabled** and **Disabled**.

#### Ipv6 PXE Support

Select Enabled to enable Ipv6 PXE boot support. If this feature is disabled, it will not create the Ipv6 PXE boot option. The options are **Disabled** and **Enabled**.

#### Ipv6 HTTP Support

Select Enabled to enable Ipv6 HTTP boot support. If this feature is disabled, it will not create the Ipv6 HTTP boot option. The options are **Enabled** and **Disabled**.

### PXE Boot Wait Time

Use this feature to select the wait time to press the <ESC> key to abort the PXE boot. The default is **0**.

### Media Detect Time

Use this feature to select the wait time in seconds for the BIOS ROM to detect the LAN media (Internet connection or LAN port). The default is **1**.

## ►Super IO Configuration

### Super IO Chip AST2500

## ►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 feature displays the base I/O port address and the Interrupt Request address of a serial port specified by the user.

**Note:** This item is hidden when Serial Port 1 is set to Disabled.

### **Change 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 2 Configuration**

### **Serial Port 2**

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

### **Device Settings**

This feature displays the base I/O port address and the Interrupt Request address of a serial port specified by the user.

**Note:** This item is hidden when Serial Port 1 is set to Disabled.

### **Change Settings**

This feature specifies the base I/O port address and the Interrupt Request address of Serial Port 2. 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 2 are **Auto**, (IO=2F8h; IRQ=3), (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 2 Attribute**

Select SOL to use COM Port 2 as a Serial\_Over\_LAN (SOL) port for console redirection. The options are **COM** and **SOL**.

## **►Serial Port Console Redirection**

### **COM 1 Console Redirection**

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

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

### ►Console Redirection Settings (when COM1 Console Redirection is Enabled)

#### 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 buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

#### VT-UTF8 Combo Key Support

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

### **Recorder Mode**

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

### **Resolution 100x31**

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

### **Legacy OS Redirection Resolution**

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

### **Putty KeyPad**

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

### **Redirection After BIOS Post**

Use this feature to enable or disable legacy Console Redirection after BIOS POST. When the option - Bootloader is selected, legacy Console Redirection is disabled before booting the OS. When the option-Always Enable is selected, legacy Console Redirection remains enabled upon OS bootup. The options are **Always Enable** and Bootloader.

## **SOL (Serial-Over-LAN)**

### **Console Redirection (for SOL/COM2)**

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:***

### **►Console Redirection Settings (for SOL/COM2)**

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 buffer overflow. 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**, **XTERM**, **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**.

## ►Legacy Console Redirection Settings

### Legacy Console Redirection Settings

Use the feature to select the COM port to display redirection of Legacy OS and Legacy OPROM messages. The options are **COM1** and **SOL**.

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

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

#### Console Redirection (for EMS)

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

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

## ►(EMS) Console Redirection Settings

### 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 feature 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 feature 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 setting for each these features is displayed:

### Data Bits, Parity, Stop Bits

## ►ACPI Settings

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

### NUMA Support (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.

### 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.

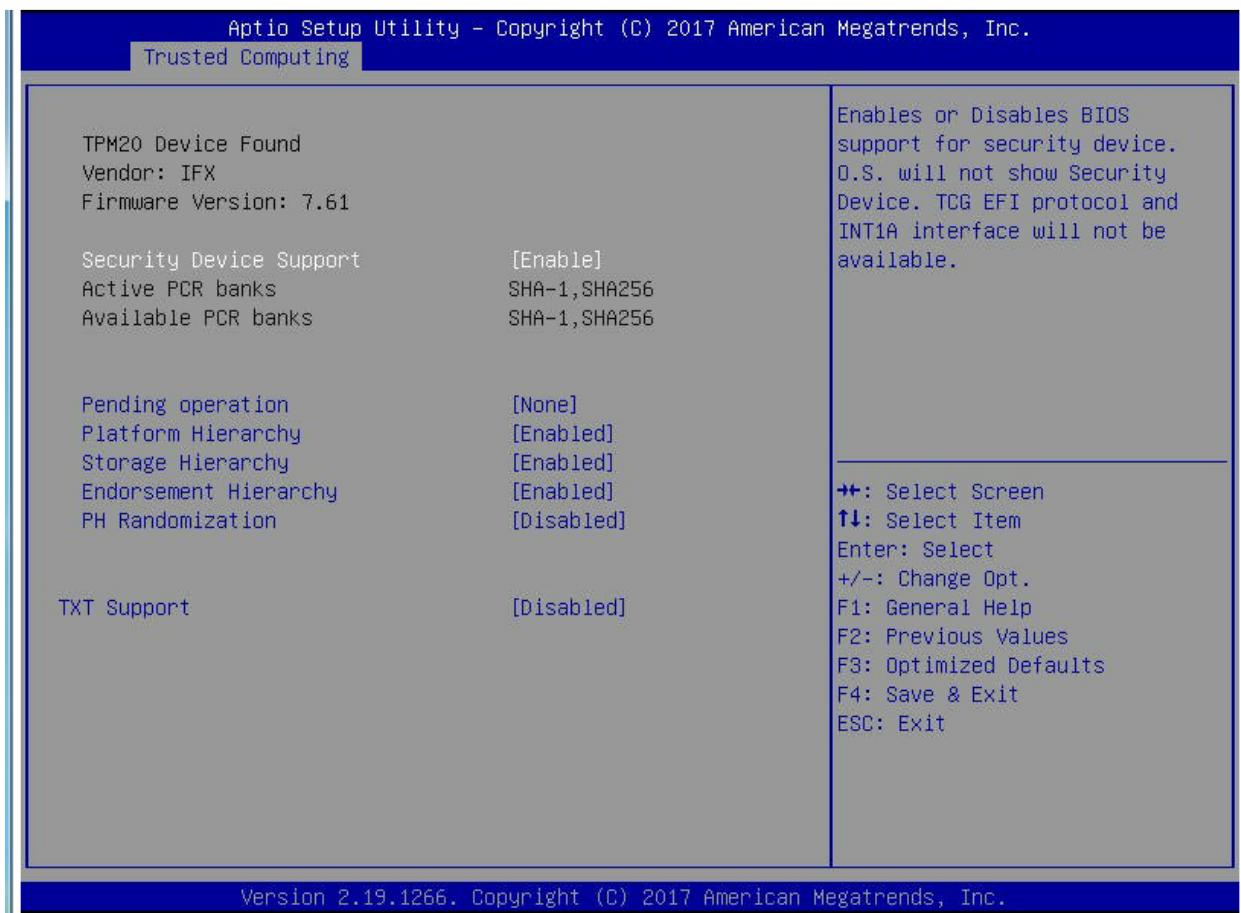
### High Precision Timer

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.

## ►Trusted Computing (Available when a TPM device is detected and PTT Support under "Server ME Config" is not Enabled)

When a TPM (Trusted-Platform Module) device is detected in your machine, the following information will display.

- TPM2.0 Device Found
- Vendor
- Firmware Version



### Security Device Support

If this feature and the TPM jumper (JPT1), if available, are both enabled, the onboard security (TPM) device will be enabled in the BIOS to enhance data integrity and system security. Please note that the OS will not show the security device. Neither TCG EFI protocol nor INT1A interaction will be available for use. If you have made changes on the setting on this item, be sure to reboot the system for the change to take effect. The options are **Disable** and **Enable**. If this option is set to **Enable**, the following screen and items will display:

- Active PCR Banks
- Available PCR Banks

## Pending Operation

Use this feature to schedule a TPM-related operation to be performed by a security (TPM) device at the next system boot to enhance system data integrity. Your system will reboot to carry out a pending TPM operation. The options are **None** and TPM Clear.

**Note:** Your system will reboot to carry out a pending TPM operation.

## Platform Hierarchy (for TPM Version 2.0 and above)

Select Enabled for TPM Platform Hierarchy support which will allow the manufacturer to utilize the cryptographic algorithm to define a constant key or a fixed set of keys to be used for initial system boot. This early boot code is shipped with the platform and is included in the list of "public keys". During system boot, the platform firmware uses this trusted public key to verify a digital signature in an attempt to manage and control the security of the platform firmware used in a host system via a TPM device. The options are **Enabled** and **Disabled**.

## Storage Hierarchy

Select Enabled for TPM Storage Hierarchy support that is intended to be used for non-privacy-sensitive operations by the platform owner such as an IT professional or the end user. Storage Hierarchy has an owner policy and an authorization value, both of which can be set and are held constant (-rarely changed) through reboots. This hierarchy can be cleared or changed independently of the other hierarchies. The options are **Enabled** and **Disabled**.

## Endorsement Hierarchy

Select Enabled for Endorsement Hierarchy support, which contains separate controls to address the user's privacy concerns because the primary keys in this hierarchy are certified by the TPM or a manufacturer to be constrained to an authentic TPM device that is attached to an authentic platform. A primary key can be an encrypted, and a certificate can be created using TPM2\_ActivateCredential. It allows the user to independently enable "flag, policy, and authorization value" without involving other hierarchies. A user with privacy concerns can disable the endorsement hierarchy while still using the storage hierarchy for TPM applications and permitting the platform software to use the TPM. The options are **Enabled** and **Disabled**.

## PH (Platform Hierarchy) Randomization (for TPM Version 2.0 and above)

Select Enabled for Platform Hierarchy Randomization support, which is used only during the platform developmental stage. This feature cannot be enabled in the production platforms. The options are **Disabled** and **Enabled**.

## TXT Support

Select Enabled to enable Intel Trusted Execution Technology (TXT) support to enhance system security and data integrity. The options are **Disabled** and **Enabled**.

**Note 1:** 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).

**Note 2:** For more information on TPM, please refer to the TPM manual at <http://www.supermicro.com/manuals/other>.

## ►iSCSI Configuration

### **iSCSI Initiator Name**

This feature allows the user to enter the unique name of the iSCSI Initiator in IQN format. Once the name of the iSCSI Initiator is entered into the system, configure the proper settings for the following items.

►Add an Attempt

►Delete Attempts

►Change Attempt Order

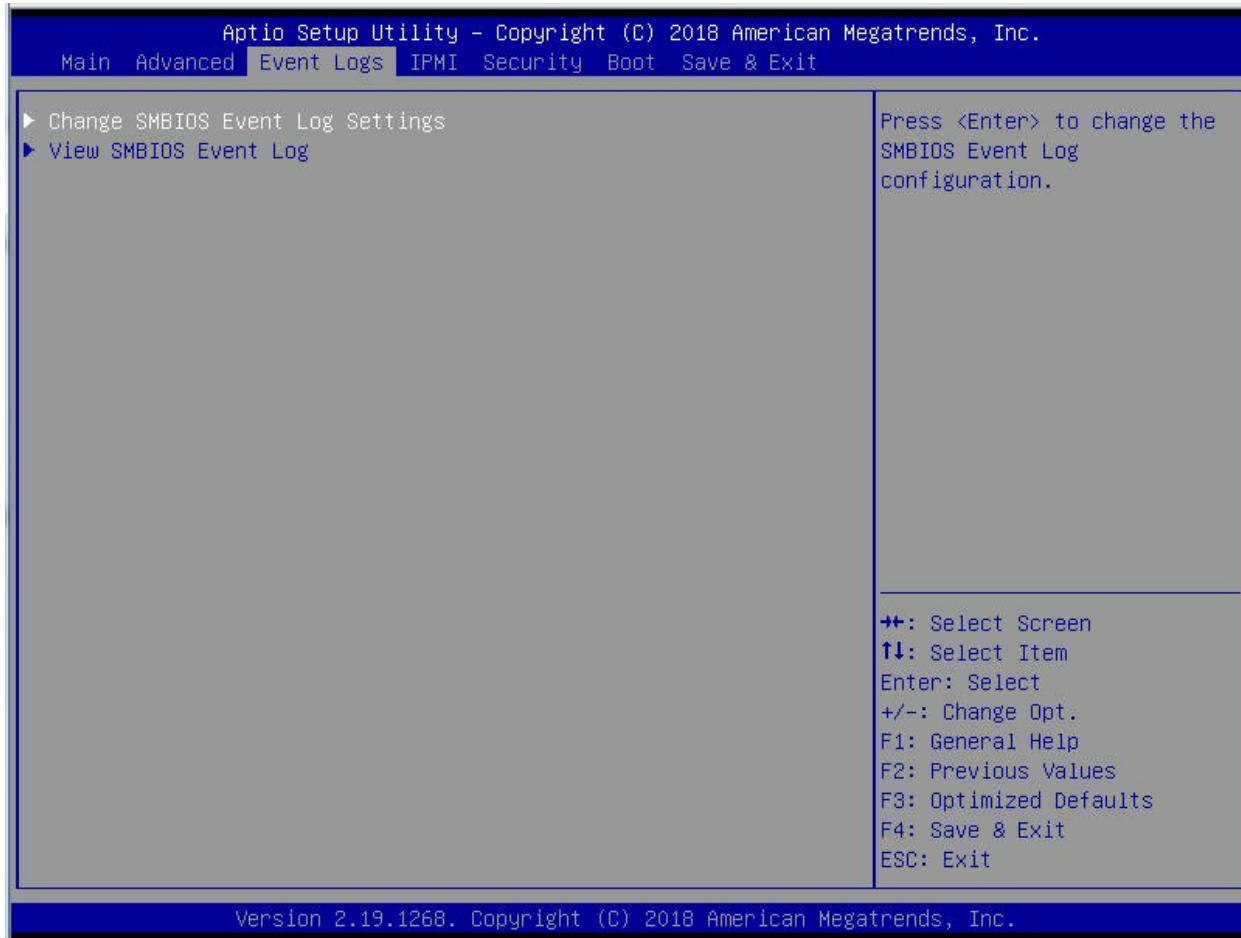
## ►Intel® Virtual RAID on CPU

When this submenu is selected and the RAID devices are detected, the BIOS screen displays the following items:

Intel® VROC with VMD Technology 5.3.0.1052

## 6.4 Event Logs

Use this feature to configure Event Log settings.



### ►Change SMBIOS Event Log 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**.

#### Erasing Settings

##### Erase Event Log

Select Enabled 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, Next 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 Enabled and **Disabled**.

### **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)**

Use this feature to specify 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**.

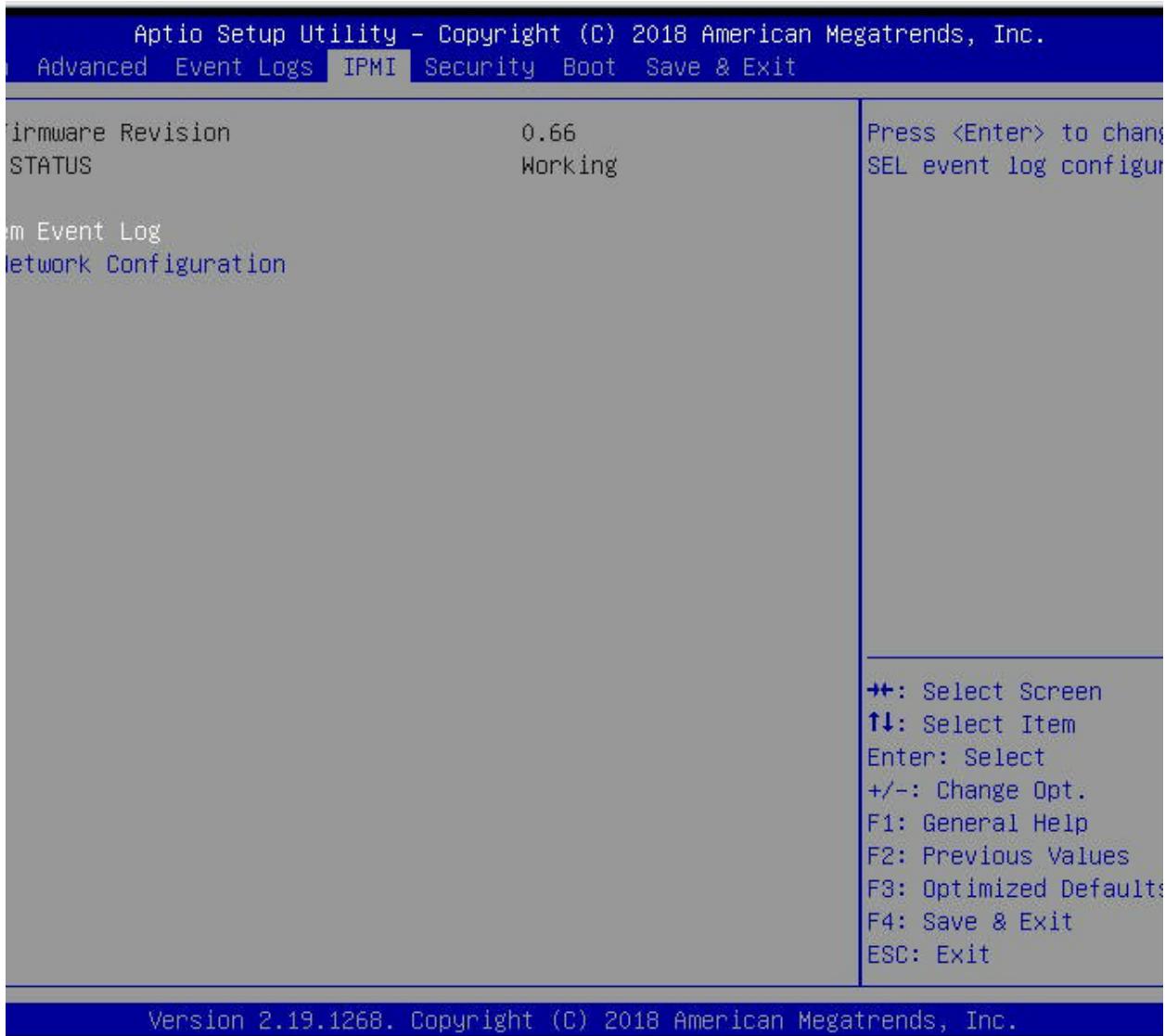
**Note:** Please reboot the system for the changes to take effect.

### **►View SMBIOS Event Log**

This item allows the user to view the event in the system event log. Select this feature and press **<Enter>** to view the status of an event in the log. The following categories are displayed:  
**Date/Time/Error Code/Severity**

## 6.5 IPMI

Use this feature to configure Intelligent Platform Management Interface (IPMI) settings.



When you select this submenu and press the <Enter> key, the following information will display:

- BMC Firmware Revision: This feature indicates the firmware revision of the BMC (Baseboard Management Controller) used in your system.
- IPMI Status: This feature indicates IPMI status of your system.

### ►System Event Log

#### Enabling/Disabling Options

#### SEL Components

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

## Erasing Settings

### Erase SEL

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

### When SEL is Full

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

### Update IPMI LAN Configuration

Select Yes for the BIOS to update the following LAN settings upon the next system boot. The options are **No** and Yes.

## ►BMC Network Configuration

### Update IPMI LAN Configuration

Select Yes for the BIOS to implement all IP/MAC address changes at the next system boot. The options are **No** and Yes. The following items will be displayed:

- IPMI LAN Selection: This feature displays the IPMI LAN setting. The default setting is **Failover**.
- IPMI Network Link Status: This item displays the IPMI Network Link status. The default setting is **Dedicated LAN**.
- Current Configuration Address Source: This feature displays the source of the current IPMI LAN address. The default setting is **DHCP (Dynamic Host Configuration Protocol)**.
- Station IP Address: This feature 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 feature displays the sub-network that this computer belongs to. The value of each three-digit number separated by dots should not exceed 255.
- Station MAC Address: This feature displays the Station MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.
- Gateway IP Address: This feature 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 IPMI VLAN support. The options are Enabled and Disabled.

***\*If the item "Update IPMI LAN Configuration" is set to Yes, the following items will display:***

#### **IPMI LAN Selection**

Use this feature to select the type of the IPMI LAN. The options are Dedicated, Shared, and **Failover**.

#### **Configuration Address Source**

Use this feature 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. When the option: Static is selected, the following features will be displayed:

- Station IP Address
- Subnet Mask
- Station MAC Address
- Gateway IP Address

#### **VLAN**

Select Enabled for IPMI VLAN support. The options are **Disabled** and Enabled.

#### **IPV6 Support**

Select Enabled for IPV6 support. The options are **Enabled** and Disabled.

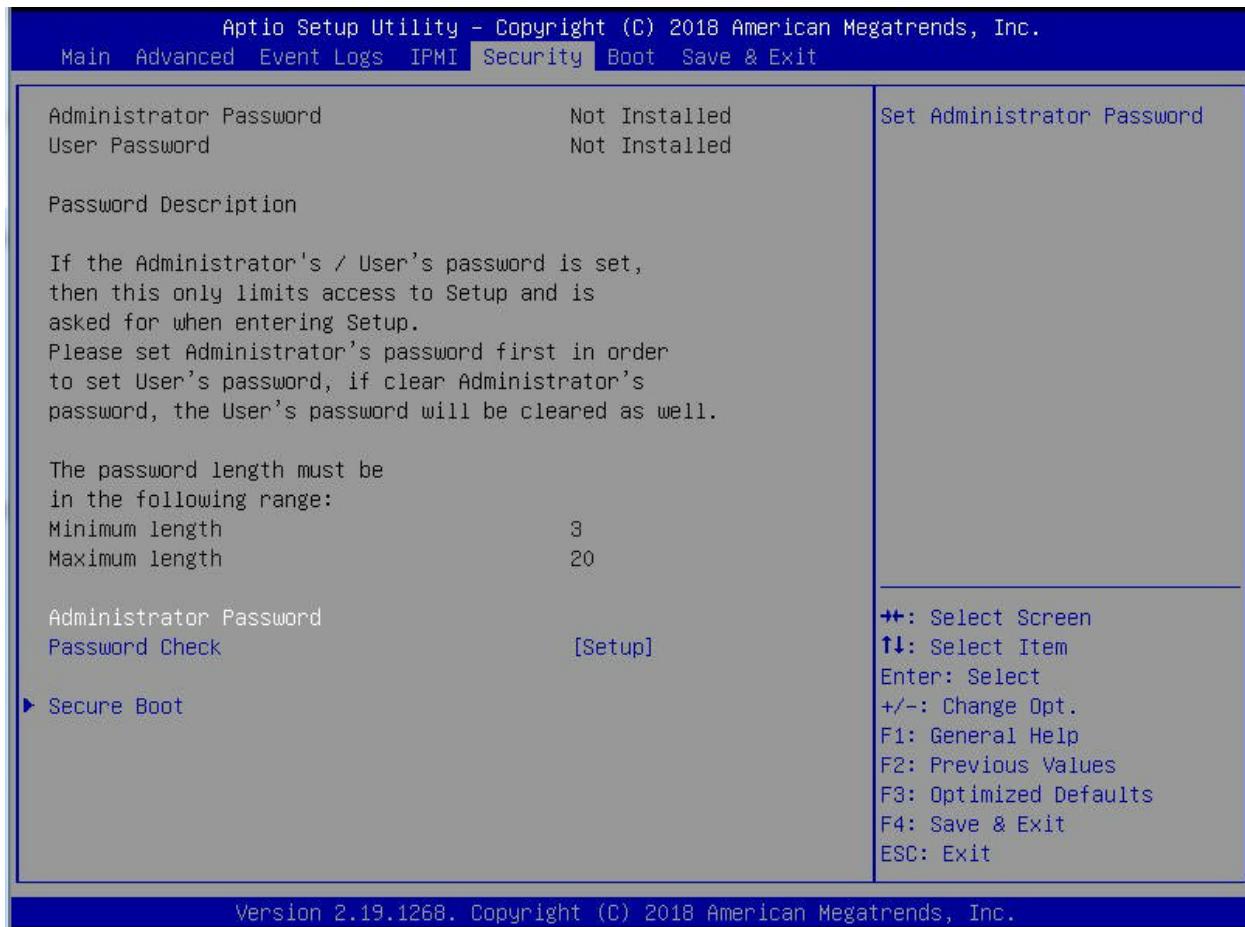
#### **Configuration Address Source**

Use this feature 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. When the option: Static is selected, the following features will be displayed:

- Station IP Address
- Subnet Mask
- Station MAC Address
- Gateway IP Address

## 6.6 Security Settings

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



### Administrator Password

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

### User Password

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.

### Password Check

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

## ►Secure Boot

When you select this submenu and press the <Enter> key, the following items will display:

- System Mode
- Secure Boot

### Secure Boot

If this feature is set to Enabled, Secure Boot will be activated when a Platform Key (PK) is entered. A Platform Key is a security key used to manage the security settings of the platform firmware used in your system. The options are Enabled and **Disabled**.

#### Secure Boot Mode

Use this feature to select the desired secure boot mode for the system. The options are Standard and **Custom**.

#### CSM Support

Select Enabled to enable Compatibility Service Module (CMS) which will support Legacy BIOS through UEFI to enhance system performance. The options are **Enabled** and **Disabled**.

## ►Key Management

### Provision Factory Default Keys

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

## ►Enroll All Factor Default Keys

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

## ►Enroll EFI Image

Select this item and press <Enter> to select an EFI (Extensible Firmware Interface) image for the system to operate in Secure Boot mode.

## ►Save All Secure Boot Variables

This feature allows the user to set and save the secure boot key variables specified by the user.

## ►Platform Key (PK)

This feature allows the user to enter and configure a set of values to be used as a platform firmware key for the system. This set of values also indicate the size, the keys numbers, and the key source of the Platform Key. The options are **Save to File**, Set New, and Erase.

## ►Key Exchange Keys

This feature allows the user to enter and configure a set of values to be used as a Key-Exchange-Keys for the system. This set of values also indicate the size, the keys numbers, and the key source of the Key-Exchange-Keys. The options are **Save to File**, Set New, and Erase.

## ►Authorized Signatures

This feature allows the user to enter and configure a set of values to be used as Authorized Signatures for the system. These values also indicate the size, the keys numbers, and the key source of the Authorized Signatures. The options are **Set New** and Append.

**Secure Boot Variable/Size/Key#/Key Sources** The options are **Save to File**, Set New, and Erase.

## ►Forbidden Signatures

This feature allows the user to enter and configure a set of values to be used as Forbidden Signatures for the system. These values also indicate the size, the keys numbers, and the key source of the Forbidden Signatures. The options are **Save to File**, Set New, and Erase.

## ►Authorized TimeStamps

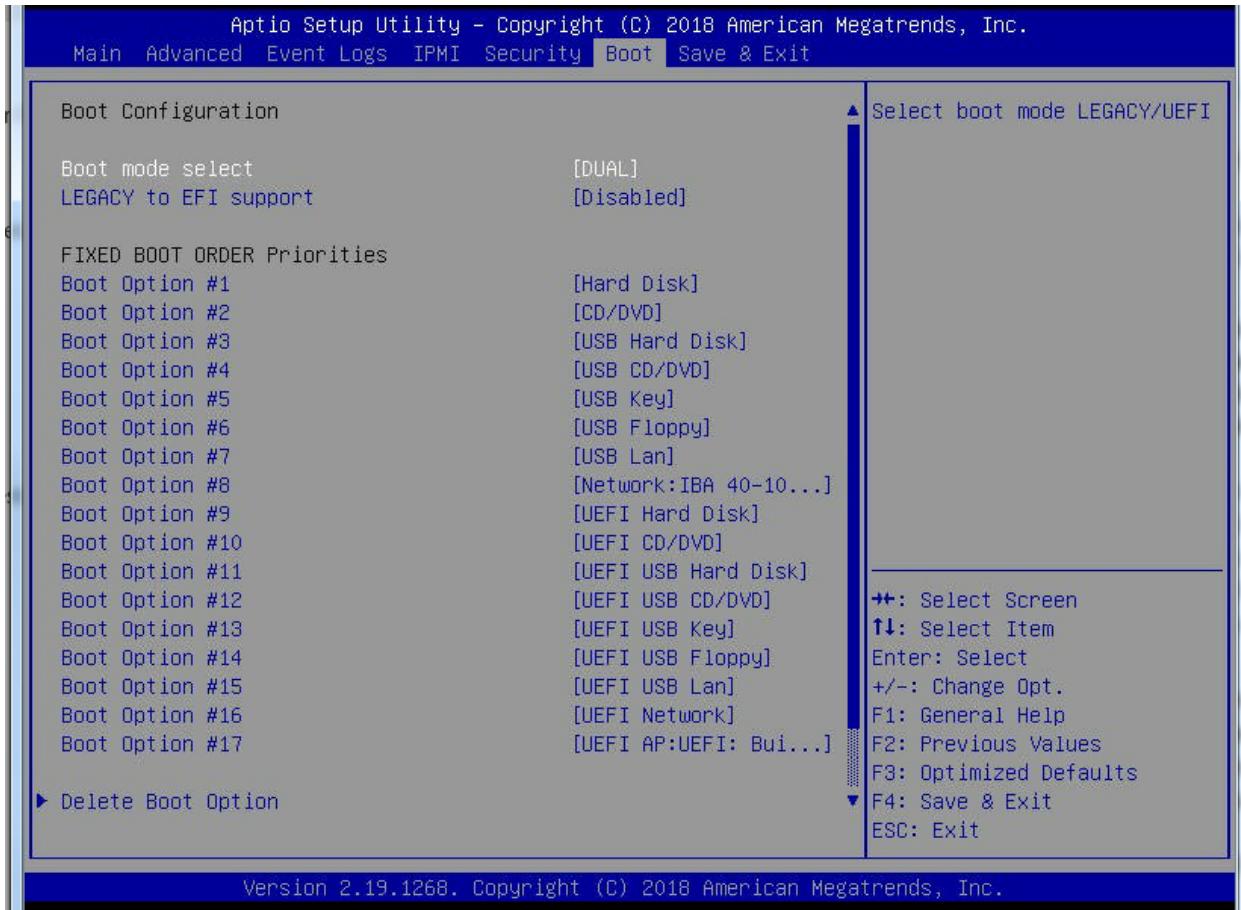
This feature allows the user to set and save the timestamps for Authorized Signatures to indicate when these signatures were entered into the system. The options are **Save to File**, Set New, and Erase.

## ►OsRecovery Signatures

This feature allows the user to set and save the Authorized Signatures used for OS recovery. The options are **Save to File**, Set New, and Erase.

## 6.7 Boot Settings

Use this feature to configure Boot Settings:



### Boot Mode Select

Use this feature to select the type of devices to be used for system boot. The options are Legacy, UEFI (Unified Extensible Firmware Interface), and Dual.

### Legacy to EFI Support

Select Enabled for the system to boot from an EFI OS when the Legacy OS fails. The options are Enabled and Disabled.

### Fixed Boot Order Priorities

This feature prioritizes the order of a bootable device 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 #17

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

- Boot Option #1 - Boot Option #8

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

- Boot Option #1 - Boot Option #9

## **Add New Boot Option**

This feature allows the user to add a new boot option to the boot priority features for your system.

### **Add Boot Option**

Use this feature to specify the name for the new boot option.

### **Path for Boot Option**

Use this feature to enter the path for the new boot option in the format fsx:\path\filename.efi.

### **Boot Option File Path**

Use this feature to specify the file path for the new boot option.

### **Create**

After the name and the file path for the boot option are set, press <Enter> to create the new boot option in the boot priority list.

## **►Add New Driver Option**

Use this feature to select a new driver to add to the boot priority list.

### **Add Driver Option**

Use this feature to specify the name of the driver that the new boot option is added to.

### **Path for Driver Option**

Use this feature to specify the path to the driver that the new boot option is added to.

### **Driver Option File Path**

Use this feature to specify the file path of the driver that the new boot option is added to.

### **Create**

After the driver option name and the file path are set, press <Enter> to enter to submenu and click OK to create the new boot option drive.

## ►Delete Boot Option

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

### **Delete Boot Option**

Use this feature to remove an EFI boot option from the boot priority list.

## ►Delete Driver Option

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

### **Delete Drive Option**

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

## ►Hard Disk Drive BBS Priorities

- Boot Option #1 - #5

## ►Network Drive BBS Priorities

- Boot Option #1

## ►USB Key Drive BBS Priorities

- Boot Option #1

## ►UEFI Hard Disk Drive BBS Priorities

- Boot Option #1

## ►UEFI USB Key Drive BBS Priorities

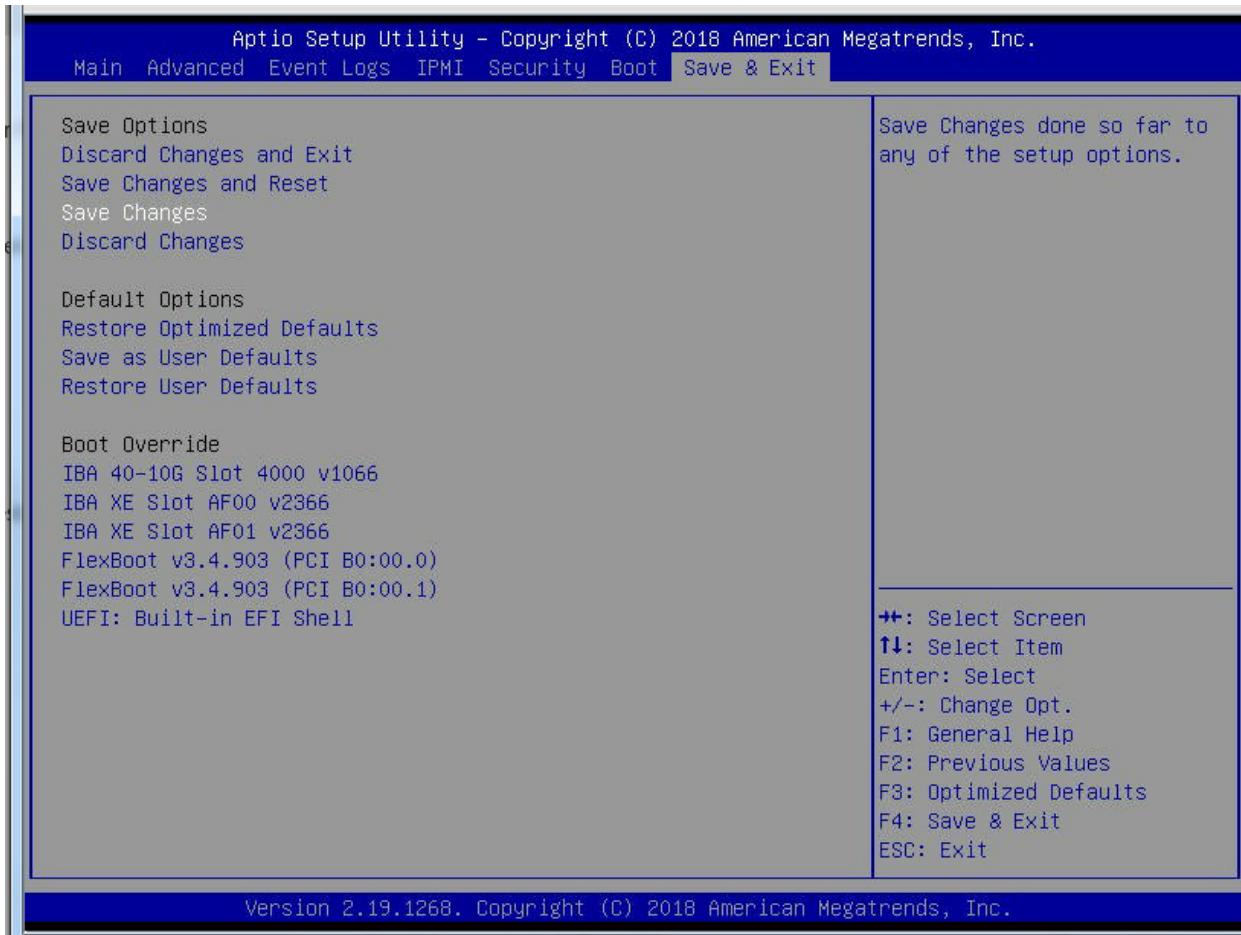
- Boot Option #1

## ►UEFI Application Boot Priorities

- Boot Option #1

## 6.8 Save & Exit

Select the Save & Exit tab from the BIOS setup screen to configure the settings below.



### Save Options

#### Discard Changes and Exit

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

#### Save Changes and Reset

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

#### Save Changes

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

## **Discard Changes**

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

## **Default Options**

### **Restore Optimized Defaults**

To set this feature, select Restore Defaults from the Exit menu and press <Enter> to load manufacturer default settings which are intended for maximum system performance but not for maximum stability.

### **Save As User Defaults**

To set this feature, select Save as User Defaults from the Exit menu and press <Enter>. This enables the user to save any changes to the BIOS setup for future use.

### **Restore User Defaults**

To set this feature, select Restore User Defaults from the Exit menu and press <Enter>. Use this feature to retrieve user-defined settings that were saved previously.

### **Boot Override**

This feature allows the user to override the Boot priorities sequence in the Boot menu, and immediately boot the system with a device specified by the user instead of the one specified in the boot list. This is a one-time override.

## Appendix A

### BIOS Error Codes

#### A.1 BIOS Error Beep (POST) Codes

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

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

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

These fatal errors are usually communicated through a series of audible beeps.

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

## A.2 Additional BIOS POST Codes

The AMI BIOS supplies additional checkpoint codes, which are documented online at <http://www.supermicro.com/support/manuals/> ("AMI BIOS POST Codes User's Guide").

When BIOS performs the Power On Self Test, it writes checkpoint codes to I/O port 0080h. If the computer cannot complete the boot process, a diagnostic card can be attached to the computer to read I/O port 0080h (Supermicro p/n AOC-LPC80-20).

For information on AMI updates, please refer to <http://www.ami.com/products/>.

## Appendix B

# Standardized Warning Statements for AC Systems

## B.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 website at [http://www.supermicro.com/about/policies/safety\\_information.cfm](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 von 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 התקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בעיה כלשהי, יש ליצור קשר עם מחלקת תמייה טכנית של סופרמיקרו. טכנים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים. יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במאזן סופרמיקרו.

اًكَّ فَحَالَةٌ وُكِيَّ أَيْ تَتَسَبَّبُ فِي اصَابَةٍ جَسْدَهُ هَذَا الزَّهْزَعُ خَطَرٌ تَحْذِيرٌ .  
 قَبْلَ أَيْ تَعْوِلُ عَلَى أَيْ هَعْدَاتٍ، كَيْ عَلَى عَلَنِ الْوَخَاطِرِ الْأَجْوَهُ عَيْ الْذَوَائِزِ  
 الْكَهْزَبَائِيَّةِ  
 وَكَيْ عَلَى دَرَّهُ بِالْوَوَارِسَاتِ الْقَائِيَّةِ لَوْعُ وَقَعَ أَيْ حَادَثٌ  
 اسْتَخْدِمْ رَقْنَ الْبِّإِيِّ الْوَصْصَفَهَّا كَلْ تَحْذِيرٌ لِلْعَشْرِ تَزْجُوتَهَا

### 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 waarschuwingssymbool 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 התקינה 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.

מווצר זה מסתמך על הגנה המותקנת במבנים **למניעת קצר חשמל**. יש לוודא כי המכשיר המגן מפני הקצר החשמלי הוא לא יותר מ- 250VDC, 20A

هذا المنتج يعتمد على معدات الحماية من الدوائر القصيرة التي تم تثبيتها في المبني  
تأكد من أن تقييم الجهاز الوقائي ليس أكثر من : 20A, 250V

### 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 apparaat niet groter gedimensioneerd is dan 250V, 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 châssis pour installer ou enlever des composants de système.

ازהרה מפני ניתוק חשמלי,

ازהרה!

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

يجب فصل انظاوا من جميع مصادر انطاقت وإزانت سهك انكهرباء من وحدة امداد  
انطاقت قبم

انصل إني انمناطق انداخهيت نههيكم نتشبيج أو إزانت مكناث الجهاز

경고!

시스템에 부품들을 장착하거나 제거하기 위해서는 새시 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 לחת שירות עבור הציוד.

والمدربين لتزكيب واستبدال أو خدمة هذا الجهاز يجب أن يسمح فقط للموظفه المؤهلية

**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  
ゾーンに制限されたアクセスがあります

יש להתקן את היחידה באזוריים שיש בהם הגבלת גישה. הגישה ניתנת באמצעות  
'כלי אבטחה בלבד (מפתח, מנעול ועוד).

تحصيص هذه единة ترك بها في مناطق ممنوعة .  
يمكن التنصيب في مناطق ممنوعة فقط من خلال استخدام أدوات خاصة  
أو أوس هُت أخري نلاًاما قم و مفتاح

#### 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.

### ازهارה!

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף את הסוללה בסוג התואם מחברת יצורן מומלצת.  
סילוק הסוללות המשמשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة اسحذاك البطارية بطريقة غير صحيحة فعلى  
اسحذاك البطارية

فقط بنفس النوع أو ما يعادلها مما أوصى به الشرمة المصنعة  
جخلص من البطاريات المصحوبة وفقاً لتعليمات الشرمة 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 Strom 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  
אוורה!

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りています。

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.

מתה בפנל האחורי

אוherה!

קיימת סכנת מתה בפנל האחורי בזמן תפעול המערכת. יש להיזהר במהלך העבודה.

هناك خطر مه التيار الكهربائي أو الطاقة المبذدة على اللحمة  
عندما يكن النظام يعمل كه حذرا عند خدمة هذا الجهاز

경고!

시스템이 동작 중일 때 후면판 (Backplane)에는 위험한 전압이나 에너지가 발생 합니다.  
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

אוורה!

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והלאומיים.

تركيب المعدات الكهربائية يجب أن يمتثل للقوانين المحلية والدولية 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

ازהרה!

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

التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقاً لجميع القوانين واللائحة البيئية عند

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 el montaje del ventilador del chasis. Mantenga los dedos, los destornilladores y todos los objetos lejos de las aberturas del ventilador

### Attention

Pieces mobiles dangereuses. Se tenir a l'écart 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!

חלקים נייחים מסוכנים. התרחק מלהבי המאזרר בפעולת הכח מסירם את חלקו המאזרר מהמארז, יתכן והמאזררים עדיין עובדים. יש להרחק למרחק בטוח את האצבעות וכל עבודה שונות מהפתחים בתחום המאזרר

تحذير! أجزاء متحركة خطيرة. ابتعد عن شفرات المروحة المتحركة. من الممكن أن المروحة لا تزال تدور عند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع ومفكات البراغي وغيرها من الأشياء بعيداً عن الفتحات في كتلة المروحة.

### 경고!

움직이는 위험한 부품. 회전하는 송풍 날개에 접근하지 마세요. 새시로부터 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、提供または指定および購入された接続ケーブル、電源コードとACアダプターを該当する地域の条例や安全基準に適合するコードサイズやプラグと共に使用下さい。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或采购的连接线,电源线和电源适配器, 包含遵照当地法规和安全要求的合规的电源线尺寸和插头. 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或採購的連接線,電源線和電源適配器, 包含遵照當地法規和安全要求的合規的電源線尺寸和插頭. 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

Nutzen Sie beim Installieren des Produkts ausschließlich die von uns zur Verfügung gestellten Verbindungskabeln, Stromkabeln und/oder Adapter, die Ihre örtlichen Sicherheitsstandards einhalten. Der Gebrauch von anderen Kabeln und Adaptern können Fehlfunktionen oder Feuer verursachen. Die Richtlinien untersagen das Nutzen von UL oder CAS zertifizierten Kabeln (mit UL/CSA gekennzeichnet), an Geräten oder Produkten die nicht mit Supermicro gekennzeichnet sind.

**¡Advertencia!**

Cuando instale el producto, utilice la conexión provista o designada o procure cables, Cables de alimentación y adaptadores de CA que cumplan con los códigos locales y los requisitos de seguridad, incluyendo el tamaño adecuado del cable y el enchufe. El uso de otros cables y adaptadores podría causar un mal funcionamiento o un incendio. La Ley de Seguridad de Aparatos Eléctricos y de Materiales prohíbe El uso de cables certificados por UL o CSA (que tienen el certificado UL / CSA en el código) para cualquier otros dispositivos eléctricos que los productos designados únicamente por Supermicro.

**Attention**

Lors de l'installation du produit, utilisez les cables de connection fournis ou désigné ou achetez des cables, cables de puissance et adaptateurs respectant les normes locales et les conditions de sécurité y compris les tailles de cables et les prises électriques appropriées. L'utilisation d'autres cables et adaptateurs peut provoquer un dysfonctionnement ou un incendie. Appareils électroménagers et la Loi sur la Sécurité Matériel interdit l'utilisation de câbles certifiés- UL ou CSA (qui ont UL ou CSA indiqué sur le code) pour tous les autres appareils électriques sauf les produits désignés par Supermicro seulement.

AC כבלים חשמליים ומותאמים

אזהרה!

אשר נרכשו או הותאמו לצורך ההתקנה, ואשר הותאמו לדרישות AC כאשר מתקנים את המזוזה, יש להשתמש בכבליים, ספקים ומוגדים הבטיחות והמקומיות, כולל מידת נכונה של הcabל והתקע. שימוש בכל cabל או מוגד מסווג אחרת, עלול לגרום לתקלה או קוצר חשמלי. בהתאם לדרישות UL או CSA - להזקק השימוש במכשירי החשמל וחוקי הבטיחות, קיים איסור להשתמש בcabלים המומסכים בלבד Supermicro עבור כל מוגדר חשמלי אחרת, אלא רק במוגדר אשר הותאם ע"י UL/CSA.

عند تركيب المنتج، قم باستخدام التوصيات المتوفرة أو المحددة أو قم بشراء الكابلات الكهربائية ومحولات التيار المتردد مع الالتزام بقوانين ومتطلبات السلامة المحلية بما في ذلك حجم الموصى والقبس السليم. استخدام أي كابلات ومحولات أخرى قد يتسبب في عطل أو حريق. يحظر قانون السلامة للأجهزة الكهربائية والمعدات استخدام الكابلات المعتمدة مع أي معدات أخرى غير المنتجات المعنية والمحددة من قبل (UL/CSA) والتي تحمل علامة CSA أو UL من قبل Supermicro.

### 전원 케이블 및 AC 어댑터

경고! 제품을 설치할 때 현지 코드 및 적절한 굽기의 코드와 플러그를 포함한 안전 요구 사항을 준수하여 제공되거나 지정된 연결 혹은 구매 케이블, 전원 케이블 및 AC 어댑터를 사용하십시오.

다른 케이블이나 어댑터를 사용하면 오작동이나 화재가 발생할 수 있습니다. 전기 용품 안전법은 UL 또는 CSA 인증 케이블 (코드에 UL / CSA가 표시된 케이블)을 Supermicro 가 지정한 제품 이외의 전기 장치에 사용하는 것을 금지합니다.

### Stroomkabel en AC-Adapter

Waarschuwing! Bij het aansluiten van het Product uitsluitend gebruik maken van de geleverde Kabels of een andere geschikte aan te schaffen Aansluitmethode, deze moet altijd voldoen aan de lokale voorschriften en veiligheidsnormen, inclusief de juiste kabeldikte en stekker. Het gebruik van niet geschikte Kabels en/of Adapters kan een storing of brand veroorzaken. Wetgeving voor Elektrische apparatuur en Materiaalveiligheid verbied het gebruik van UL of CSA -gecertificeerde Kabels (met UL/CSA in de code) voor elke andere toepassing dan de door Supermicro hiervoor beoogde Producten.

# Appendix C

## System Specifications

### Processors

Supports dual Intel Xeon 81xx/61xx/51xx/41xx/31xx and 82xx/62xx/52xx/42xx/32xx series (Socket P) processors which offer three Intel® UltraPath Interconnect (UPI) of up to 10.4 GT/s.

**Note:** Please refer to the motherboard specifications pages on our website for updates to supported processors.

### Chipset

Intel C624 chipset

### BIOS

128 Mb AMI® Flash ROM

### Memory

Supports up to 3 TB of 3DS Load Reduced DIMM (3DS LRDIMM), 3DS Registered DIMM (3DS RDIMM) and NV-DIMM DDR4 (288-pin) ECC memory 2933/2666/2400/2133 Mhz speed modules in up to 12 slots per node.

### SATA Controller

On-chip (Intel C624) controller

### Drive Bays

Twenty-four 2.5" hot-swap dual port drive bays to house NVMe drives

### Expansion Slots

Supports the following expansion slots (per node):

Two PCI-E 3.0 x16 slots

One M.2 slot/connector

One SIOM slot

### Internal Node-to-Node Connectivity

One NTB (Non-Transparent Bridge) by PLX PCI-E x8

Two 10G private Ethernet

### Chassis

SC227TS-R2K05P3; 2U Rackmount, (WxHxD) 17.2" x 3.5" x 25.6" (437mm x 89mm x 650mm)

### System Cooling

Up to five 8-cm mid-mounted cooling fans and four 4-cm exhaust fans

### Power Supply

Model: PWS-2K05A-1R

AC Input Voltage: 200-240 VAC

Rated Input Current: 11.8-9.8A

Rated Input Frequency: 50 to 60 Hz

Rated Output Power: 2000 Watt, +12V (164.68A max.), +12Vsb (2.07A max.)

### Operating Environment

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

Non-operating Temperature: -40°C to 60°C (-40°F to 140°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 32 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), CNS14336-1, CNS13438, GB4943.1-2011, GB9254-2008(Class A) and GB17625.1-2012

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

Other: VCCI-CISPR 32 and AS/NZS CISPR 32

Environmental: Directive 2011/65/EU and Delegated Directive (EU) 2015/863 and Directive 2012/19/EU

### **Perchlorate Warning**

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](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)"

## Appendix D

### UEFI BIOS Recovery

**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.

#### D.1 Overview

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 that will allow the UEFI OS loader stored in an add-on card to boot the system. The UEFI offers clean, hands-off management to a computer during system boot.

#### D.2 Recovering the UEFI BIOS Image

A UEFI BIOS flash chip consists of a recovery BIOS block and a main BIOS block (a main BIOS image). The recovery block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a healthy BIOS image if the original main BIOS image is corrupted. When the system power is turned on, the recovery block codes execute first. Once this process is complete, the main BIOS code will continue with system initialization and the remaining POST (Power-On Self-Test) routines.

**Note 1:** Follow the BIOS recovery instructions below for BIOS recovery when the main BIOS block crashes.

**Note 2:** When the BIOS recovery block crashes, you will need to follow the procedures to make a Returned Merchandise Authorization (RMA) request. (For a RMA request, please see section 3.5 for more information). Also, you may use the Supermicro Update Manager (SUM) Out-of-Band (OOB) ([https://www.supermicro.com.tw/products/info/SMS\\_SUM.cfm](https://www.supermicro.com.tw/products/info/SMS_SUM.cfm)) to reflash the BIOS.

#### D.3 Recovering the Main BIOS Block with a USB Device

This feature allows the user to recover the main 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 the recovery block is FAT (including FAT12, FAT16, and FAT32) which is 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 due to the huge volumes of folders and files stored in the device.

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

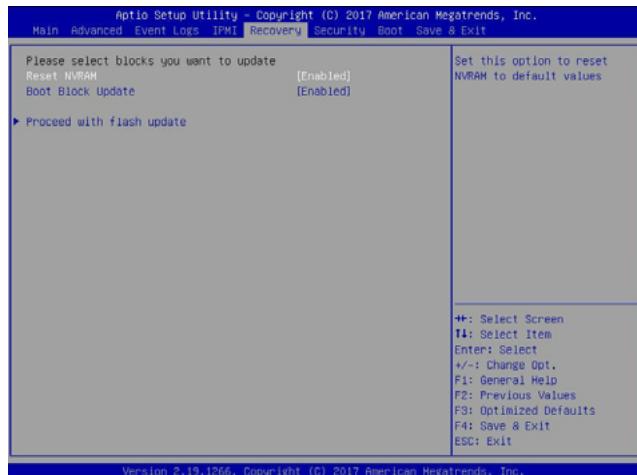
1. Using a different machine, copy the "Super.ROM" binary image file into the Root "\\" directory of a USB device or a writable CD/DVD.

**Note:** If you cannot locate the "Super.ROM" file in your drive disk, visit our website at [www.supermicro.com](http://www.supermicro.com) to download the BIOS package. Extract the BIOS binary image into a USB flash device and rename it "Super.ROM" for the BIOS recovery use.

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB drive and reset the system when the following screen appears.
3. After locating the healthy BIOS binary image, the system will enter the BIOS Recovery menu as shown below.



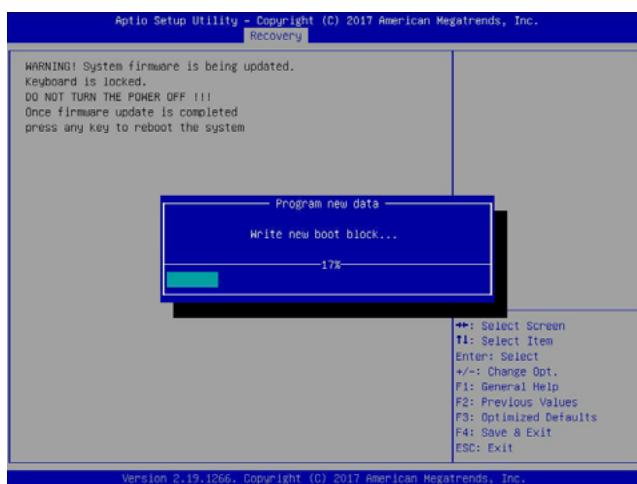
**Note:** At this point, you may decide if you want to start the BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.



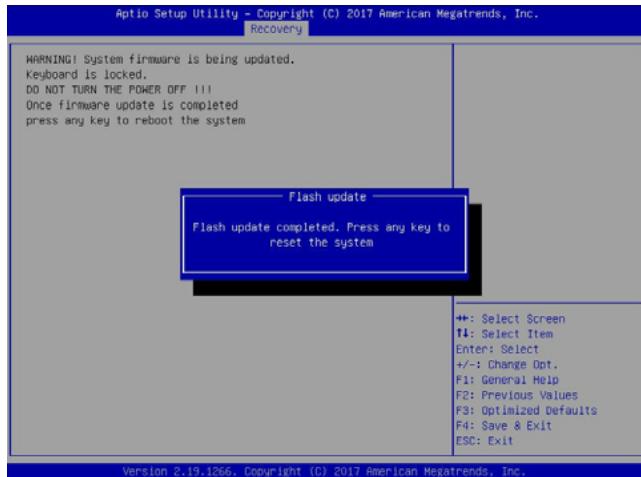
- When the screen as shown above displays, use the arrow keys to select the item "Proceed with flash update" and press the <Enter> key. You will see the BIOS recovery progress as shown in the screen below.

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

- After the BIOS recovery process is complete, press any key to reboot the system.
- Using a different system, extract the BIOS package into a USB flash drive.



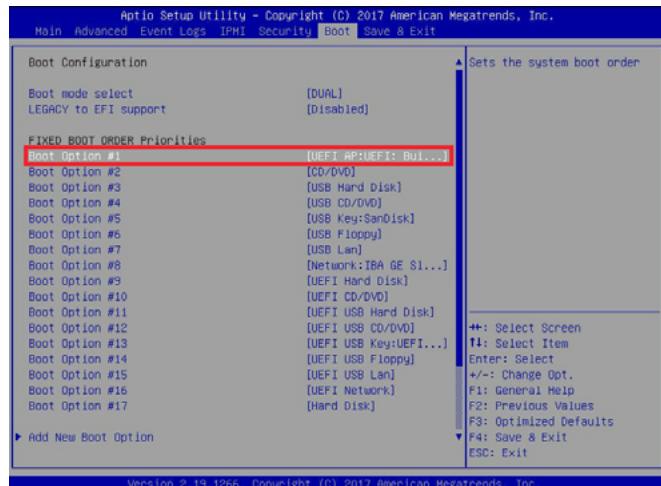
7. Press **<Del>** continuously during system boot to enter the BIOS Setup utility. From the top of the tool bar, select Boot to enter the submenu. From the submenu list, select Boot



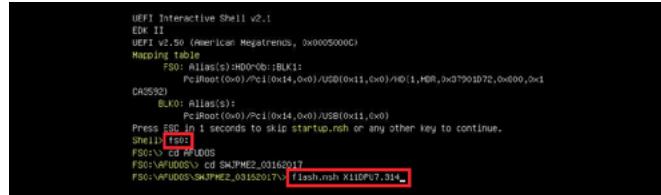
Option #1 as shown below. Then, set Boot Option #1 to [UEFI AP:UEFI: Built-in EFI Shell]. Press **<F4>** to save the settings and exit the BIOS Setup utility.

8. When the UEFI Shell prompt appears, type **fs#** to change the device directory path. Go to the directory that contains the BIOS package you extracted earlier from Step 6. Enter **flash.nsh BIOSname.###** at the prompt to start the BIOS update process.

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



9. The screen above indicates that the BIOS update process is complete. When you see the screen above, unplug the AC power cable from the power supply, clear CMOS, and plug the AC power cable in the power supply again to power on the system.

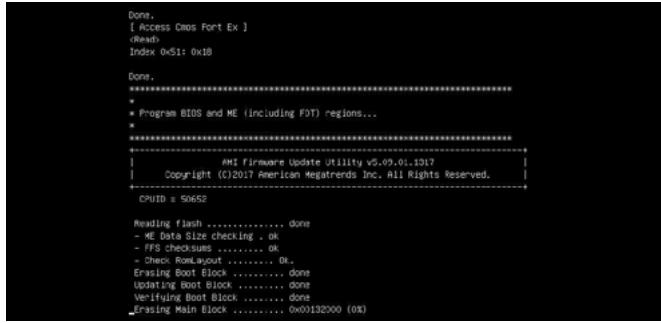


```

UEFI Interactive Shell v2.1
EDK II
UEFI v2.50 (American Megatrends, 0x0005000C)
Mapping table
  F90:\Alias($)\H00\0b:\BLK1:
    PciRoot(0x0)\%01(0x14,0x0)\USB(0x11,0x0)\H(1,0x0,0x37901072,0x00,0x1
  CA5592)
  BLK0:\Alias($):
    PciRoot(0x0)\%01(0x14,0x0)\USB(0x11,0x0)
Press ESC in 1 seconds to skip startup.nsh or any other key to continue.
SHELL: #001
F90:\> cd VFDUOS
F90:\VFDUOS\> cd SKJFME2_03162017
F90:\VFDUOS\SKJFME2_03162017\flash.nsh X10P67.0H

```

10. Press **<Del>** continuously to enter the BIOS Setup utility.



```

Done.
[ Access Cmos Port Ex ]
dread>
Index 0x51: 0x18

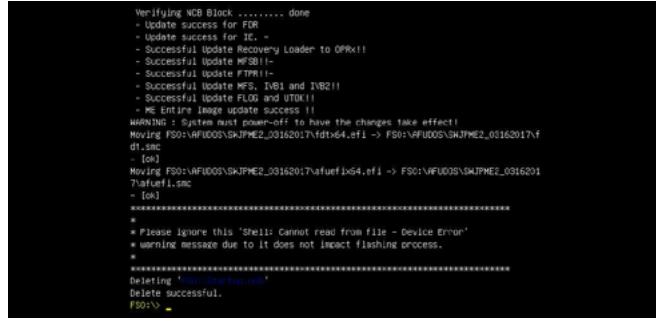
Done.
*****
* Program BIOS and ME (including FDT) regions...
*****
| AMI Firmware Update Utility v3.09.01.1917
| Copyright (C)2017 American Megatrends Inc. All Rights Reserved.
|
CPUID = 50452

Reading flash ..... done
- ME Data Size checking ..... ok
- FFS checking ..... ok
- ME Bootlayout ..... ok.
  Erasing Root Block ..... done
  Updating Boot Block ..... done
  Verifying Boot Block ..... done
  Erasing Main Block ..... 0x0132000 (0x)

```

11. Press **<F3>** to load the default settings.

12. After loading the default settings, press **<F4>** to save the settings and exit the BIOS Setup utility.



```

Verifying NCB Block ..... done
- Update success for JE. -
- Successful Update Recovery Loader to OPRX1!
- Successful Update MFSB1!
- Successful Update FTRM1!
- Successful Update MFS, IVB1 and IVB2!
- Successful Update FLO1 and UTR1
- MFS and IVB2 update success !
WARNING : System must power-off to have the changes take effect!
Moving F90:\VFDUOS\SKJFME2_03162017\fdtx64.efl -> F90:\VFDUOS\SKJFME2_03162017\f
d1.smc
- [ok]
Moving F90:\VFDUOS\SKJFME2_03162017\faufef1\g4.efl -> F90:\VFDUOS\SKJFME2_03162017\f
7\faufef1.smc
- [ok]
*****
* Please ignore this 'Shell: Cannot read from file - Device Error'
* warning message due to it does not impact flashing process.
*
Deleting F90:\VFDUOS\SKJFME2_03162017\faufef1\g4.efl
Delete successful.
F90:\>

```