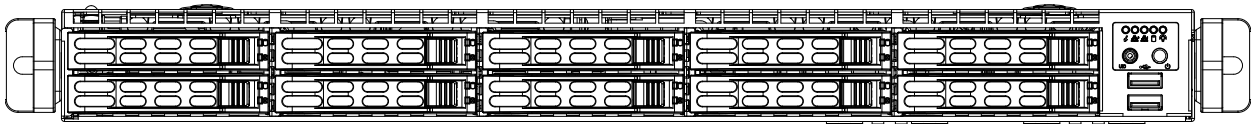




SuperServer<sup>®</sup>  
SYS-1029UX-LL1-C16  
SYS-1029UX-LL2-C16  
SYS-1029UX-LL3-C16



USER'S MANUAL

Revision 1.0a

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Manual Revision 1.0a

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# Preface

## About this Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer SYS-1029UX-LL1-C16/LL2-C16/LL3-C16. Installation and maintenance should be performed by experienced technicians only.

Please refer to the SYS-1029UX-LL1-C16/LL2-C16/LL3-C16 server specifications page on our website for updates on supported memory, processors and operating systems (<http://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/driver>
- 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: [support@supermicro.com](mailto:support@supermicro.com)

This manual may be periodically updated without notice. Please check the Supermicro website for possible updates to the manual revision level.

## 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.

# Contents

## **Chapter 1 Introduction**

1.1 Overview.....	8
1.2 Unpacking the System .....	8
1.3 System Features .....	9
1.4 Server Chassis Features.....	10
Control Panel .....	10
Front Features.....	11
Rear Features .....	12
1.5 Motherboard Layout .....	13
Quick Reference Table.....	14

## **Chapter 2 Server Installation**

2.1 Overview.....	17
2.2 Preparing for Setup .....	17
Choosing a Setup Location.....	17
Rack Precautions .....	17
Server Precautions.....	18
Rack Mounting Considerations .....	18
Ambient Operating Temperature.....	18
Airflow .....	18
Mechanical Loading.....	18
Circuit Overloading .....	19
Reliable Ground.....	19
2.3 Installing the Server into a Rack.....	20
Identifying the Sections of the Rack Rails .....	20
Installing the Optional Inner Rail Extensions.....	21
Assembling the Outer Rails .....	22
Installing the Outer Rails onto the Rack.....	23
Installing the Chassis into the Rack.....	24
Installing the Server into a Telco Rack .....	25

## **Chapter 3 Maintenance and Component Installation**

3.1 Removing Power .....	26
3.2 Accessing the System.....	26
3.3 Motherboard Components.....	27

Processor and Heatsink Installation.....	27
The Xeon Scalable Processor.....	28
Assembling the Processor Package.....	28
Removing the Dust Cover from the CPU Socket.....	31
Installing the Processor Heatsink Module (PHM) .....	32
Removing the Processor Heatsink Module from the Motherboard.....	33
Memory Installation .....	34
Memory Support .....	34
Memory Support for Intel Xeon Scalable Processors .....	34
Memory Support for 2nd Generation Intel Xeon Scalable Processors .....	35
Memory Support for Intel Scalable/2nd Generation Intel Xeon Scalable Processors .....	36
DIMM Installation .....	37
DIMM Removal .....	37
PCI Expansion Card Installation .....	38
Motherboard Battery .....	39
3.4 Chassis Components .....	40
Hard Drives .....	40
Hot-Swap for NVMe Drives .....	41
Checking the Temperature of an NVMe Drive .....	42
System Cooling .....	43
Installing Fans.....	43
Installing the Air Shroud.....	44
Power Supply .....	45
Power Supply Failure .....	45
<b>Chapter 4 Motherboard Connections</b>	
4.1 Power Connections .....	46
4.2 Headers and Connectors .....	47
Control Panel.....	50
4.3 Ports .....	52
Rear I/O Ports.....	52
Ethernet Port.....	54
4.4 Jumpers.....	55

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Explanation of Jumpers .....	55
4.5 LED Indicators .....	58
<b>Chapter 5 Software</b>	
5.1 Microsoft Windows OS Installation.....	59
5.2 Driver Installation.....	61
5.3 SuperDoctor® 5.....	62
5.4 IPMI .....	63
<b>Chapter 6 UEFI BIOS</b>	
6.1 Introduction.....	64
Starting the Setup Utility .....	64
6.2 Main Setup .....	65
6.3 Advanced Setup Configurations.....	67
6.4 Event Logs .....	101
6.5 IPMI .....	103
6.6 Security Settings .....	106
6.7 Boot Settings .....	110
6.8 Save & Exit.....	112
<b>Appendix A BIOS Error Codes</b>	
<b>Appendix B Standardized Warning Statements for AC Systems</b>	
<b>Appendix C System Specifications</b>	
<b>Appendix D UEFI BIOS Recovery</b>	
<b>Appendix E CPU-Based RAID for NVMe</b>	

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# Chapter 1

## Introduction

### 1.1 Overview

This chapter provides a brief outline of the functions and features of the SuperServer. The SYS-1029UX-LL1-C16/LL2-C16/LL3-C16 is based on the X11DPU-XLL motherboard and the SC119UTS-R751P chassis.

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
Air Shroud	MCP-310-81912-0N	2
Heatsink	SNK-P0067PSW	2
Fans	FAN-0101L4	8
Riser Card	RSC-R1UW-2E16	1
Riser Card	RSC-R1UW-E8R	1
Add-on Card for LSI-3108 SAS3	AOC-S3108L-H81R-16DD	1
Add-on Card for 4 GBe LAN ports and 1 PCI-E x8 3.0 slot	AOC-UR-I4G	1
Hard Drive Carriers (for 2.5" hot-swap drives)	MCP-220-00047-0B	10
Hard Drive Backplane	BPN-SAS3-116A-N2	1
Rack Rails: Outer Rails	MCP-290-00102-0N	1 set
Rack Rails: Inner Rail Extensions	MCP-290-00112-0N	1 set
Rack Rails: Quick Release Inner Rails	MCP-290-00120-0N	1 set

**Notes:** A Quick Reference Guide can be found on the product page of the Supermicro website.

The following safety models associated with the SYS-1029UX-LL1-C16/LL2-C16/LL3-C16 have been certified as compliant with UL or CSA: 119U-7.

### 1.2 Unpacking the System

Inspect the box the SuperServer SYS-1029UX-LL1-C16/LL2-C16/LL3-C16 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 SYS-1029UX-LL1-C16/LL2-C16/LL3-C16. Please refer to Appendix C for additional specifications.

<b>System Features</b>
<b>Motherboard</b>
X11DPU-XLL
<b>Chassis</b>
SC119UTS-R751P
<b>CPU</b>
Dual 2nd Generation Intel Xeon Scalable processors (Intel Xeon Gold 6244, 6246 and 6254 for -LL1, -LL2, and -LL3, respectively)
<b>Socket Type</b>
Socket P
<b>Memory</b>
Sixteen DIMM slots to support up to 4TB of ECC, DDR4-2933/2666/2400 Registered DIMM (RDIMM) memory Note: Twelve 16GB DIMMs have been pre-installed in the system.
<b>Chipset</b>
Intel C621 chipset
<b>Expansion Slots (supported)</b>
Two PCI-E 3.0 x16 slots (with included riser card) One PCI-E 3.0 x8 (with included riser card)
<b>Hard Drives</b>
Ten 2.5" hot-swap hard drives
<b>Power</b>
Dual 750W (redundant) power supply modules (p/n PWS-751P-1R)
<b>Form Factor</b>
1U rackmount
<b>Dimensions</b>
(WxHxD) 17.2 x 1.7 x 27.8 in. (437 x 43 x 706 mm)

## 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.

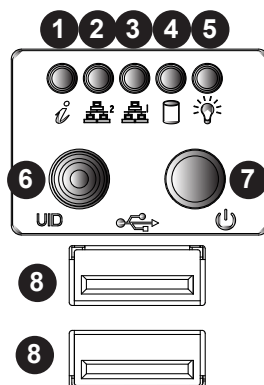


Figure 1-1. Control Panel View

Control Panel Features		
Item	Feature	Description
1	Information LED	See table below for details.
2	NIC2 LED	Indicates network activity on LAN port 2 when flashing
3	NIC1 LED	Indicates network activity on LAN port 1 when flashing
4	HDD LED	Indicates activity on the hard drive when flashing.
5	Power LED	Indicates power is being supplied to the system's power supply unit. This LED should normally be illuminated when the system is operating.
6	UID LED	Depressing the UID (unit identifier) button illuminates an LED on the front and rear of the chassis for easy system location in large stack configurations. The LED will remain on until the button is pushed a second time. Another UID button on the rear of the chassis serves the same function.
7	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.
8	USB Ports	USB 3.0 Ports

Information LED	
Status	Description
Continuously on and red	An overheat condition has occurred. (This may be caused by cable congestion.)
Blinking red (1Hz)	Fan failure, check for an inoperative fan.
Solid blue	UID has been activated locally to locate the server in a rack environment.
Blinking blue	UID has been activated using IPMI to locate the server in a rack environment.

## Front Features

The SC119UTS-R751P is a 1U chassis. See the illustration below for the features included on the front of the chassis.

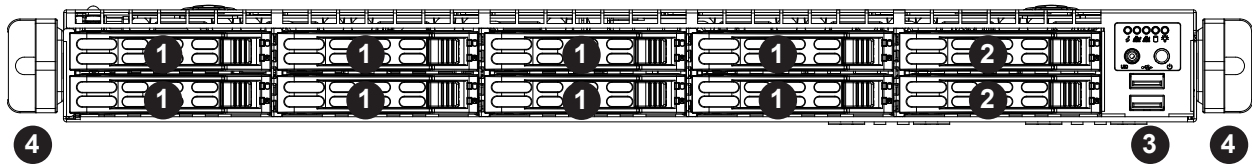


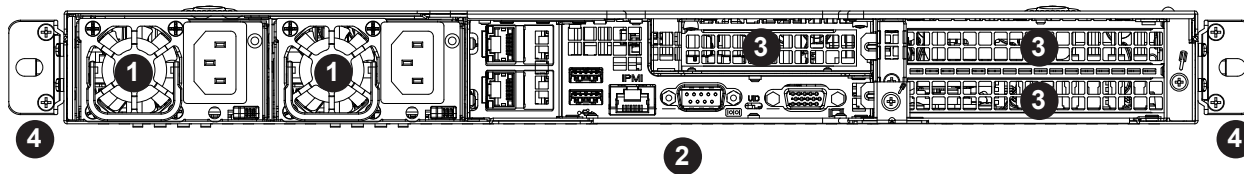
Figure 1-2. Chassis Front View

Front Chassis Features		
Item	Feature	Description
1	HDD	Hot-swap 2.5" SAS/SATA hard disk drive*
2	HDD	Hot-swap 2.5" NVMe hard disk drive
3	Control Panel	Front control panel with LEDs and buttons (see preceding page)
4	Rack Ear Brackets	Attaches server chassis to the rack

**Note:** these drives are supported by the SAS controller, even when SATA drives are being used.

## 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 Supply	750W redundant power supply (p/n PWS-751P-1R)
2	I/O Back Panel	Rear I/O ports (see Section 4.3)
3	Expansion Card Slot	Slot for expansion card (requires pre-installed riser cards)
4	Rack Ear Brackets	Attaches server chassis to the rack

## 1.5 Motherboard Layout

Below is a layout of the X11DPU-XLL 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.

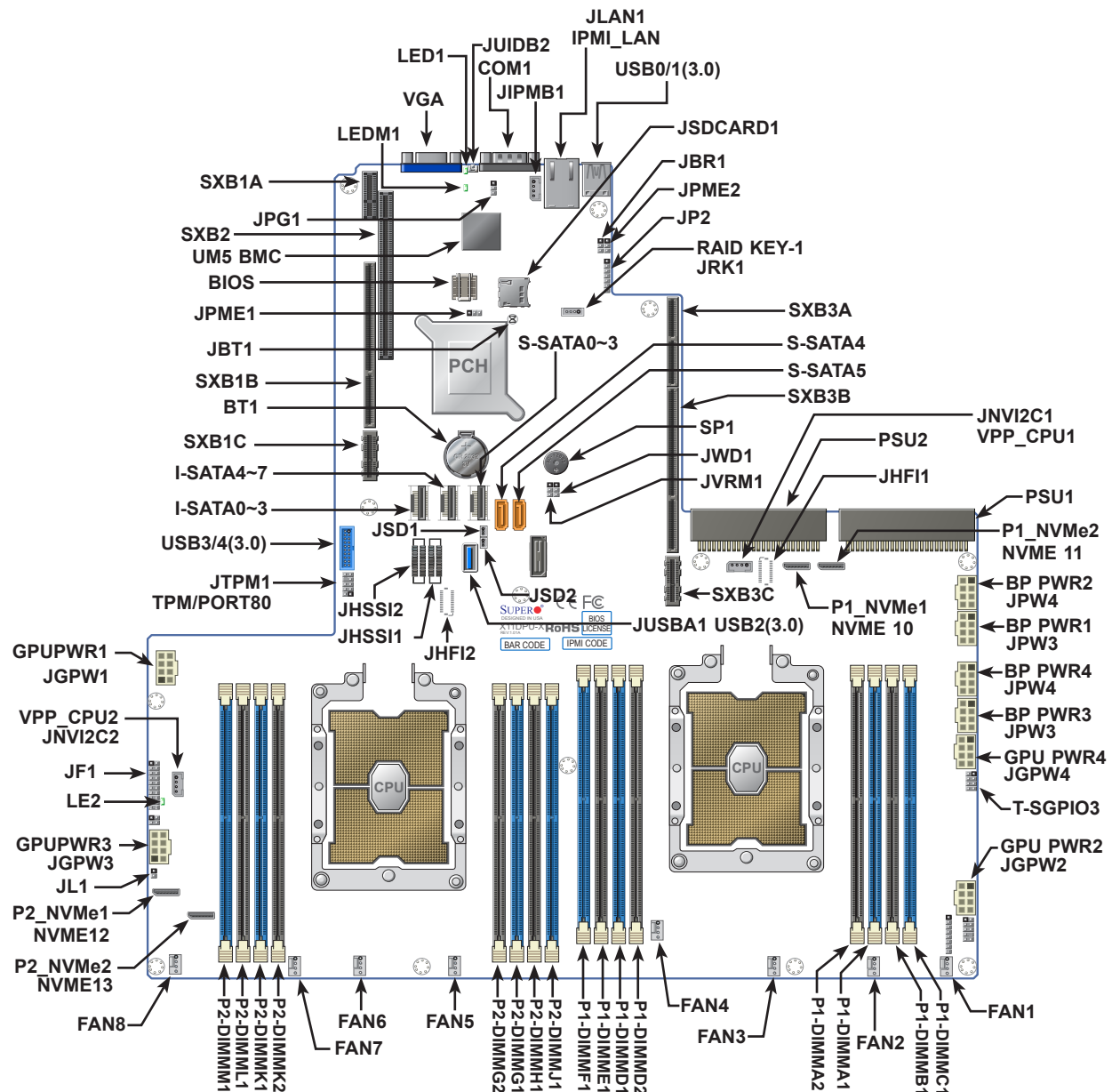


Figure 1-4. Motherboard Layout

### Notes:

- "■" indicates the location of pin 1.
- Jumpers and LED indicators not indicated are used for internal testing only.

## Quick Reference Table

Jumper	Description	Default Setting
JBR1	BIOS Recovery	Pins 1-2 (Normal)
JBT1	CMOS Clear	Open (Normal)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPME1	Recovery Mode	Pins 1-2 (Normal)
JPME2	Manufacturing Mode	Pins 1-2 (Normal)
JVRM1	VRM Programming	Pins 1-2 (Default)
JWD1	Watch Dog	Pins 1-2 (Reset)

LED	Description	Status
LE2	Standby PWR LED	Green: SB Power On
LED1	UID LED	Solid Blue: Unit Identified
LEDM1	BMC Heartbeat LED	Blinking Green: BMC Normal

Connector	Description
BIOS	BIOS
BT1	Onboard Battery
COM1	COM Port
FAN1 ~ FAN8	System/CPU Fan Headers (FAN1: CPU Fan)
IPMI_LAN JLAN1	Dedicated IPMI LAN Port
I-SATA0 ~ I-SATA7	Intel® PCH SATA 3.0 Ports
JF1	Front Control Panel Header
JGPW1 - JGPW4	(GPU PWR1 - GPU PWR4) GPU and VGA Device Power Connectors
JHFI1, JHFI2	HFI connector headers for CPU1 and CPU2 respectively (see Notes below)
JHSS11 - JHSS12	Connector for FPGA GPIO signal
JIPMB1	System Management Bus Header for IPMI2.0
JL1	Chassis Intrusion Header
JNVI <sup>2</sup> C1, JNVI <sup>2</sup> C2	VPP_CPU1, VPP-CPU2 - System Management Bus
JP2	CPLD programming
JPW1 - JPW4	(BP PWR1 - BP PWR4) Backplane power connectors for hard drives
JRK1	Intel Raid Key Header

**Notes:** For the HFI sideband carrier card to function properly, install the HFI card to an appropriate PCI-E slot of your choice, and install an F model processor in CPU Socket#1. Connect an HFI cable from the HFI card to JHFI header and connect an IFP cable from HFI card to the processor. (See Chapter 3 for more details.)

<b>Connector</b>	<b>Description</b>
JSDCARD1	SD Card Socket (reserved for manufacturer's use)
JSD1 - JSD2	SATA DOM Power Connectors
JTPM1 TPM/PORT80	Trusted Platform Module/Port 80 Connector
JUIDB2	Unit Identifier (UID) Switch
JUSB3 USB3/4(3.0)	USB 3.0 header (Ports 3 and 4)
JUSBA1 USB2(3.0)	Type A USB 3.0 header (Port 2)
NVME10, NVME11	P1_NVMe1, P1_NVMe2; On-Board NVMe 1 and 2 for high speed PCI-E storage devices on CPU1
NVME12, NVME13	P2_NVMe1, P2_NVMe2; On-Board NVMe 1 and 2 for high speed PCI-E storage devices on CPU2
PSU1	Power Supply Unit 1
PSU2	Power Supply Unit 2
SATA 4,5	SATA Ports (Supports SuperDOM)
SP1	Internal Speaker/Buzzer
S-SATA0-3	Intel® PCH SATA 3.0 Ports
SXB1	WIO Left Riser Slot
SXB2	WIO Right Riser Slot
SXB3	Ultra Riser Slot
T-SGPIO3	Serial General Purpose Input/Output Header
USB0/1 (3.0)	Back panel Universal Serial Bus (USB) 3.0 Port
VGA	VGA Port

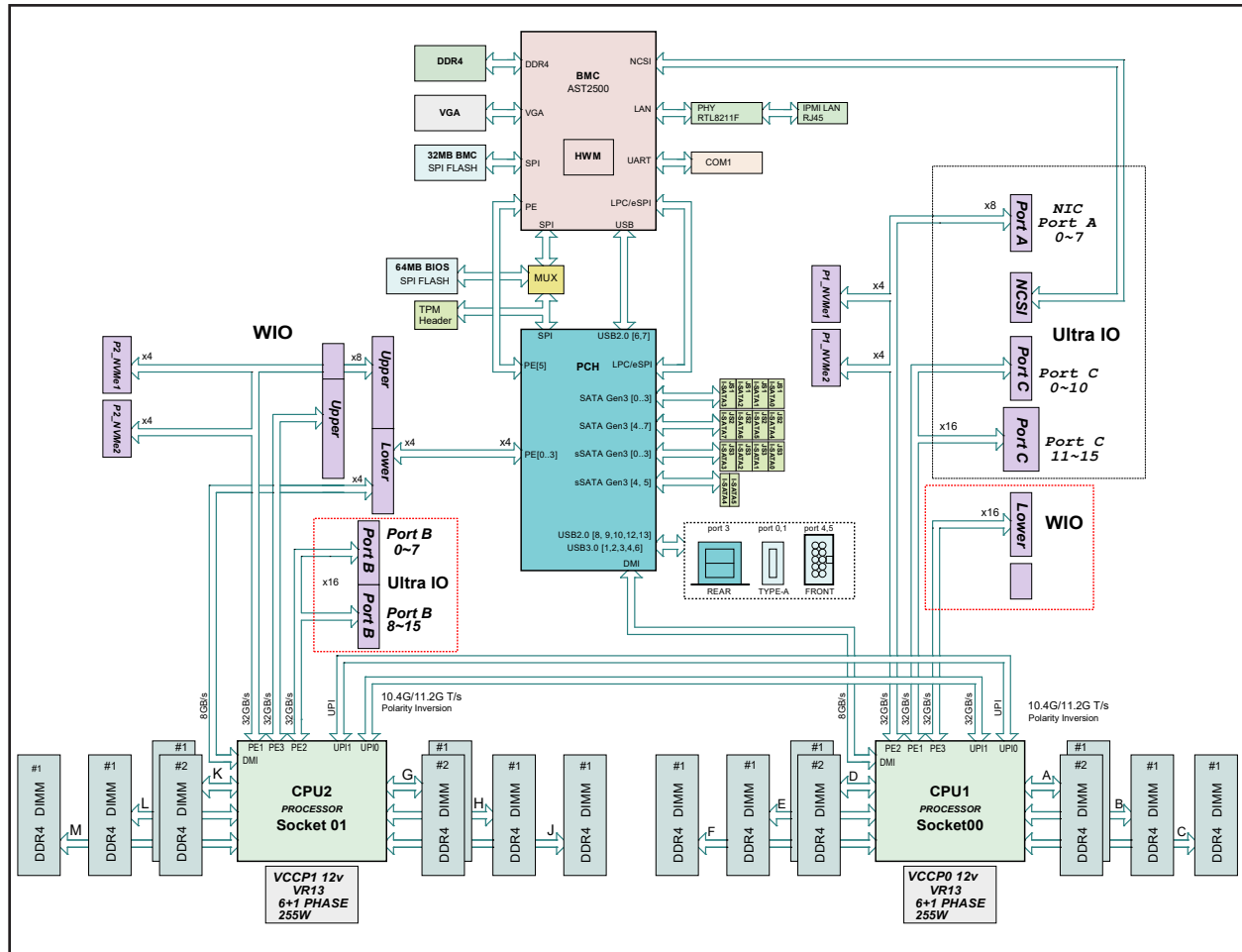


Figure 1-5. Intel C621 Chipset: System Block Diagram

**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.).
- 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 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.

## **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.



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.

## 2.3 Installing the Server into a Rack

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

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

### Identifying the Sections of the Rack Rails

The chassis package includes two sets of rack rails, one set for the right side of the chassis and one for the left. Each set consists of an inner rail that is fixed directly to the chassis and an outer rail that attaches to the rack.

The inner rails are pre-attached and do not interfere with normal use of the chassis if you decide not to install it into a rack.

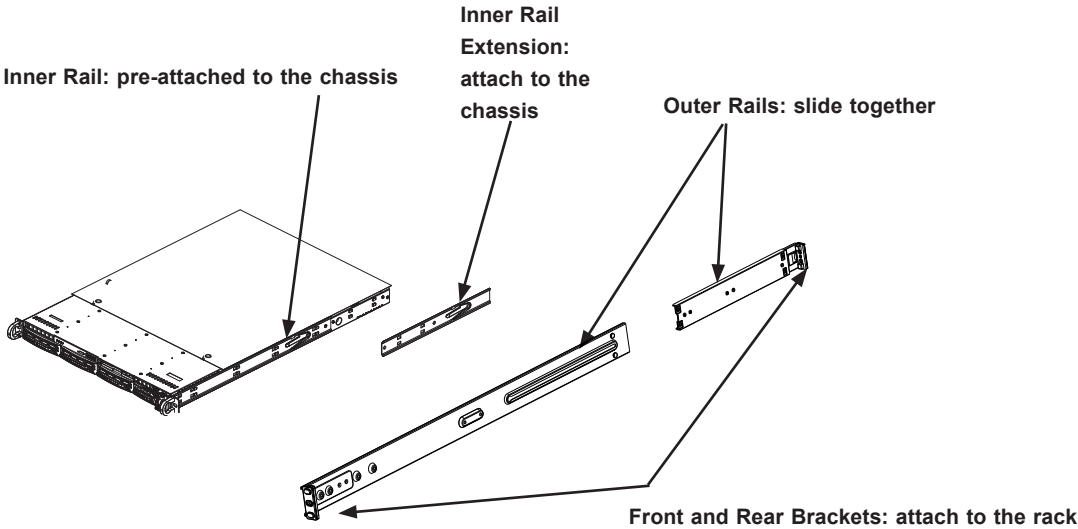


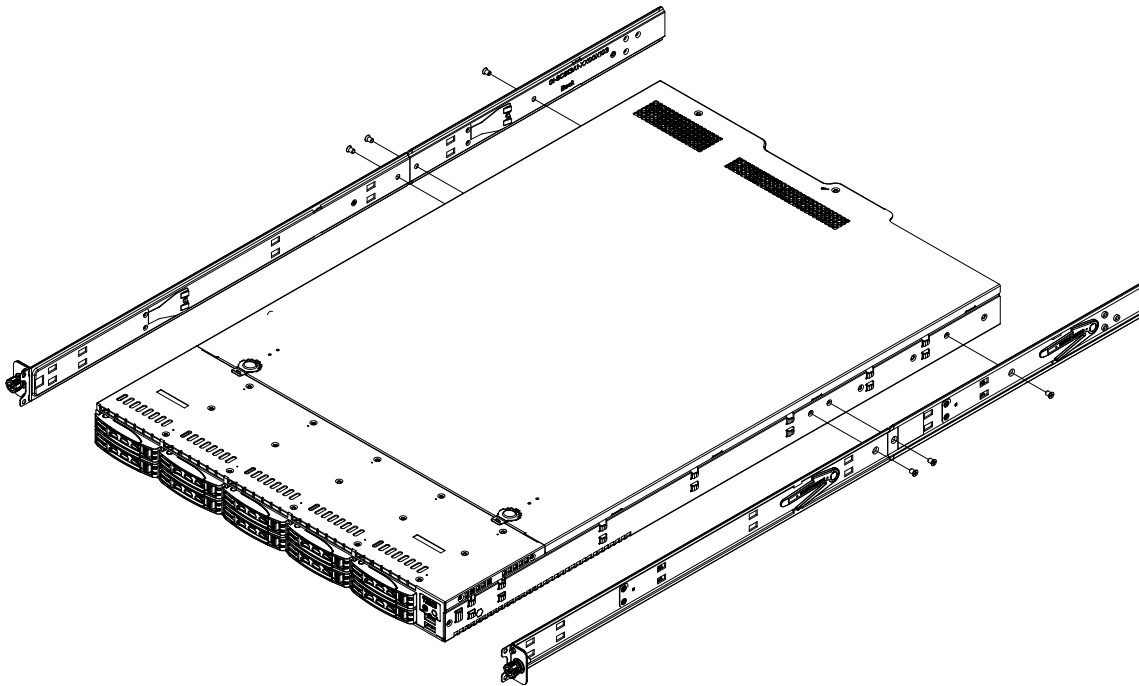
Figure 2-1. Identifying the Sections of the Rack Rails

## Installing the Optional Inner Rail Extensions

Attaching the optional inner rail extensions allows you to pull the server farther out of the rack. Do not put downward force on the chassis when it is fully extended.

### *Installing the Inner Rail Extensions*

1. Place the inner rail extensions at the side of the chassis. Align the holes of the inner rail extension with the hooks on the side of the chassis. Make sure the extension faces outward like the inner rail.
2. Slide the extension toward the front of the chassis and under the hooks until the quick release bracket snaps into place, securing the extension to the chassis.
3. If desired, you can install a screw to further secure the extension to the chassis.
4. Repeat for the other inner rail extension.



**Figure 2-2. Installing the Inner Rail Extensions**



**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.

## Assembling the Outer Rails

Each outer rail comes in two sections that must be assembled before mounting onto the rack.

### *Assembling the Outer Rails*

1. Identify the left and right outer rails by examining the ends, which bend outward. Match the left front outer rail with the left rear outer rail and the same for the right rails.
2. Align the round post in the rear rail (B) with the round hole at the end of the slot in the front rail (A), and slide the front section into the rear section.

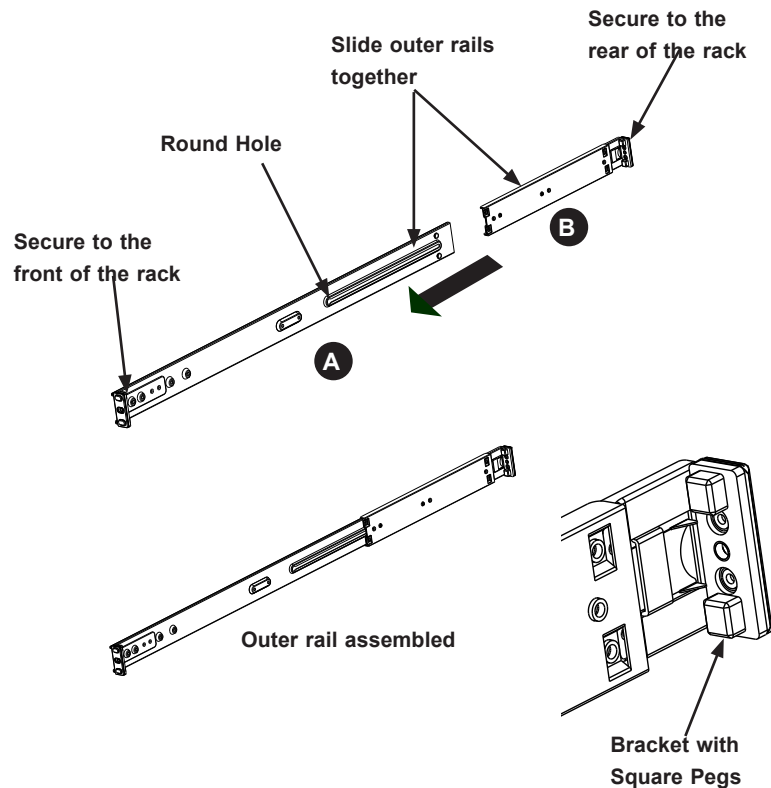


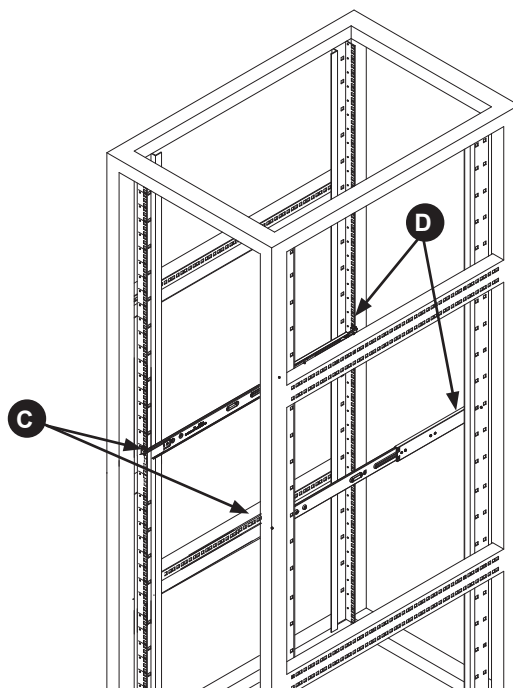
Figure 2-3. Assembling the Outer Rails

## Installing the Outer Rails onto the Rack

Each end of the assembled outer rail includes a bracket with square pegs to fit into your rack holes. If you have an older rack with round holes, these brackets must be removed, and you must use screws to secure the rail to the rack.

### **Outer Rail Installation**

1. Align the square pegs on the front end of the rail with the square holes on the front of the rack (C). Push the rail into the rack until the quick release bracket snaps into place, securing the rail to the rack. Keep the rail horizontal.
2. Adjust the rail to reach just past the full depth of your rack.
3. Align the square pegs on the rear end of the rail to the holes on the rack (D) and push the rail into the rack until the quick release bracket snaps into place, securing the rail to the rack.
4. Repeat the procedure for the other outer rail assembly.



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

**Note:** Figure is for illustrative purposes only. Always install servers to the bottom of a rack first.

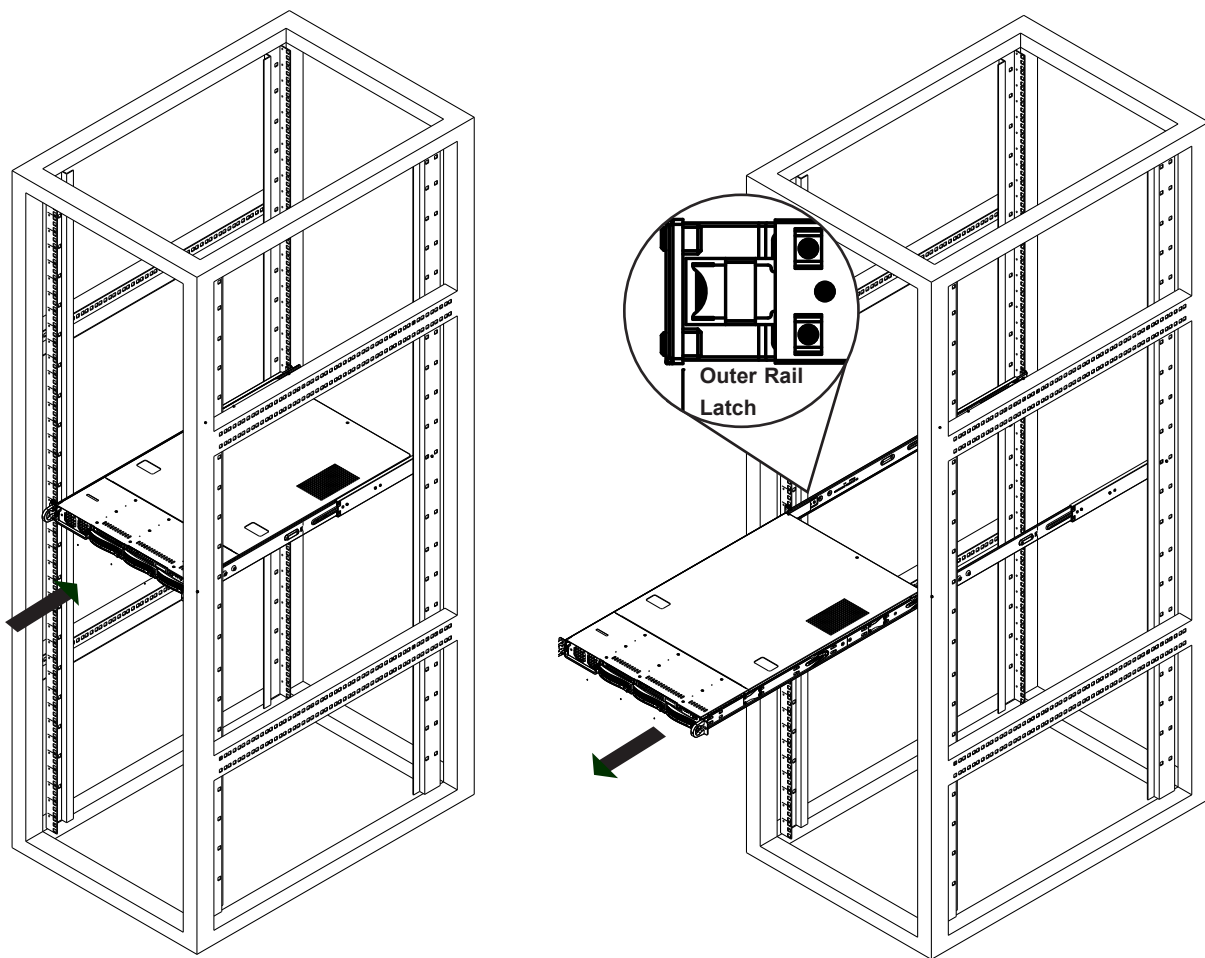
## Installing the Chassis into the Rack

### *Installing the Chassis into the Rack*

1. Slide the inner rail extensions into the front of the outer rails.
2. Push the chassis backward into the rack until it clicks into the locked position.

### *Removing the Chassis from the Rack*

1. To remove the chassis from the rack, press the outer rail latch to release the chassis.
2. Carefully slide the chassis forward, off the outer rails and out of the chassis.



**Figure 2-5. Installing/Removing the Chassis into/from the Rack**

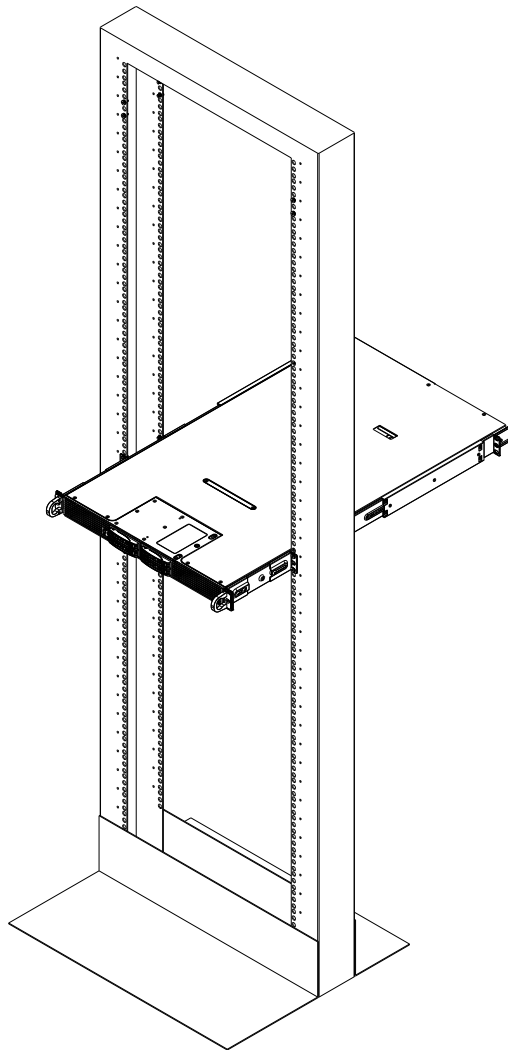
**Note:** Figure is for illustrative purposes only. Always install servers to the bottom of a rack first.

## Installing the Server into a Telco Rack

Two optional L-shaped brackets are needed to install the server to a telco (open type) rack.

### *Installing the Server into a Telco Rack*

1. Determine how far forward the server will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back.
2. If a bezel is included on your server, remove it.
3. Attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the telco rack.
4. Finish by sliding the chassis into the rack and tightening the brackets to the rack.



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

**Note:** Figure is for illustrative purposes only. Always install servers to the bottom of a rack first.

## 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 Accessing the System

The SC119UTS-R751P features a removable top cover, which allows easy access to the inside of the chassis.

#### ***Removing the Top Cover***

1. Disconnect the chassis from any power source if necessary (see above).
2. Press the two release buttons to remove the cover from the locked position. (Press both tabs at the same time.)
3. Once the top cover is released from the locked position, slide the cover toward the rear of the chassis.
4. Lift the cover off the chassis.
5. To remove the system from the rack completely, press the locking tabs in the chassis rails (push the right-side tab down and the left-side tab up) to continue to pull the system out past the locked position.

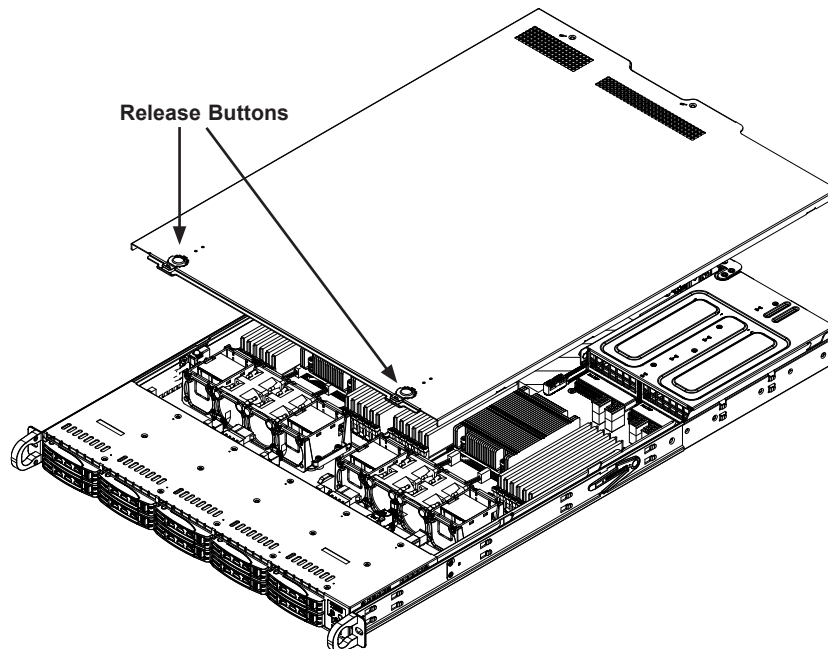


Figure 3-1. Removing the Top Cover

## 3.3 Motherboard Components

### Processor and Heatsink Installation

The Intel® Xeon® Scalable 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.

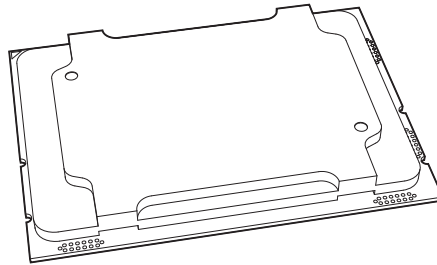
The processor (CPU) and heatsink should be assembled together first to form the processor heatsink module (PHM), and then install the PHM into the CPU socket.

**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***



**Non-F model Processor**

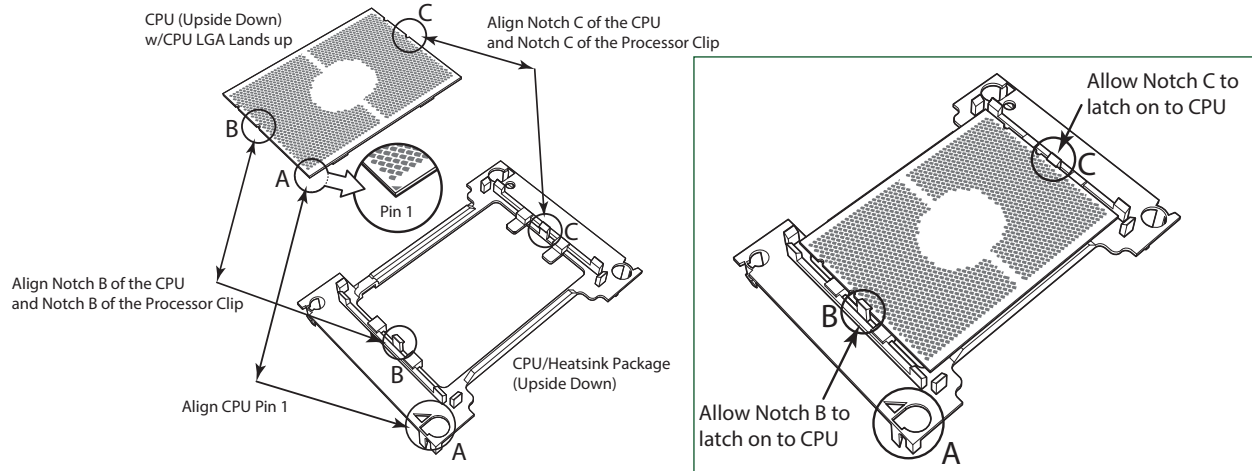
**Figure 3-2. Xeon Scalable Processors**

### ***Assembling the Processor Package***

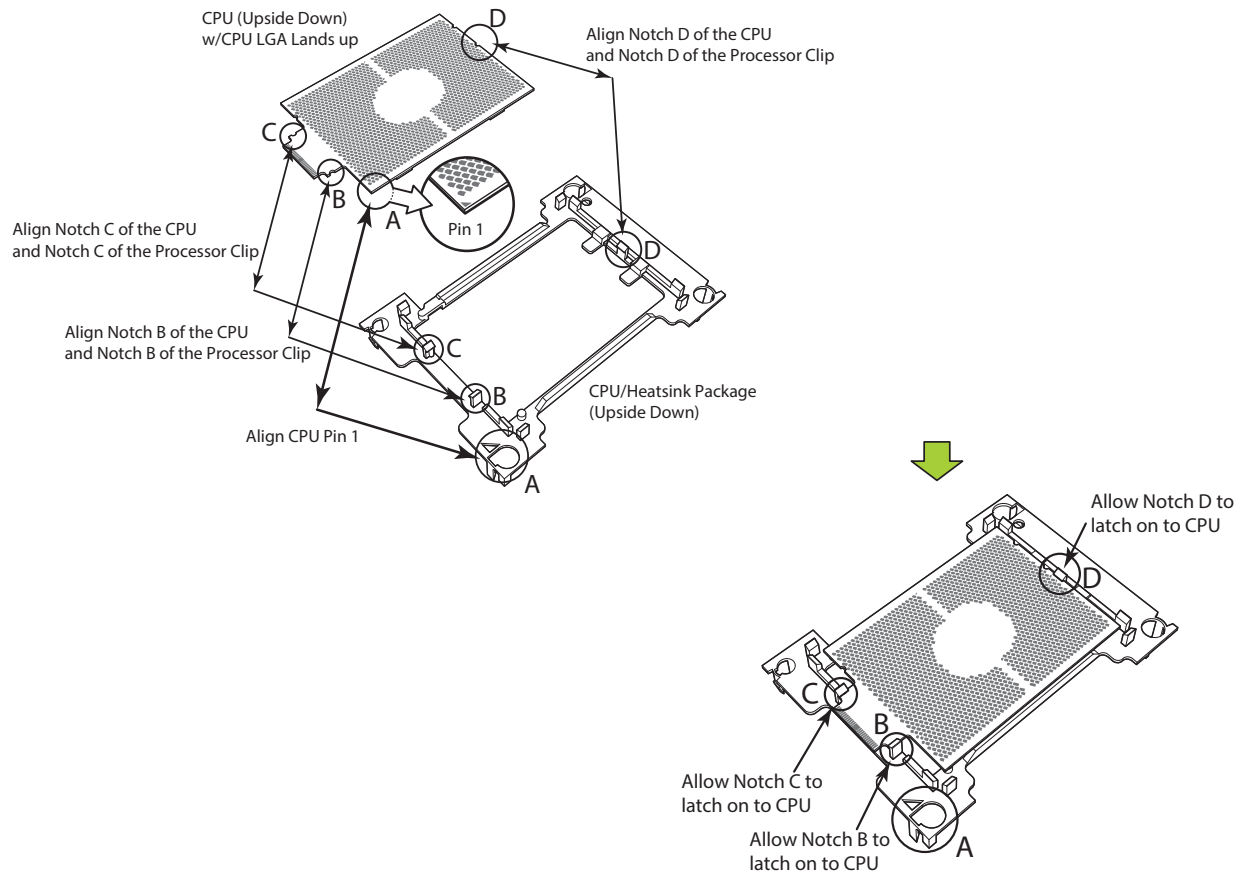
Attach the processor to the thin processor clip to create the processor package.

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.



**Figure 3-3. Processor Package Assembly for the non-F Model Processors**

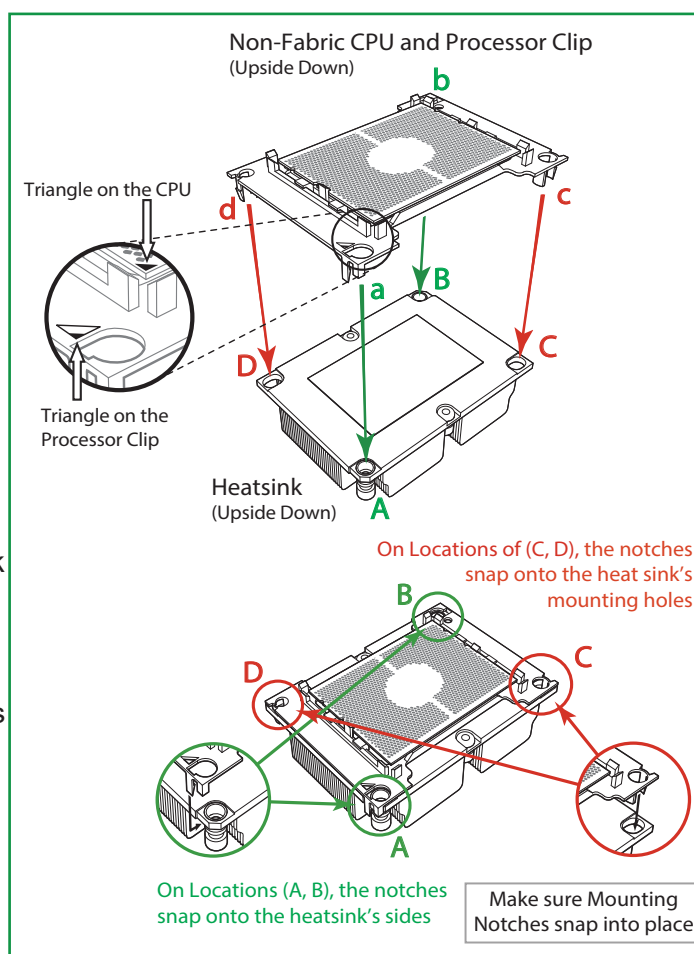


**Figure 3-4. Processor Package Assembly for the F Model Processors**

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.

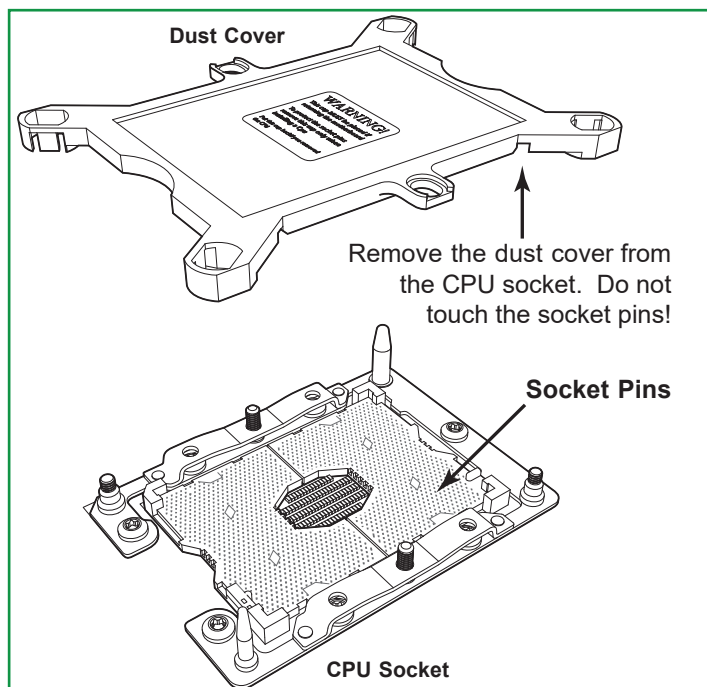


**Figure 3-5. Assembling the Processor Heatsink Module**

### ***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.



**Figure 3-6. 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 lbf.in of torque when tightening the screws to avoid damaging the processor or the socket.

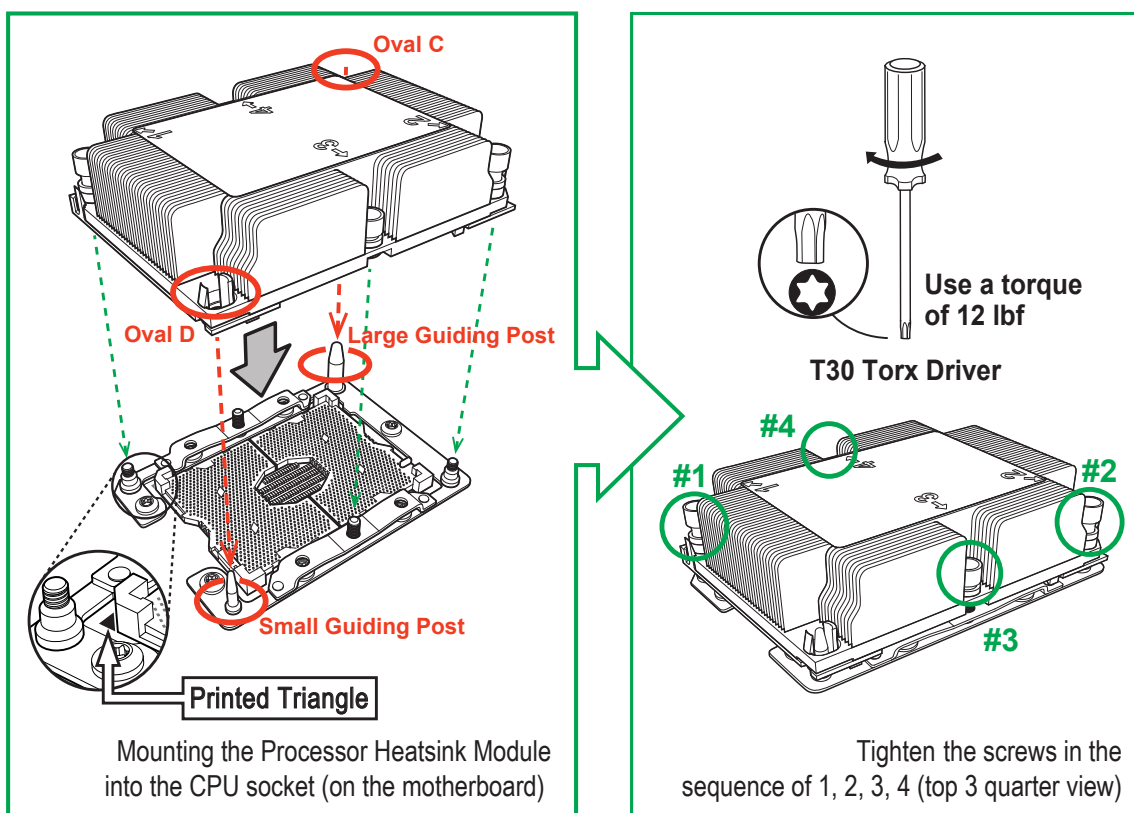
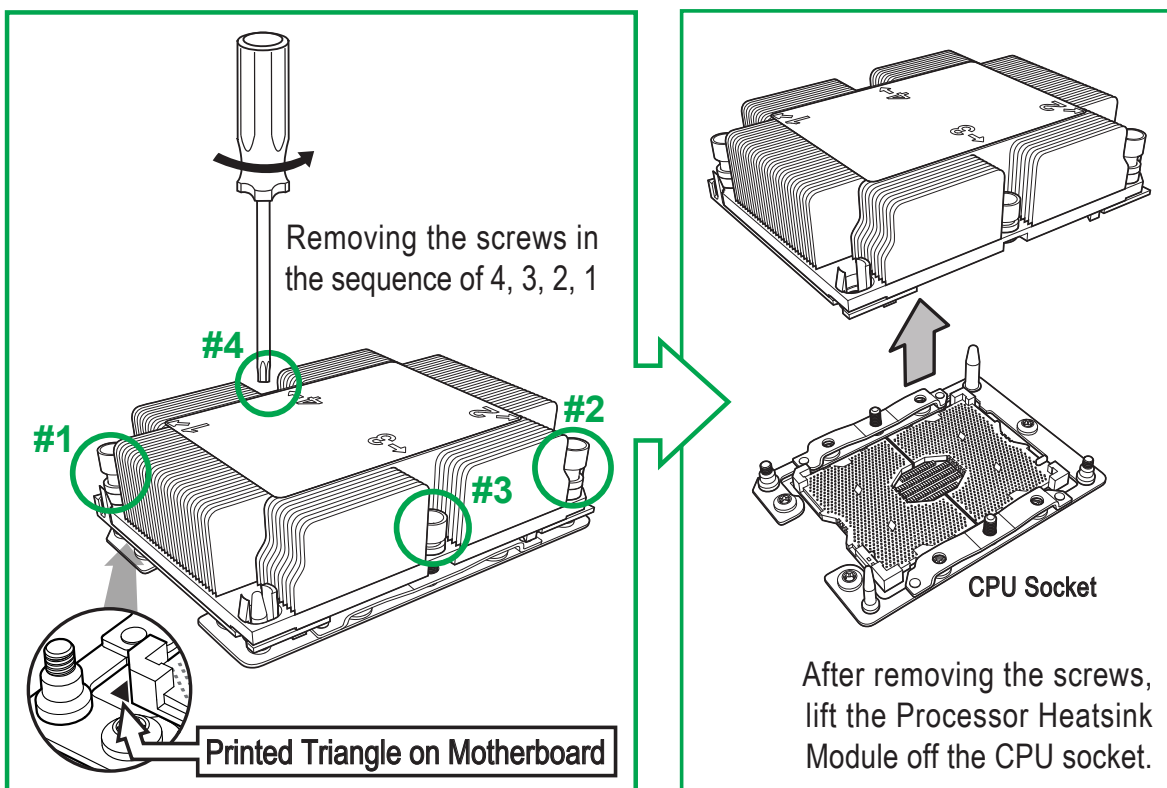


Figure 3-7. Installing the Processor Heatsink Module

### ***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.



**Figure 3-8. Removing the Processor Heatsink Module**

## Memory Installation

### Memory Support

The X11DPU-XLL features 16 DIMM slots that can support up to 4TB of ECC, DDR4-2933/2666/2400 Registered DIMM (RDIMM) memory.

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

### Memory Support for Intel Xeon Scalable Processors

DDR4 Memory Support for Two Slots per Channel					
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s)	
				Two Slots per Channel	
				One DIMM per Channel	Two DIMMs per Channel
		4 Gb	8 Gb	1.2 Volts	1.2 Volts
RDIMM	SRx4	8 GB	16 GB	2666	2666
	SRx8	4 GB	8 GB	2666	2666
	DRx8	8 GB	16 GB	2666	2666
	DRx4	16 GB	32 GB	2666	2666
RDIMM 3Ds	QRX4	N/A	2H-64GB	2666	2666
	8RX4	N/A	4H-128GB	2666	2666
LRDIMM	QRx4	32 GB	64 GB	2666	2666
LRDIMM 3Ds	QRX4	N/A	2H-64GB	2666	2666
	8Rx4	N/A	4H-128 GB	2666	2666

DDR4 Memory Support for One Slot per Channel					
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s)	
				One Slot per Channel	
				One DIMM per Channel	
		4 Gb	8 Gb	1.2 Volts	
RDIMM	SRx4	8 GB	16 GB	2666	
	SRx8	4 GB	8 GB	2666	
	DRx8	8 GB	16 GB	2666	
	DRx4	16 GB	32 GB	2666	
RDIMM 3Ds	QRX4	N/A	2H-64GB	2666	
	8RX4	N/A	4H-128GB	2666	
LRDIMM	QRx4	32 GB	64 GB	2666	
LRDIMM 3Ds	QRX4	N/A	2H-64GB	2666	
	8Rx4	N/A	4H-128 GB	2666	

Check the Supermicro website for possible updates to memory support.

**Memory Support for 2nd Generation Intel Xeon Scalable Processors**

DDR4 Memory Support for Two Slots per Channel					
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s)	
				Two Slots per Channel	
				One DIMM per Channel	Two DIMMs per Channel
		4 Gb	8 Gb	1.2 Volts	1.2 Volts
RDIMM	SRx4	8 GB	16 GB	2933	2933
	SRx8	4 GB	8 GB	2933	2933
	DRx8	8 GB	16 GB	2933	2933
	DRx4	16 GB	32 GB	2933	2933
RDIMM 3Ds	QRX4	N/A	2H-64GB	2933	2933
	8RX4	N/A	4H-128GB	2933	2933
LRDIMM	QRx4	32 GB	64 GB	2933	2933
LRDIMM 3Ds	QRX4	N/A	2H-64GB	2933	2933
	8Rx4	N/A	4H-128 GB	2933	2933

DDR4 Memory Support for One Slot per Channel					
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s)	
				One Slot per Channel	
				One DIMM per Channel	
		4 Gb	8 Gb	1.2 Volts	
RDIMM	SRx4	8 GB	16 GB	2933	
	SRx8	4 GB	8 GB	2933	
	DRx8	8 GB	16 GB	2933	
	DRx4	16 GB	32 GB	2933	
RDIMM 3Ds	QRX4	N/A	2H-64GB	2933	
	8RX4	N/A	4H-128GB	2933	
LRDIMM	QRx4	32 GB	64 GB	2933	
LRDIMM 3Ds	QRX4	N/A	2H-64GB	2933	
	8Rx4	N/A	4H-128 GB	2933	

Check the Supermicro website for possible updates to memory support.

## Memory Support for Intel Scalable/2nd Generation Intel Xeon Scalable Processors

Memory Population for X11 DP Motherboard, 16 DIMM Slots	
<b>With 1 CPU</b>	<b>Memory Population Sequence</b>
1 CPU & 1 DIMM	CPU1: P1-DIMMA1
1 CPU & 2 DIMMs	CPU1: P1-DIMMA1/P1-DIMMD1
1 CPU & 3 DIMMs	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1
1 CPU & 4 DIMMs	CPU1: P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1
1 CPU & 5 DIMMs (Unbalanced: not recommended)	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1
1 CPU & 6 DIMM	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1
1 CPU & 7 DIMMs (Unbalanced: not recommended)	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMA2/P1-DIMMD1/P1-DIMME1/ P1-DIMMF1
1 CPU & 8 DIMMs (Unbalanced: not recommended)	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMA2/P1-DIMMD2/P1-DIMMD1/ P1-DIMME1/P1-DIMMF1
<b>With 2 CPUs</b>	<b>Memory Population Sequence</b>
2 CPUs & 2 DIMMs	CPU1: P1-DIMMA1 CPU2: P2-DIMMA1
2 CPUs & 4 DIMMs	CPU1: P1-DIMMA1/P1-DIMMD1 CPU2: P2-DIMMA1/P2-DIMMD1
2 CPUs & 6 DIMMs	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1 CPU2: P2-DIMMC1/P2-DIMMB1/P2-DIMMA1
2 CPUs & 8 DIMMs	CPU1: P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1 CPU2: P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1
2 CPUs & 10 DIMMs	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1 CPU2: P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1
2 CPUs & 12 DIMMs	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
2 CPUs & 14 DIMMs (Unbalanced: not recommended)	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMA2/P1-DIMMD1/P1-DIMME1/ P1-DIMMF1 CPU2: P2-DIMMC1/P2-DIMMB1/P2-DIMMA1/P2-DIMMA2/P2-DIMMD1/P2-DIMME1/ P2-DIMMF1
2 CPUs & 16 DIMMs (Unbalanced: not recommended)	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMA1/P1-DIMMA2/P1-DIMMD2/P1-DIMMD1/ P1-DIMME1/P1-DIMMF1 CPU2: P2-DIMMC1/P2-DIMMB1/P2-DIMMA1/P2-DIMMA2/P2-DIMMD2/P2-DIMMD1/ P2-DIMME1/P2-DIMMF1

## DIMM Installation

1. Insert DIMMs in the following order: P1-DIMMA1, P1-DIMMD1, P1-DIMMB1, P1-DIMME1, P1-DIMMC1 P1-DIMMF1. 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 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 into the slot.

## DIMM Removal

Reverse the steps above to remove the DIMMs from the motherboard.

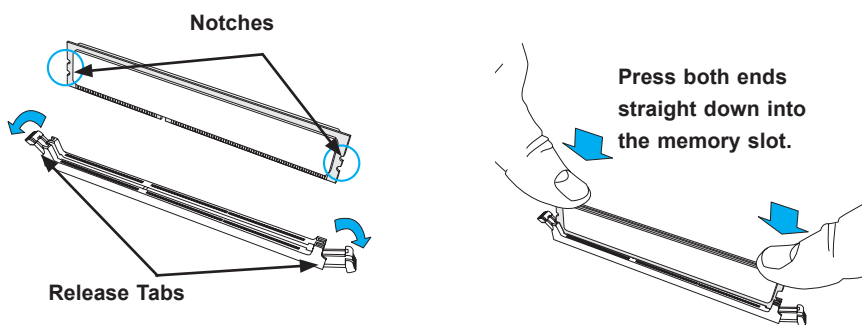


Figure 3-9. Installing DIMMs

## PCI Expansion Card Installation

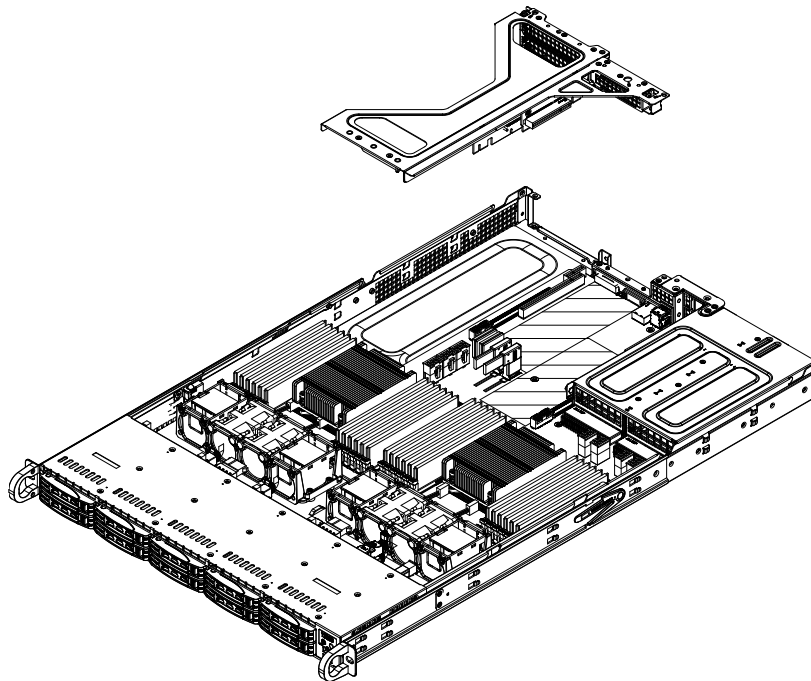
The system includes two pre-installed riser cards (p/n RSC-R1UW-E8R and RSC-R2-66). Riser cards on chassis brackets allow you to add PCI expansion cards.

- RSC-R1UW-E8R supports one standard size PCI-E x8 expansion card.
- RSC-R1UW-2E16 supports two standard size PCI-E x16 expansion cards.

### *Installing PCI Expansion Cards*

Perform the following steps to install an add-on card:

1. Remove power from the system as described in section 3.1.
2. Remove the chassis cover as described in section 3.2.
3. Remove the bracket and sections of the chassis in the rear.
4. Insert the expansion card into a slot on the riser card while aligning the expansion card backplate with the open slot in the rear of the chassis.
5. Insert the riser card into the serverboard expansion slot while aligning the riser card bracket with the rear of the chassis. The riser card bracket is toolless and has pins that snap into holes on the rear of the chassis.



**Figure 3-10. Riser Card Bracket and Expansion Slots**

## Motherboard Battery

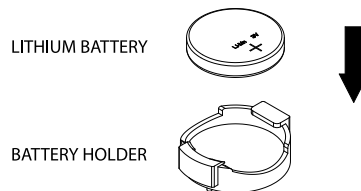
The motherboard uses non-volatile memory to retain system information when system power is removed. This memory is powered by a lithium battery residing on the motherboard.

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



**Figure 3-11. 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).

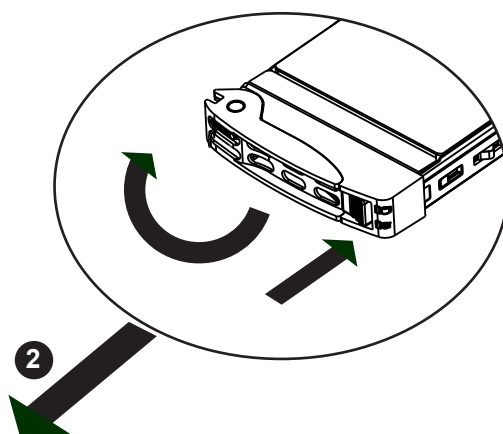
## 3.4 Chassis Components

### Hard Drives

The SYS-1029UX-LL1-C16/LL2-C16/LL3-C16 supports 10 hot-swappable 2.5" hard drives. The hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. System power may remain on when removing carriers with drives installed. These carriers also help promote proper airflow for the drive bays. For this reason, even empty carriers without drives installed must remain in the chassis..

#### ***Removing a Hot-Swap Drive Carrier***

1. Push the release button on the carrier. This extends the drive carrier handle.
2. Swing the handle fully out.
3. Grasp the handle and use it to pull the drive carrier out of its bay.

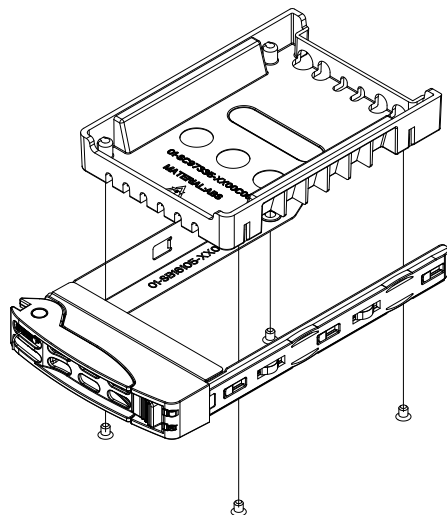


**Figure 3-12. Removing a Drive Carrier**

#### ***Mounting a Drive in 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. These screws are not used to mount the actual 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. Place the drive in the carrier so that the screw holes line up.
3. Secure the drive to the carrier with four M3 screws as illustrated below. These screws are included in the chassis accessory box.

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



**Figure 3-13. Removing a Dummy Drive from the Carrier**

**Note:** Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro website at <http://www.supermicro.com/products/nfo/files/storage/SBB-HDDCompList.pdf>

### ***Hot-Swap for NVMe Drives***

An NVMe drive can be inserted and replaced using IPMI.

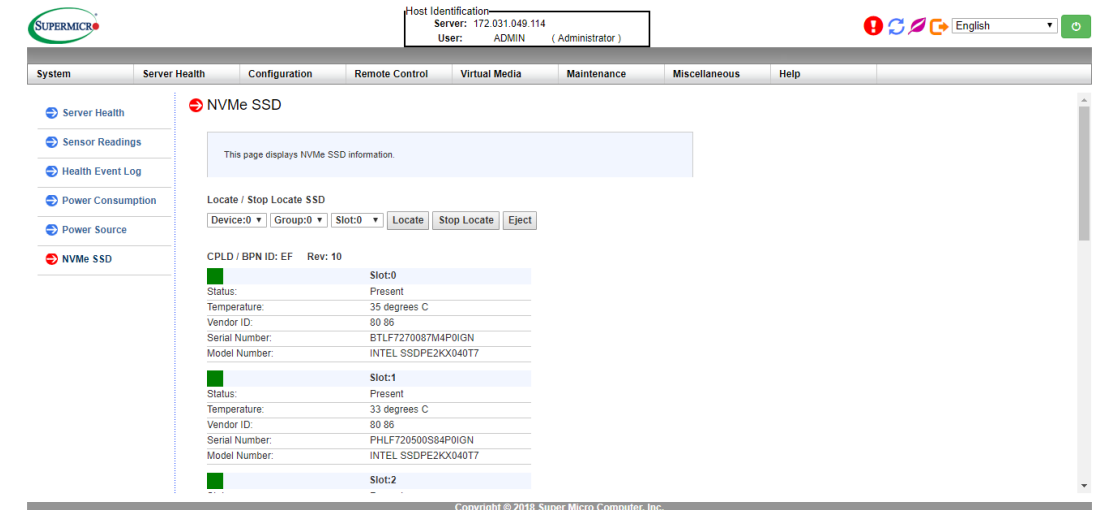
**Note:** If you are using VROC, see the VROC appendix in this manual instead.

#### ***Ejecting a Drive***

1. **IPMI > Server Health > NVMe SSD**
2. Select Device, Group and Slot, and click **Eject**. After ejecting, the drive Status LED indicator turns green.
3. Remove the drive.

Note that *Device* and *Group* are categorized by the CPLD design architecture. The SYS-1029UX-LL1-C16/LL2-C16/LL3-C16 server has one Device and one Group.

*Slot* is the slot number on which the NVMe drives are mounted.



**Figure 3-14. IPMI Screenshot**

### ***Replacing the Drive***

1. Insert the replacement drive.
2. **IPMI > Server Health > NVMe SSD**
3. Select Device, Group and slot and click **Insert**. The drive Status LED indicator flashes red, then turns off. The Activity LED turns blue.

### ***Checking the Temperature of an NVMe Drive***

There are two ways to check using IPMI.

#### ***Checking a Drive***

- **IPMI > Server Health > NVMe SSD** – Shows the temperatures of all NVMe drives, as in Figure 3-4.
- **IPMI > Server Health > Sensor Reading > NVME\_SSD** – Shows the single highest temperature among all the NVMe drives.

## System Cooling

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

### *Installing Fans*

Fan speed is controlled by system temperature via IPMI. 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).

### *Replacing a System Fan*

1. If necessary, open the chassis while the power is running to determine which fan requires changing. (Never run the server for an extended period of time with the chassis open.)
2. Power down the system as described in Section 3.1.
3. Next, remove the top chassis cover as described in Section 3.2.
4. Unplug the fan cable from the serverboard and remove the failed fan from the chassis.
5. Replace the failed fan with an identical 4cm fan, available from Supermicro.
6. Push the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.
7. Reposition the fan housing back over the two mounting posts in the system, then reconnect the fan wires to the same fan headers on the serverboard.
8. Power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the chassis cover.

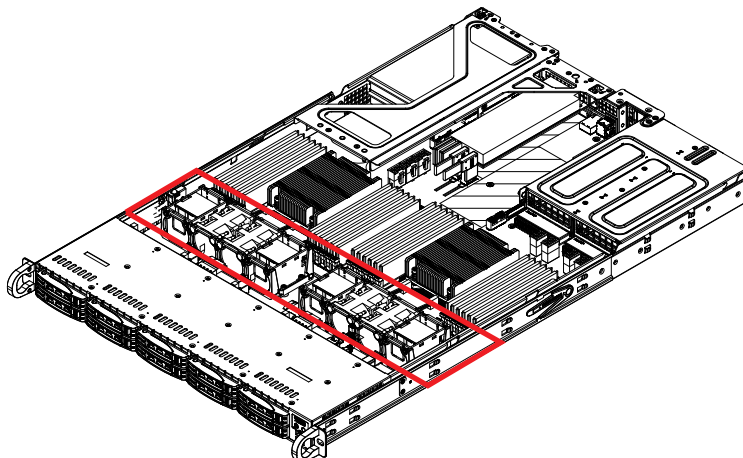


Figure 3-15. System Fans

## Installing the Air Shroud

Air shrouds concentrate airflow to maximize fan efficiency. The serverboard air shroud does not require screws to install.

### *Installing the Air Shroud*

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

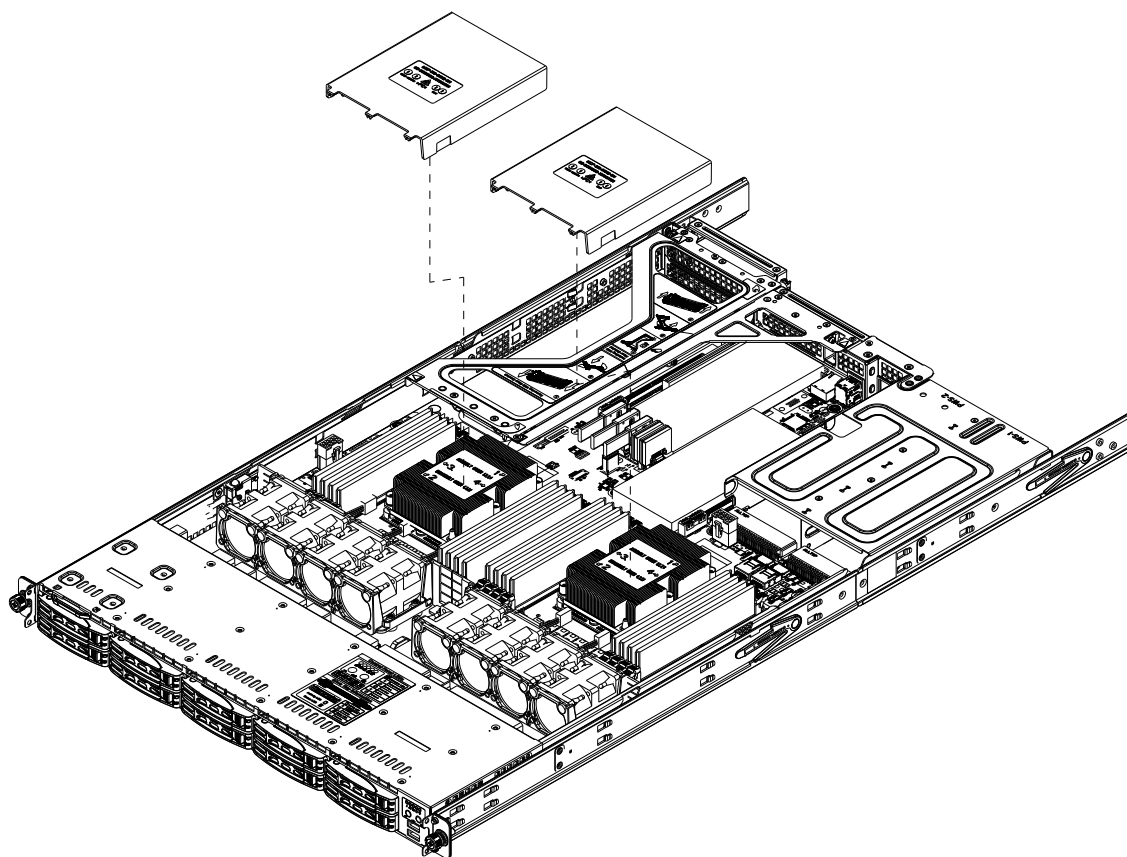


Figure 3-16. Installing the Air Shroud

## **Power Supply**

The SYS-1029UX-LL1-C16/LL2-C16/LL3-C16 has a redundant 750W power supply, consisting of two power supply modules. These power supplies are auto-switching capable, which enables it to automatically sense and operate with a 100V to 240V input voltage.

### ***Power Supply Failure***

If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption. The Power Fail LED will illuminate and remain on until the failed unit has been replaced. Replacement units can be ordered directly from Supermicro.

### ***Replacing the Power Supply***

Begin by removing power from the failed power supply.

1. Releasing the retention screws that secure the chassis to the rack, then grasp the two handles on either side and pull the system straight out until it locks (you will hear a "click").
2. Unplug the AC power cord from the failed power supply module.
3. Push in the locking tab at the back of the module to release it.
4. Pull the unit straight out of the chassis.
5. Insert the new unit into the chassis, pushing until it clicks.
6. Plug the AC power cord back into the module.

# 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 motherboard layout indicating component locations may be found in Chapter 1.

Please review the Safety Precautions in Appendix B before installing or removing components.

### 4.1 Power Connections

There are several different power connectors on the X11DPU-XLL as described below.

- SMCi-proprietary Power Connectors (PSU1/PSU2)
- 8-pin HDD Backplane Power Connectors (JPW1-JPW4)

#### PSU1 and PSU2 Power Connectors

Two SMCi-proprietary power supply units (PSU1/PSU2) are located on the motherboard to provide main power supply to your system. Power is connected to PSU1 and PSU2 automatically when the power supply modules are installed.

#### HDD Power Connectors

Four 8-pin HDD backplane power connectors (JPW1 - JPW4) are used to provide power to hard drives and other backplane devices. See the table below for pin definitions.

12V 8-pin Backplane Power Connector Pin Definitions	
Pin#	Definition
1 through 4	Ground
5/6	+12V
7/8	+5V

## GPU Power Connectors

Four power connectors for GPU and VGA devices are located at JGPW1, JGPW2, JGPW3 and JGPW4. Connect an appropriate cable to each GPU power connector to provide power for your GPU/VGA devices.

8-pin GPU Power Pin Definitions	
Pin#	Definition
1 through 4	Ground
5 through 8	+12V

## 4.2 Headers and Connectors

### Fan Headers

There are eight fan headers on the motherboard. These are 4-pin fan headers; pins 1-3 are backward compatible with traditional 3-pin fans. The onboard fan speeds are controlled by Thermal Management (via Hardware Monitoring) in the BIOS. When using Thermal Management setting, please use all 3-pin fans or all 4-pin fans.

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

### 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. See the table below for pin definitions.

Trusted Platform Module/Port 80 Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	+3.3V	2	SPI_CS#
3	RESET#	4	SPI_MISO
5	SPI_CLK	6	GND
7	SPI_MOSI	8	
9	+3.3V Stdby	10	SPI_IRQ#

### SATA DOM Power Connectors

Two power connectors for SATA DOM (Disk On Module) devices are located at JSD1 and JSD2. Connect appropriate cables to JSD1 and JSD2 to provide power for your SATA DOM devices.

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

### RAID Key Header

A RAID Key header is located at JRK1 on the motherboard.

### NVMe Slots

Use the four NVMe slots (NVME10, NVME11, NVME12 and NVME13) to attach high-speed PCI-E storage devices. (NVME10 and NVME11 controlled by CPU1, NVME12 and NVME13 controlled by CPU2.)

### SGPIO Header

The T-SGPIO3 (Serial General Purpose Input/Output) header is used to communicate with the enclosure management chip on the backplane.

SGPIO Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	NC	2	NC
3	Ground	4	Data out
5	Load	6	Ground
7	Clock	8	NC

NC = No Connection

### Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard. Attach the appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened. Refer to the table below for pin definitions.

Chassis Intrusion Pin Definitions	
Pins	Definition
1	Intrusion Input
2	Ground

### 4-pin BMC External I<sup>2</sup>C Header

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

External I <sup>2</sup> C Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

### NVMe I<sup>2</sup>C SMBus Headers

NVMe SMBus (I<sup>2</sup>C) headers (JNVI<sup>2</sup>C1 and JNVI<sup>2</sup>C2), used for PCI-E SMBus clock and data connections, provide hot-plug support via a dedicated SMBus interface. This feature is only available for a Supermicro complete system with an SMCI-proprietary NVMe add-on card and cable installed. See the table below for pin definitions.

NVMe SMBus Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	VCCIO

### I-SATA 3.0 and S-SATA 3.0 Ports

The X11DPU-XLL has eight I-SATA 3.0 ports (I-SATA0-3, I-SATA4-7) and six S-SATA ports (S-SATA0-3, S-SATA4, S-SATA5). These SATA ports are supported by the Intel C621 chipset. I-SATA0-3 are supported by the CPU2 PCI-E 3.0 x16 slot on SXB2 and S-SATA0-5 are supported by the CPU1 PCI-E 3.0 x8 slot on SXB1.

S-SATA4/S-SATA5 can be used with Supermicro SuperDOMs, which are orange SATA DOM connectors with power pins built in that do not require external power cables. Supermicro SuperDOMs are backward-compatible with regular SATA HDDs or SATA DOMs that need external power cables.

## Control Panel

JF1 contains header pins for various control panel connections. See the figure below for the pin locations and definitions of the control panel buttons and LED indicators.

All JF1 wires have been bundled into a single cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the motherboard. The other end connects to the control panel PCB board.

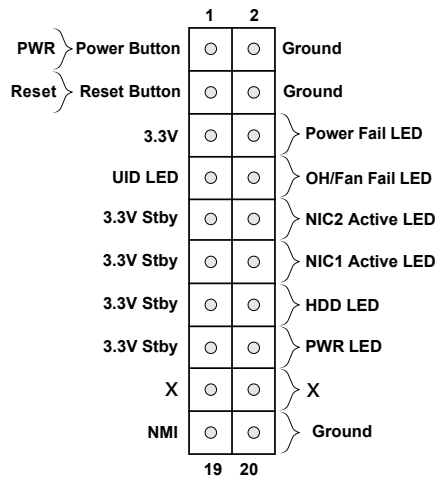


Figure 4-1. JF1: Control Panel Pins

### Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - see Chapter 4). To turn off the power when the system is in suspend mode, press the button for 4 seconds or longer. Refer to the table below for pin definitions.

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

### Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to a hardware reset switch on the computer case to reset the system. Refer to the table below for pin definitions.

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

### Power Fail LED

The Power Fail LED connection is located on pins 15 and 16 of JF1. Refer to the table below for pin definitions.

Power LED Pin Definitions (JF1)	
Pins	Definition
5	+3.3V
6	Power Fail Signal

### Fan Fail and UID LED

Connect an LED cable to pins 7 and 8 of the front control panel to use the Overheat/Fan Fail LED connections. The LED on pin 8 provides warnings of overheat or fan failure. Refer to the tables below for pin definitions.

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

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

### NIC1/NIC2 (LAN1/LAN2)

The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JF1, and the LED connection for LAN port 2 is on pins 9 and 10. Attach NIC LED cables to NIC1 and NIC2 LED indicators to display network activities. Refer to the table below for pin definitions.

LAN1/LAN2 LED Pin Definitions (JF1)	
Pins	Definition
9/11	+3.3V Stby
10/12	NIC Activity LED

### HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable to pin 14 to show hard drive activity status. Refer to the table below for pin definitions.

HDD LED Pin Definitions (JF1)	
Pins	Definition
13	3.3V Stby
14	HDD Active

## Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table below for pin definitions.

Power LED Pin Definitions (JF1)	
Pins	Definition
15	+3.3V
16	PWR LED

## NMI Button

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

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

## 4.3 Ports

### Rear I/O Ports

See the figure below for the locations and descriptions of the various I/O ports on the rear of the motherboard.

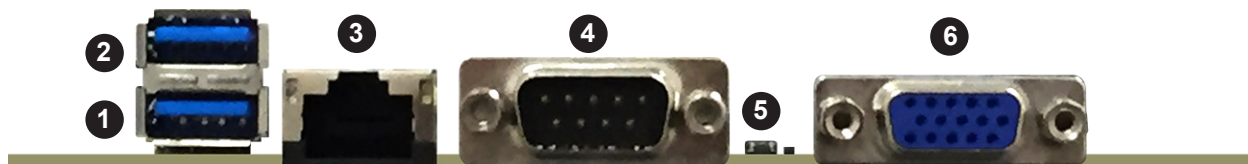


Figure 4-2. Rear I/O Ports

Rear I/O Ports			
No.	Description	No.	Description
1	USB0 (USB 3.0)	4	COM Port
2	USB1 (USB 3.0)	5	Unit Identifier Switch
3	Dedicated IPMI LAN Port	6	VGA Port

## VGA Port

The onboard VGA port is located next to IPMI LAN port on the I/O back panel. Use this connection for VGA display.

## Serial Port

The COM port (COM1) provides serial communication support.

Trusted Platform Module/Port 80 Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	N/A

## Universal Serial Bus (USB) Ports

There are two USB 3.0 ports (USB0/1) on the I/O back panel. There is also one USB 3.0 header (USB3/4) as well as a Type A USB 3.0 header (USB2) on the motherboard. 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

Front Panel USB 3/4 (3.0) Pin Definitions			
Pin#	Definition	Pin#	Definition
1	VBUS	19	Power
2	Stda_SSRX-	18	USB3_RN
3	Stda_SSRX+	17	USB3_RP
4	GND	16	GND
5	Stda_SSTX-	15	USB3_TN
6	Stda_SSTX+	14	USB3_TP
7	GND	13	GND
8	D-	12	USB_N
9	D+	11	USB_P
10		x	

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 Port

A dedicated IPMI GbE LAN port is located next to USB 0/1 ports on the back panel. This Ethernet port accepts RJ45 type cables. Please refer to the LED Indicator Section for LAN LED information..

## Unit Identifier Switch/UID LED Indicator

A Unit Identifier (UID) switch (JUIDB2) and a UID LED Indicator (LED1) are located on the I/O back panel. When you press the UID switch, the UID LED indicator will be turned on. Press the UID switch again to turn off the LED. The UID Indicator provides easy identification of a system unit that may be in need of service.

**Note:** UID can also be triggered via IPMI on the motherboard. For more information on IPMI, please refer to the IPMI User's Guide posted on our website at <http://www.supermicro.com>.

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

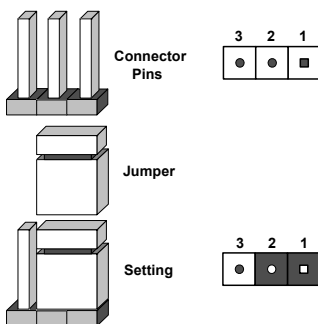
UID LED Pin Definitions	
Color	Status
Blue: On	Unit Identified

## 4.4 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.*



JBT1 contact pads

### VGA Enable/Disable

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

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

### Manufacturing Mode

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

### Management Engine (ME) Recovery

Use jumper JPME1 to select ME Firmware Recovery mode, which will limit resource allocation for essential system operation only in order to maintain normal power operation and management. In the single operation mode, online upgrade will be available via Recovery mode. See the table below for jumper settings.

Manufacturer Mode Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal
Pins 2-3	ME Recovery

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

Jumper JVRM1 allows the BMC or the PCH to access CPU and memory VRM controllers. See the table below for jumper settings.

VRM Jumper Settings	
Jumper Setting	Definition
Pins 1-2	BMC (Normal)
Pins 2-3	PCH

## Watch Dog

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

The default setting is Reset.

**Note:** When Watch Dog is enabled, the user needs to write their own application software to disable it.

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

## 4.5 LED Indicators

### BMC Heartbeat LED

LED1 is the BMC heartbeat LED. When the LED is blinking green, BMC is functioning normally. See the table below for the LED status.

Onboard Power LED Indicator	
LED Color	Definition
Green: Blinking	BMC Normal

### Unit ID LED

A rear UID LED indicator at UID\_LED1 is located near the UID switch on the back panel. This UID indicator provides easy identification of a system unit that may need service.

UID LED LED Indicator	
LED Color	Definition
Blue: On	Unit Identified

### IPMI LAN LEDs

The dedicated IPMI LAN has two LED indicators. The amber LED on the right indicates activity, while the LED on the left indicates the speed of the connection. See the table below for more information.

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

### Onboard Power LED

The Onboard Power LED is located at LE2 on the motherboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. Refer to the table below for more information.

Onboard Power LED Indicator	
LED Color	Definition
Off	System Off (power cable not connected)
Green	System On

# 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.supernmicro.com/support/manuals](http://www.supernmicro.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 a USB flash or media 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 clicking **F11** during the system startup.

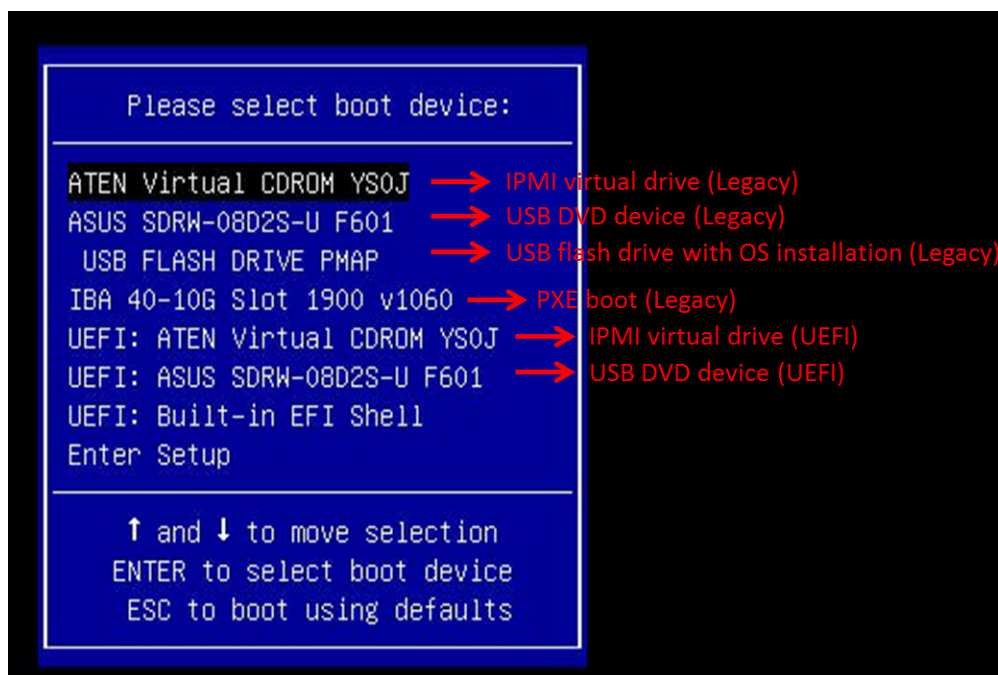
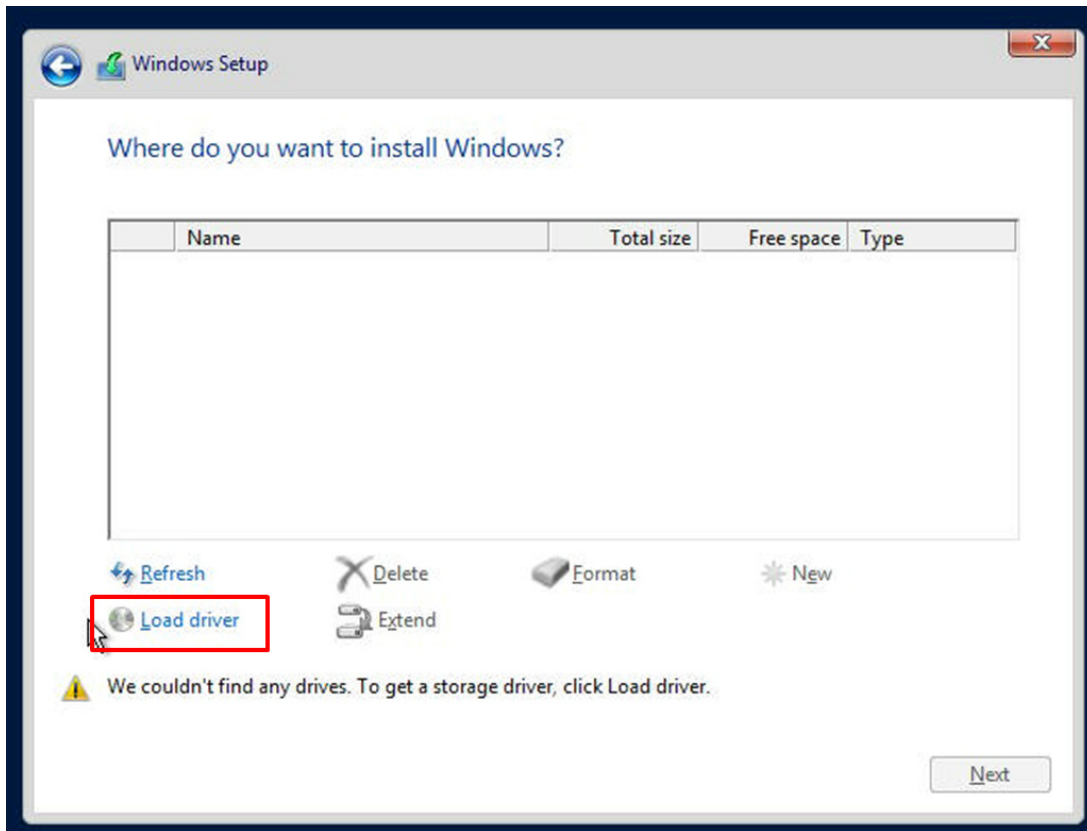


Figure 5-1. Select Boot Device

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.

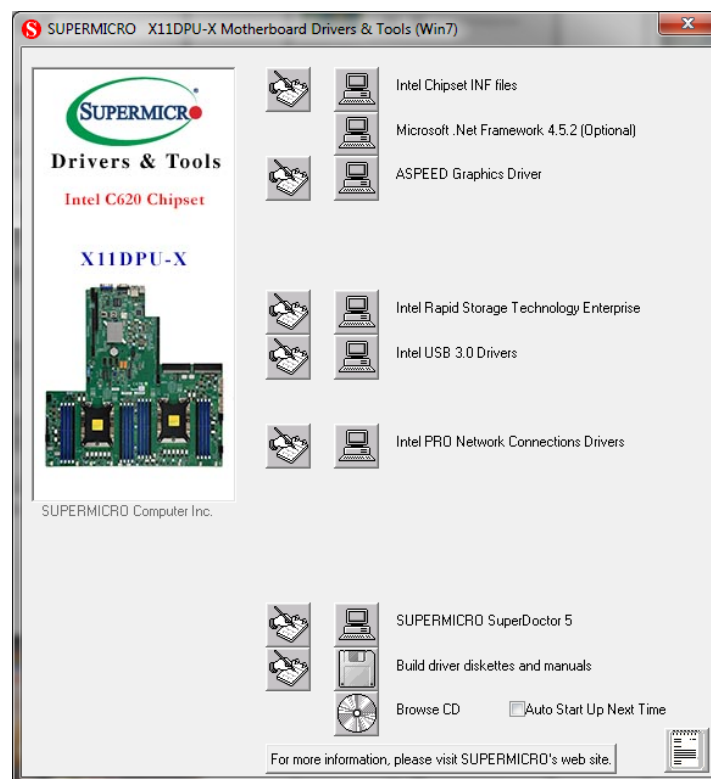
## 5.2 Driver Installation

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 media drive. (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.

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

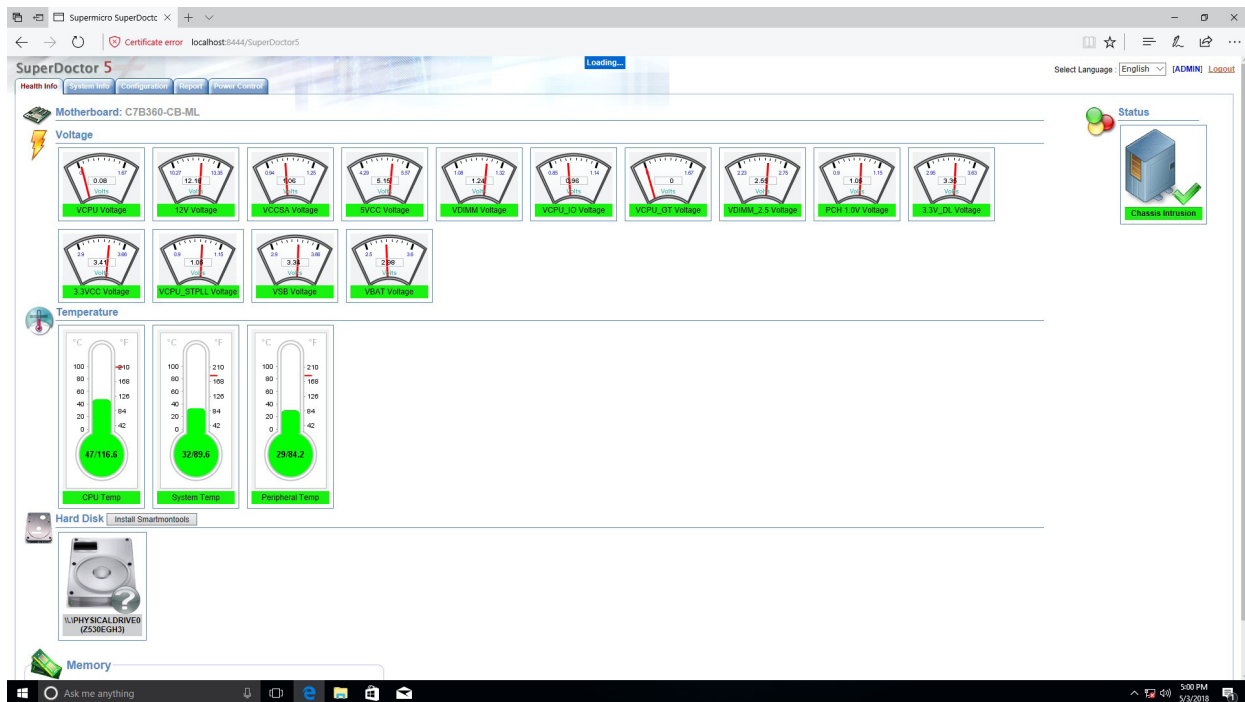


Figure 5-4. SuperDoctor 5 Interface Display Screen (Health Information)

## 5.4 IPMI

The X11DPU-XLL 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.

For general documentation and information on IPMI, please visit our website at: <http://www.supermicro.com/products/nfo/IPMI.cfm>.

# Chapter 6

## UEFI BIOS

### 6.1 Introduction

This chapter describes the AMIBIOS™ setup utility for the X11DPU-XLL motherboard. The BIOS is stored on a chip and can be easily upgraded using a flash program.

**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 the BIOS that may not be reflected in this manual.

#### Starting the Setup Utility

To enter the BIOS setup utility, press 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>. 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.

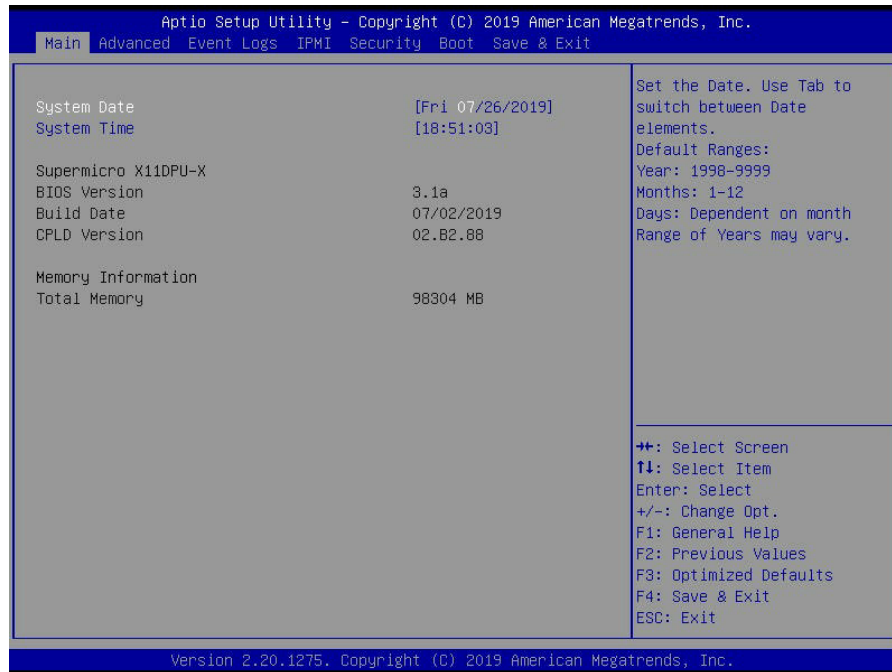
A "▶" indicates a submenu. Highlighting such an item and pressing the <Enter> key will open the list of settings within that submenu.

The BIOS setup utility uses a key-based navigation system called hot keys. Most of these hot keys (<F1>, <F2>, <F3>, <F4>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.

**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.

## 6.2 Main Setup

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



### System Date/System Time

Use this item to change the system date and time. Highlight *System Date* or *System Time* using the arrow keys. Enter new values using the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in 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 the BIOS build date after the RTC (Real Time Clock) reset.

### Supermicro X11DPU-XLL

#### BIOS Version

This feature displays the version of the BIOS ROM used in the system.

#### Build Date

This feature displays the date when the version of the BIOS ROM used in the system was built.

#### CPLD Version

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

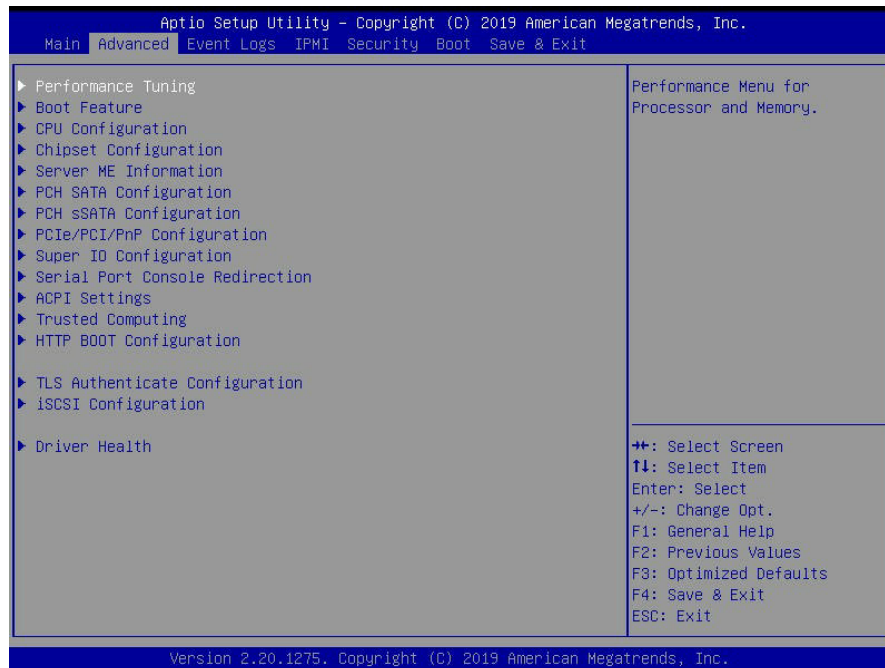
## **Memory Information**

### **Total Memory**

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

## 6.3 Advanced Setup Configurations

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 improper DRAM frequency, or a wrong BIOS timing setting may cause the system to malfunction. When this occurs, restore the setting to the manufacturer default setting.

### ▶ Performance Tuning

#### Core Enabled

Use this feature to enable or disable CPU cores in the processor specified by the user. Use the <+> key and the <-> key on the keyboard to set the desired number of CPU cores you want to enable in a processor. Please note that the maximum of 8 CPU cores are currently available in each CPU package. The default setting is **0**.

#### Hyper-Speed

Use this option to enable Hyper-Speed feature. The options are **Enabled** and Disabled

#### Hyper-Turbo

Use this option to enable Hyper-Turbo feature. The options are **Enabled** and Disabled

#### VOUT (Output Voltage)

Use this feature to select the output voltage specified by the user. If this value is set to 0, the output voltage will be controlled by the SVID bus. If this value is set to non-zero, the output voltage will be controlled by the PMBus. The default option is **0**.

## ► 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 settings. Select Force BIOS to use the Option ROM 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 Num Lock 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 feature is set to Immediate, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at bootup immediately and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Postponed, the ROM BIOS of the host adaptors will not capture Interrupt 19 immediately to allow the drives attached to these adaptors to function as bootable devices at bootup. The options are **Immediate** and Postponed.

### Re-try Boot

When EFI (Extensible 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**.

## ►CPU Configuration

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

### ►Processor Configuration

The following CPU information will display:

- 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**.

### **Monitor/Mwait**

Select Enable to enable the Monitor/Mwait instructions in the processor. The options are **Auto**, Enable and Disable.

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

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

### **Intel Virtualization Technology (Available when two processors are installed on the motherboard)**

Select Enable to use Intel Virtualization Technology which will allow multiple workloads to share the same set of common resources. On shared virtualized hardware, various workloads (or tasks) can co-exist, sharing the same resources, while functioning in full independence from each other, and migrating freely across multi-level infrastructures and scale as needed. 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 Lock/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**.

### **DCU 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 to enhance CPU performance. The options are Disable and **Enable**.

### **DCU IP Prefetcher**

This feature allows the system to use the sequential load history, which is based on the instruction pointer of previous loads, to determine whether the system will prefetch additional lines. 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. The options are **BIOS Controls EPB** and OS Controls EPB.

### **ENERGY\_PERF\_BIAS\_CFG mode (ENERGY PERFORMANCE BIAS CONFIGURATION Mode) (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 Extreme Performance, **Maximum Performance**, Performance, Balanced Performance, Balanced Power, and Power.

## ►CPU P State Control (Available when "Power Technology" is set to Custom)

### SpeedStep (P-States)

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 feature 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 (Available when "Power Technology" is set to Custom)

### 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 **Disable** and **Enable**.

### CPU C6 report (Available when Autonomous Core C-State is set to Disable)

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) (Available when Autonomous Core C-State is set to Disable)**

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

Use this feature to set the limit on the C-State package register. The options are **C0/C1 state**, C2 state, C6 (non-Retention) state, C6 (Retention) state, No Limit, and Auto.

**► CPU T State Control (Available when "Power Technology" is set to Custom)****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 **Enable** and Disable.

**► Chipset Configuration**

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

**► North Bridge**

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

**► UPI (Ultra Path Interconnect) 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 (UPI) 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 (InvlToM) 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 InvltoM Hybrid Push, InvltoM AllocFlow, Enable for Remote InvltoM Hybrid AllocNonAlloc, and Enable for Remote InvltoM and Remote WCiLF.

### SNC

Select Enable to use "Sub NUMA Clustering" (SNC), which supports full SNC (2-cluster) interleave and 1-way IMC interleave. 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 to support XPT Prefetching to enhance system performance. The options are Enable and **Disable**.

### KTI Prefetch

Select Enable to support KTI Prefetching to enhance system performance. The options are **Enable** and Disable.

### Local/Remote Threshold

This feature allows the user to set the threshold for the Interrupt Request (IRQ) signal, which handles hardware interruptions. The options are Disable, **Auto**, Low, Medium, and High.

### Stale AtoS (A to S)

The in-memory directory has three states: I, A, and S states. The I (-invalid) state indicates that the data is clean and does not exist in the cache of any other sockets. The A (-snoop All) state indicates that the data may exist in another socket in an exclusive or modified state. The S state (-Shared) indicates that the data is clean and may be shared in the

caches across one or more sockets. When the system is performing "read" on the memory and if the directory line is in A state, we must snoop all other sockets because another socket may have the line in a modified state. If this is the case, a "snoop" will return the modified data. However, it may be the case that a line "reads" in an A state, and all the snoops come back with a "miss". This can happen if another socket reads the line earlier and then has silently dropped it from its cache without modifying it. If the "Stale AtoS" feature is enabled, a line will transition to the S state when the line in the A state returns only snoop misses. That way, subsequent reads to the line will encounter it in the S state and will not have to snoop, saving the latency and snoop bandwidth. Stale "AtoS" may be beneficial in a workload where there are many cross-socket reads. The options are Disable, Enable, and **Auto**.

#### **LLC Dead Line Alloc**

Select Enable to opportunistically fill the deadlines in the LLC. 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 (Plan of Record)**

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

#### **PPR Type**

Post Package Repair (PPR) is a new feature available for the DDR4 Technology. PPR provides additional spare capacity within a DDR4 DRAM module that is used to replace faulty cell areas detected during system boot. PPR offers two types of memory repairs. Soft Post Package Repair (sPPR) provides a quick, temporary fix on a raw element in a bank group of a DDR4 DRAM device, while hard Post Package Repair (hPPR) will take a longer time to provide a permanent repair on a raw element. The options are **Auto**, Hard PPR, Soft PPR, and PPR Disable.

#### **Memory Frequency**

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 1866, 2000, 2133, 2400, 2666, and 2933\*. (**\*Note:** Support for 2933 MHz memory is dependent on the CPU SKU.)

### **Data Scrambling for DDR4**

Select Enable to enable data scrambling for DDR4 memory to enhance system performance and security. Select Auto for the default setting of the Memory Reference Code (MRC) to set configure data scrambling for DDR4 setting. The options are **Auto**, Disable, and Enable.

### **tCCD\_L Relaxation**

If this feature is set to Enable, 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 **Auto** and Disable.

### **tRWSR (Read to Write turnaround time for Same Rank) Relaxation**

Select Enable to use the same tRWSR DDR timing setting among all memory channels, and in which case, the worst case value among all channels will be used. Select Disable to use different values for the tRWSR DDR timing settings for different channels as trained. The options are **Disable**, and Enable.

### **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 Interleave, 2-way Interleave, and **Auto**.

### **Turn off Memory Error LED**

Use this feature to turn off the Memory Error LED, or reset it during the next reset. The options are **Do Nothing** and Yes, Next reset.

## **►Memory Topology**

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

- P1 DIMMA1/DIMMA2/DIMMB1/DIMMC1/DIMMD1/DIMMD2/DIMME1/DIMMF1
- P2 DIMMA1/DIMMA2/DIMMB1/DIMMC1/DIMMD1/DIMMD2/DIMME1/DIMMF1

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

Use this submenu to configure the following Memory RAS settings.

### Static Virtual Lockstep Mode

Select Enable to support 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.

### 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 set to Mirror Mode 1LM or a DCPMM is plugged in.

### Correctable Error Threshold

Use this feature to enter the threshold value for correctable memory errors. The default setting is **512**.

### Intel Run Sure

Select Enable to use Intel Run Sure Technology which will enhance critical data protection and increase system uptime and resiliency. The options are Enable and **Disable**.

### ADDDC (Adaptive Double Device Data Correction) Sparing (Available when Intel Run Sure is set to Disable)

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.

### 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 feature 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 (Available when Patrol Scrub is set to Enable)**

Use this feature 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**.

**► 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)**

Use this feature to configure 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)**

Use this feature to configure 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)**

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

**► 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 "TLP 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 (Access Control Services) Control

Select Enable to program Access Control Services to Chipset PCI-E Root Port Bridges. Select Disable to program Access Control Services to all 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-Isoch 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-Isoch 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-Isoch)

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

## ► Intel® VMD Technology

Use this feature to configure Intel Volume Management Device (VMD) Technology settings.

**Note:** After you've enabled VMD on a PCI-E slot of your choice, this PCI-E slot will be dedicated for VMD use only, and it will no longer support any PCI-E device. To reactivate this slot for PCI-E use, please disable VMD.

► **Intel® VMD for Volume Management Device on CPU1 - Intel® VMD for Volume Management Device on CPU4**

**VMD Configuration for PStack0 - VMD Configuration for PStack2**

**Intel®VMD for Volume Management Device for PStack0 - PStack2**

Select Enable to enable Intel Volume Management Device Technology support for the device specified by the user. The options are Disable and Enable.

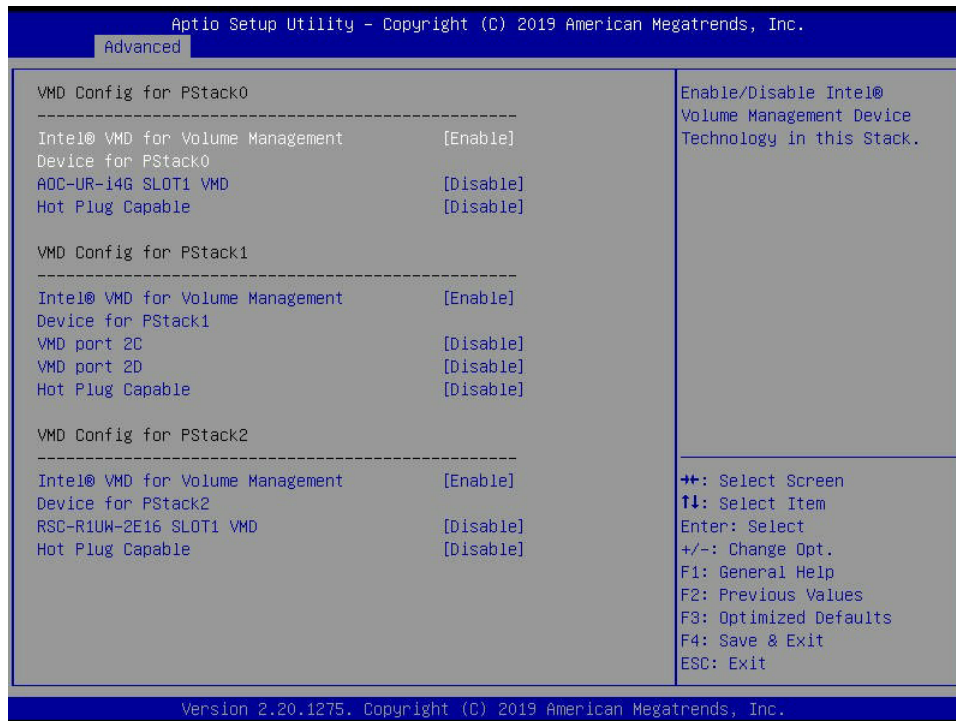
*\*If Intel® VMD for Volume Management Device for PStack0 is set to Enable, the following item will display.*

**AOC-UR-i4G SLOT 1 VMD**

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

**Hot Plug Capable**

Select Enable to enable Hot Plug support for the root ports specified by the user, which will allow the user to change the devices on those root ports without shutting down the system. The options are **Disable** and Enable.



*\*If Intel® VMD for Volume Management Device for PStack1 is set to Enable, the following item will display.*

#### **VMD Port 2C**

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

#### **VMD Port 2D**

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

#### **Hot Plug Capable**

Select Enable to enable Hot Plug support for the root ports specified by the user, which will allow the user to change the devices on those root ports without shutting down the system. The options are **Disable** and Enable.

*\*If Intel® VMD for Volume Management Device for PStack2 is set to Enable, the following item will display.*

#### **RSC-R1UW-2E16 SLOT 1 VMD**

Select Enable to enable Intel Volume Management Device Technology support for the PCI-E slot specified by the user. The options are Enable and the **Disable**.

#### **Hot Plug Capable**

Select Enable to enable Hot Plug support for the root ports specified by the user, which will allow the user to change the devices on those root ports without shutting down the system. The options are **Disable** and Enable.

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

#### **VMD Configuration for PStack0/VMD Configuration for PStack1/VMD Configuration for PStack2**

#### **Intel® VMD for Volume Management Device for PStack0/Intel® VMD for Volume Management Device for PStack1/Intel® VMD for Volume Management Device for PStack2**

Select Enable to enable Intel Volume Management Device Technology support for the root port specified by the user. The options are Enable and **Disable**.

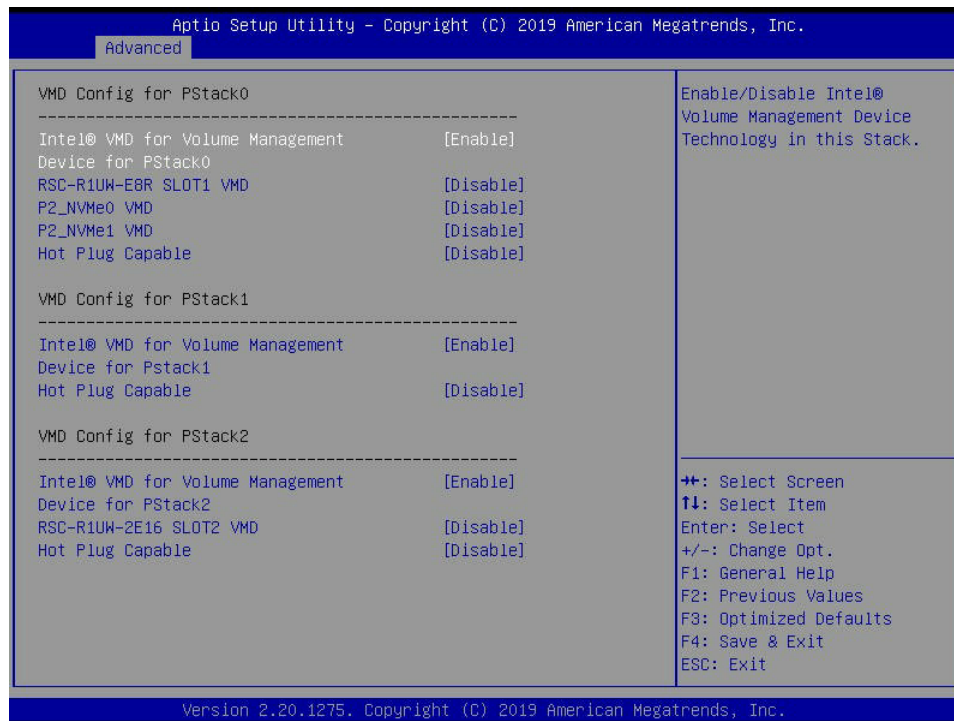
*\*If Intel® VMD for Volume Management Device for PStack0 is set to Enable, the following item will display.*

#### **RSC-R1UW-E8R SLOT1 VMD**

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

#### **P2\_NVMe0 VMD**

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



### P2\_NVMe1 VMD

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

### Hot Plug Capable

Select Enable to enable Hot Plug support for the root ports specified by the user, which will allow the user to change the devices on those root ports without shutting down the system. The options are **Disable** and Enable.

*\*If Intel® VMD for Volume Management Device for PStack1 is set to Enable, the following item will display.*

### Hot Plug Capable

Select Enable to enable Hot Plug support for the root ports specified by the user, which will allow the user to change the devices on those root ports without shutting down the system. The options are **Disable** and Enable.

*\*If Intel® VMD for Volume Management Device for PStack2 is set to Enable, the following item will display.*

### RSC-R1UW-2E16 SLOT2 VMD

Select Enable to enable Intel Volume Management Device Technology support for the PCI-E slot specified by the user. The options are Enable and the **Disable**.

### Hot Plug Capable

Select Enable to enable Hot Plug support for the root ports specified by the user, which will allow the user to change the devices on those root ports without shutting down the system. The options are **Disable** and Enable.

## ► IIO-PCIE Express Global Options

### IIO-PCIE Express Global Options

The section allows the user to configure the following PCI-E global options:

#### PCI-E Completion Timeout (Global) Disable

Use this feature to select the PCI-E Completion Time-out settings. 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 Disabled and **Enabled**.

### 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.

### PCIe PLL SSC

Select Enabled 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 Enabled and **Disabled**.

## ► **Server ME (Management Engine) Configuration**

This feature displays the following system ME configuration settings.

- General ME Configuration
- Oper. (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 Intel PCH and displays the following items:

### **SATA Controller**

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

### **Configure SATA as (Available when SATA Controller is set to Enable)**

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.

### **SATA HDD Unlock (Available when SATA Controller is set to Enable)**

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

### **SATA RSTe Boot info (Available when Configure SATA as is set to RAID)**

When this feature is set to Enable, the SATA Controller provides full int 13h support for SATA controller attached devices. CSM storage OPRM policy should be set to legacy to make this selection effective. The default options are Disable and **Enable**.

### **Aggressive Link Power Management**

When this feature is set to Enable, 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 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**.

**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**

When this feature is set to Enable, the SATA device installed on the SATA port specified by the user will start a COMRESET initialization when an edge is detected from 0 to 1. The options are Enable and **Disable**.

**SATA Device Type**

Use this feature to specify if the device installed on the SATA 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.

**►PCH sSATA Configuration**

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

**sSATA Controller**

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

**Configure sSATA as (Available when sSATA Controller is set to Enable)**

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.

**SATA HDD Unlock (Available when sSATA Controller is set to Enable)**

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

**SATA RSTe Boot info (Available when Configure SATA as is set to RAID)**

When this feature is set to Enable, the SATA Controller provides full int 13h support for SATA controller attached devices. CSM storage OPRM policy should be set to legacy to make this selection effective. The default options are Disable and **Enable**.

### **Aggressive Link Power Management**

When this feature is set to Enable, the sSATA AHCI controller manages the power use of the sSATA 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 Configure sSATA 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 specified by the user, which will allow the user to replace the device installed in the slot without shutting down the system. The options are **Enable** and Disabled.

##### **Spin Up Device**

This setting allows the SATA device installed on the SATA port specified by the user to start a COMRESET initialization when an edge is detected from 0 to 1. The options are Enable and **Disable**.

##### **sSATA Device Type**

Use this feature 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**

**Note:** PCIe/PCI/PnP Configuration settings may differ depending on the PCI-E devices installed on the motherboard.

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, 2T 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 how the lowest MMCFG (Memory-Mapped Configuration) base is assigned to onboard PCI devices. The options are 1G, 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**

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

**SLOT1 PCI-E 3.0 x8 (IN x16) OPROM**

Select EFI to allow the user to boot the computer using an EFI (Extensible Firmware Interface) device installed on the M.2 slot specified by the user. Select Legacy to allow the user to boot the computer using a legacy device installed on the M.2 slot specified by the user. The options are Disabled, **Legacy** and EFI.

**SLOT2 PCI-E 3.0 x16 OPROM**

Select EFI to allow the user to boot the computer using an EFI (Extensible Firmware Interface) device installed on the M.2 slot specified by the user. Select Legacy to allow the user to boot the computer using a legacy device installed on the M.2 slot specified by the user. The options are Disabled, **Legacy** and EFI.

### **SLOT3 PCI-E 3.0 x8 OPROM**

Select EFI to allow the user to boot the computer using an EFI (Extensible Firmware Interface) device installed on the M.2 slot specified by the user. Select Legacy to allow the user to boot the computer using a legacy device installed on the M.2 slot specified by the user. The options are Disabled, **Legacy** and EFI.

### **SLOT1 PCI-E x16 OPROM**

Select EFI to allow the user to boot the computer using an EFI (Extensible Firmware Interface) device installed on the M.2 slot specified by the user. Select Legacy to allow the user to boot the computer using a legacy device installed on the M.2 slot specified by the user. The options are Disabled, **Legacy** and EFI.

### **SLOT2 PCI-E x16 OPROM**

Select EFI to allow the user to boot the computer using an EFI (Extensible Firmware Interface) device installed on the M.2 slot specified by the user. Select Legacy to allow the user to boot the computer using a legacy device installed on the M.2 slot specified by the user. The options are Disabled, **Legacy** and EFI.

### **Bus Master Enable**

If this setting is set to Enabled, the PCI Bus Driver will enable the Bus Master Attribute for DMA transactions. If this setting is set to Disabled, the PCI Bus Driver will disable the Bus Master Attribute for Pre-Boot DMA protection. The options are Disabled and **Enabled**.

### **Onboard LAN1 Option ROM**

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

### **Onboard LAN2~4 Option ROM**

Use this feature to select the type of device installed in LAN Port2~4, which will be used for system boot. The options are PXE and **Disabled**.

### **Onboard NVMe1~4 Option ROM**

Select EFI to allow the user to boot the computer using an EFI (Extensible Firmware Interface) device installed on the NVME connector specified by the user. Select Legacy to allow the user to boot the computer using a legacy device installed on the NVME connector specified by the user. The options are Disabled, Legacy and **EFI**.

### **Onboard Video OPROM (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 Serial Port 1. The options are **Enabled** and Disabled.

### **Device Settings (Available when the item above "Serial Port (1)" is set to Enabled)**

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

#### **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=2F8h; IRQ=4), (IO=3E8h; IRQ=4) and (IO=2E8h; IRQ=4).

## **►Serial Port 2 Configuration**

### **Serial Port 2**

Select Enabled to enable Serial Port 2. The options are **Enabled** and Disabled.

### **Device Settings (Available when the item above "Serial Port (2)" is set to Enabled)**

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

#### **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), (IO=3E8h; IRQ=3) and (IO=2E8h; IRQ=3).

### **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 (for COM 1)

### 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)/COM2**

### **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)**

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, 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.

## **► Legacy Console Redirection**

### **Legacy Serial Redirection Port**

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

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

The feature 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 specified by the user for EMS Console Redirection. The options are Enabled and **Disabled**.

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

## **► Console Redirection Settings (for EMS)**

### **Out-of-Band Mgmt(Management) Port**

This 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 (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 installed and detected by the BIOS)

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

- TPM2.0 Device Found
- Firmware Version
- Vendor

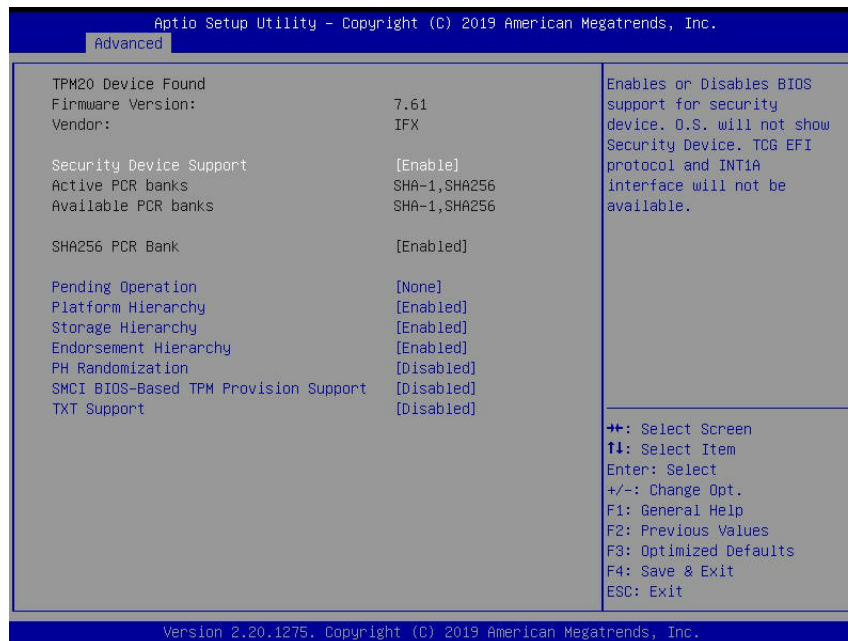
### Security Device Support

If this feature and the TPM jumper (JPT1) on the motherboard 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 made 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

### Disable Block SID

Select Enabled to allow SID authentication be performed in TCG Storage devices. The options are **Enabled** and Disabled.



### **SHA256 PCR Bank**

Select Enabled to enable SHA256 PCR Bank support to enhance system security and data integrity. The options are **Enabled** and Disabled.

### **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. These early boot codes are shipped with the platform and are included in the list of "public keys". During system boot, the platform firmware uses the trusted public keys 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.

### **SMCI BIOS-Based TPM Provision Support**

Use feature to enable the Supermicro TPM Provision support. The default option is **Disabled** if SMCI BIOS-Based TPM Provision Support item is "Official"; the default option is **Enabled** if SMCI BIOS-Based TPM Provision Support item is "Beta".

### **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>.

## **► HTTP BOOT Configuration**

When this submenu is selected, the following items will be displayed:

### **Http Boot One Time**

Select Enabled to enable HTTP Boot. The options are Enabled and **Disabled**. After creating the Http Boot Option, it will auto boot into Http Boot for the first time.

### **Input the description**

This feature allows the user to insert a description for the HTTP Boot option.

### **Boot URI**

This feature allows the user to enter a URI to create a new Boot option.

## ▶ TLS Authenticate Configuration

When this submenu is selected, the following items will be displayed:

### ▶ Server CA Configuration

This feature allows the user to configure the client certificate that is to be used by the server.

#### ▶ Enroll Certification

This feature allows the user to enroll the certificate in the system.

##### ▶ Enroll Cert (Certification) Using File

This feature allows the user to enroll the security certificate in the system by using a file.

##### Cert (Certification) GUID (Global Unique Identifier)

This feature displays the GUID for this system.

##### ▶ Commit Changes and Exit

Select this feature to keep the changes you have made and exit from the system.

##### ▶ Discard Changes and Exit

Select this feature to discard the changes you have made and exit from the system.

#### ▶ Delete Certification

If this feature is set to Enable, the certificate enrolled in the system will be deleted. The options are Enable and **Disable**.

## ▶ iSCSI Configuration

This submenu displays iSCSI configuration information:

### iSCSI Initiator Name

Use this item to enter the name of the iSCSI Initiator, which is a unique name used in the world. The name must be in the IQN format.

The following submenu will be available for configuration:

▶ **Add an Attempt**

▶ **Delete Attempts**

▶ **Change Attempt Order**

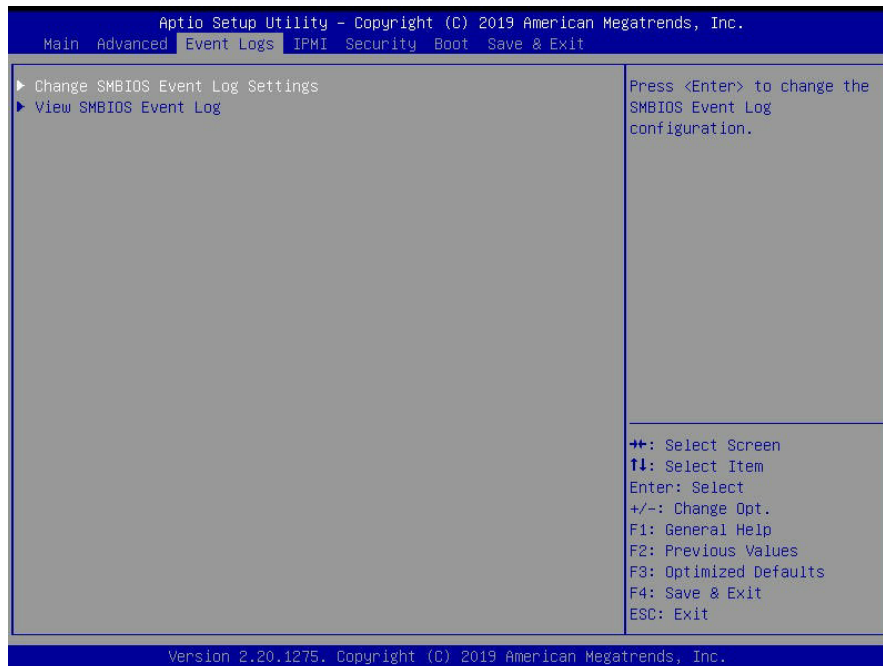
▶ **Driver Health**

This submenu displays health status of the drivers/controllers installed in the system.

## 6.4 Event Logs

Use this feature to configure Event Log settings.

**Note:** After you've made a change on a setting below, please be sure to reboot the system for the change to take effect.



### ► 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 "No" to keep the event log without erasing it upon next system bootup. Select "Yes, Next Reset" to erase the event log upon next system reboot. The options are **"No"**, "Yes, Next reset", and "Yes, Every reset".

#### When Log is Full

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

## **SMBIOS Event Log Standard Settings**

### **Log System Boot Event**

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

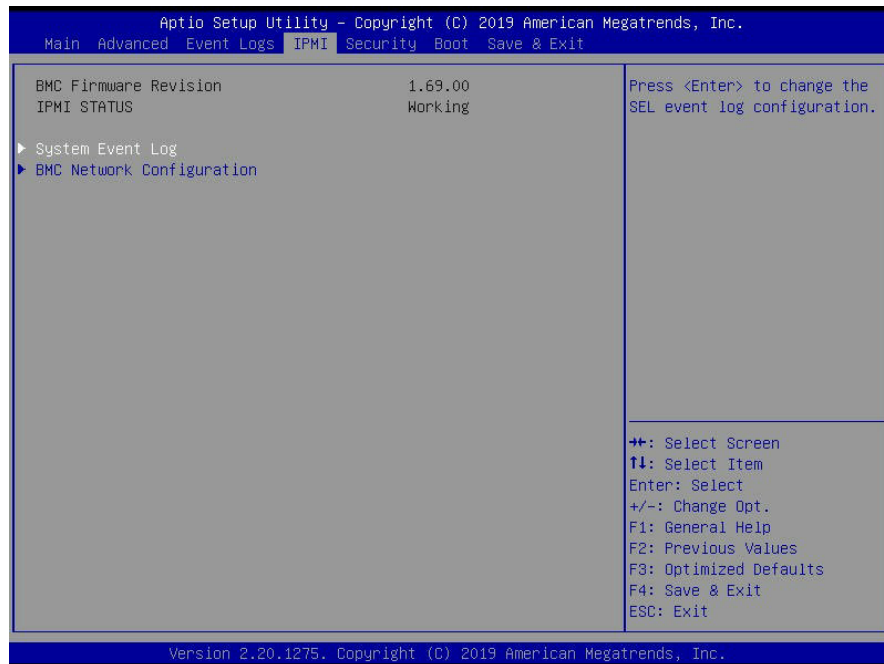
This feature is used to determine how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number between 0 to 99. The default setting is **60**.

### **►View SMBIOS Event Log**

This feature allows the user to view the event in the system event log. Select this item 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 IPMI firmware revision used in your system.
- **IPMI STATUS:** This feature indicates the status of the BMC (Baseboard Management Controller) installed in your system.

### ► System Event Log

#### Enabling/Disabling Options

##### SEL Components

Select Enabled to enable all system event logging upon system boot. The options are **Enabled** and Disabled.

#### Erasing Settings

##### Erase SEL

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

### When SEL is Full

This feature allows the user to determine what the 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.

### ►BMC Network Configuration

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 feature displays the IPMI Network Link status. The default setting is **Dedicated LAN**.
- 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: This feature displays the status of VLAN support. The default setting is **Disabled**.
- IPv6 Address Status: This feature displays the IPv6 address status. The default setting is **Disabled**.
- Station IPv6 Address: This feature displays the station IPv6 address.
- Prefix Length: This item displays the prefix length.
- IPv6 Router IP Address: This feature displays the IPv6 router IP address.

### Update IPMI LAN Configuration

Select Yes for the BIOS to implement all IP/MAC address changes upon next system boot. The options are **No** and Yes. If this option is set to Yes, the following items will be available:

**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.

**VLAN**

Select Enabled to enable IPMI VLAN function support. The default setting is **Disabled**.

**IPv6 Support**

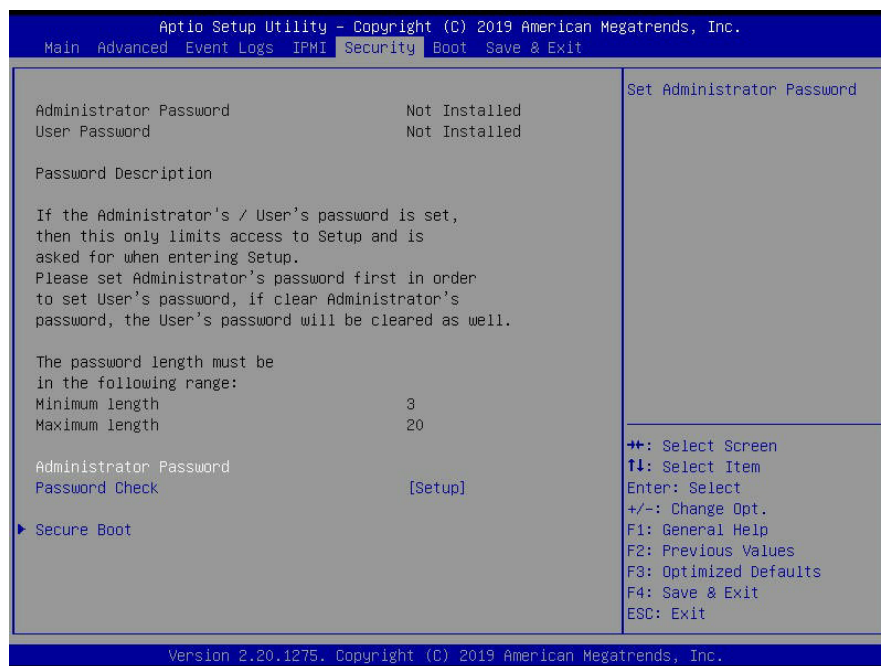
Select Enabled for IPv6 support. The options are **Enabled**, and Disabled. If this option is set to Enabled, the following item will display:

**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

## 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 system boot and 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
- Vendor Keys
- Secure Boot

### Secure Boot

Select Enabled to use Secure Boot settings. 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**.

### CMS Support

If this feature is set to Enabled, legacy devices will be supported by the system. The options are **Enabled** and Disabled.

## ►Key Management

### Vendor Keys

#### Provision Factory Defaults

Select Yes to install manufacturer default keys for system security use. The options are Enabled and **Disabled**.

#### ►Restore Factory Keys

Select Yes to restore all manufacturer default keys for system security use. The options are **Yes** and No.

#### ►Reset to Setup Mode

This feature resets the system to Setup Mode.

#### ►Export Secure Boot Variables

This feature is used to copy the NVRAM content of Secure Boot variables to a storage device.

#### ►Enroll EFI Image

Select this feature and press <Enter> to specify an EFI (Extensible Firmware Interface) image for the system to use when it operates in the Secure Boot mode.

## Device Guard Ready

### ▶Remove 'UEFI CA' from DB

Select Yes to remove UEFI CA from the database. The options are **Yes** and No.

### ▶Restore DB defaults

Select Yes to restore database variables to the manufacturer default settings. The options are **Yes** and No.

## Secure Boot Variable/Size/Keys/Key Source

### ▶Platform Key (PK)

This feature allows the user to enter and configure a set of values to be used as platform firmware keys for the system. The sizes, keys numbers, and key sources of the platform keys will be indicated as well. Select Update to update the platform key.

### ▶Key Exchange Keys

This feature allows the user to enter and configure a set of values to be used as Key-Exchange-Keys for the system. The sizes, keys numbers, and key sources of the Key-Exchange-Keys will be indicated as well. Select Update to update your "Key Exchange Keys". Select Append to append your "Key Exchange Keys".

### ▶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 sizes, keys numbers, and the sources of the authorized signatures. Select Update to update your "Authorized Signatures". Select Append to append your "Authorized Signatures". The settings are Update, and Append.

### ▶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 sizes, keys numbers, and key sources of the forbidden signatures. Select Update to update your "Forbidden Signatures". Select Append to append your "Forbidden Signatures". The settings are Update, and Append.

### ▶Authorized TimeStamps

This feature allows the user to set and save the timestamps for the authorized signatures which will indicate the time when these signatures are entered into the system. Select

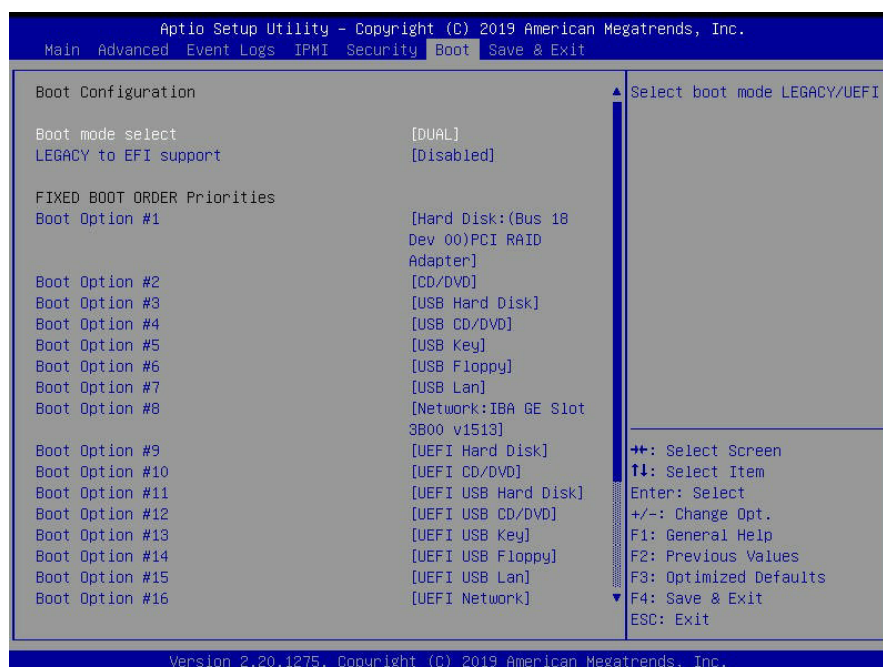
Update to update your "Authorized TimeStamps". Select Append to append your "Authorized TimeStamps". The settings are Update, and Append.

### ► **OsRecovery Signatures**

This feature allows the user to set and save the authorized signatures used for OS recovery. Select Update to update your "OS Recovery Signatures". Select Append to append your "OS Recovery Signatures". The settings are Update, and Append.

## 6.7 Boot Settings

Use this feature to configure Boot Settings:



### Boot Mode Select

Use this feature to select the type of devices from which the system will 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 item sequentially to select devices.

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

- Boot Option #1 - Boot Option #17

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

- Boot Option #1 - Boot Option #8

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

- Boot Option #1 - Boot Option #9

## ▶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.

## ▶UEFI Application Boot Priorities

Use this feature to specify a boot device priority sequence from available UEFI application.

### Boot Option #1

Use this feature to set the system boot order, the options are **UEFI: Built-in EFI Shell** and Disabled.

## ▶Hard Disk Drive BBS Priorities

### Boot option #1

Use this feature to set the system boot order.

## ▶NETWORK Drive BBS Priorities

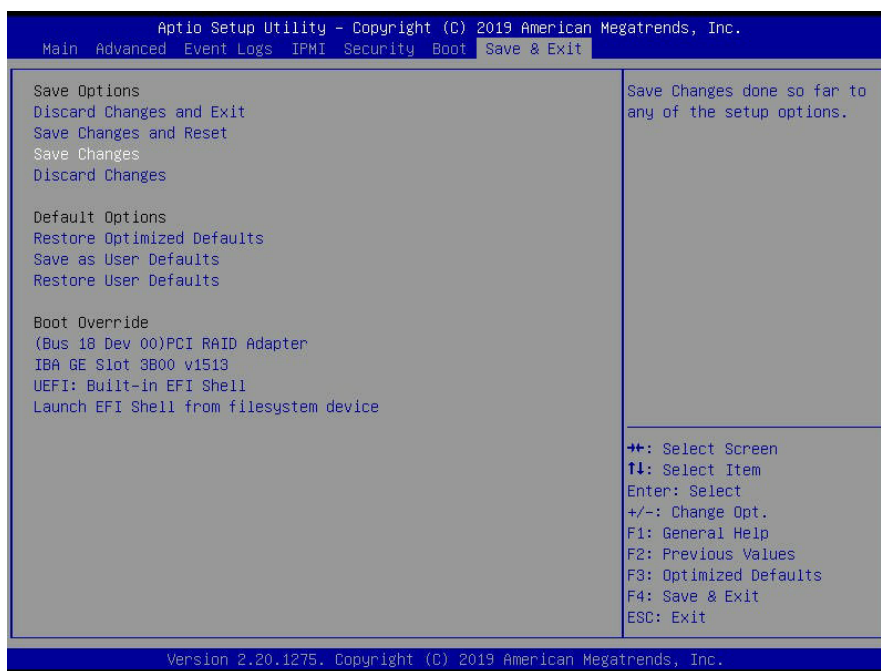
Use this feature to specify a boot device priority sequence from available NETWORK Drives.

### Boot Option #1~#3

Use this feature to set the system boot order.

## 6.8 Save & Exit

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



### Save Options

#### Discard Changes and Exit

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

#### Save Changes and Reset

When you have completed the system configuration changes, select this option to leave the BIOS setup utility and reboot the computer for the new system configuration parameters to become effective.

#### 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 you've made 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 all 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 default 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.

### UEFI: Built-in EFI Shell

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.

### Launch EFI Shell from filesystem device

This feature allows the user to launch EFI Shell application(Shell.efi) from one of the available file system devices.

# Appendix A

## BIOS Error Codes

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

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

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

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

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

BIOS Error Beep (POST) Codes		
Beep Code	Error Message	Description
1 short	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。

此警告符号代表危險。

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

此警告符號代表危險。

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

## Warnung

## WICHTIGE SICHERHEITSHINWEISE

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

BEWAHREN SIE DIESE HINWEISE GUT AUF.

## INSTRUCCIONES IMPORTANTES DE SEGURIDAD

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

GUARDE ESTAS INSTRUCCIONES.

## IMPORTANTES INFORMATIONS DE SÉCURITÉ

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

CONSERVEZ CES INFORMATIONS.

תקנון הזהרות אזהרה

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

اَكْ ف حالة وُكِي اَي تتسبب ف اصابة جسدهُ هذا الزهز عُ خطر! تحذُرُ .  
قبل اَي تعول على اَي هعدات، كي على علن بالوخاطز ال اُجوة عي الذوائر  
الكهزبائِة  
وكي على دراةُ بالووارسات النقاائِة لو عُ وقع اَي حادث  
استخدم رِقن الب اِي الو صُص ف هاةُ كل تحذُرُ للعشر تزجوتها

안전을 위한 주의사항

경고!

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

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

## BELANGRIJKE VEILIGHEIDSINSTRUCTIES

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

BEWAAR DEZE INSTRUCTIES

## Installation Instructions



**Warning!** Read the installation instructions before connecting the system to the power source.

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告

将此系统连接电源前,请先阅读安装说明。

警告

將系統與電源連接前，請先閱讀安裝說明。

Warnung

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

¡Advertencia!

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

Attention

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

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقر إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

Waarschuwing

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

## Circuit Breaker



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

サーキット・ブレーカー

この製品は、短絡(過電流)保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

警告

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

警告

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

### Warnung

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

### ¡Advertencia!

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

### Attention

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

מוצר זה מסתמך על הגנה המותקנת במבנים למניעת קצר חשמלי. יש לוודא 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 المبنى  
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 elektrische 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.

### 電源切斷の警告

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斷され、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 chasis pour installer ou enlever des composants de système.

אזהרה מפני ניתוק חשמלי

אזהרה!

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

يجب فصل انظاؤ من جميع مصادر انطاقت وإزانت سهك انكهرباء من وحدة امداد  
انطاقت قبم  
انصل إلى امناطق انداخهيت نههيكم نتشيج 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せん。

警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

Warnung

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

¡Advertencia!

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

**Attention**

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

אזהרה!

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

والمدربيه لتزكيب واستبدال أو خدمة هذا الجهاز يجب أن يسمح فقط للمظفيه المؤهليه

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**

此装置仅限安装於進出管制區域，進出管制區域係指僅能以特殊工具、鎖頭及鑰匙或其他安全方式才能進入的區域。

### Warnung

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

### ¡Advertencia!

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

### Attention

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

אזור עם גישה מוגבלת

אזהרה!

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

تخصيص هذه انحدة نترك بُها ف مناطق محظورة تم .  
،مكن اننصل إن منطقت محظورة فقط من خلال استخذاو أداة خاصت  
أو أ وس هُت أخري نلالأمما ققم ومفتاح

### 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

電池更換不當會有爆炸危險。請只使用同類電池或制造商推薦的功能相當的電池更換原有電池。請按製造商的說明處理廢舊電池。

### 警告

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

### Warnung

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

### Attention

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

### ¡Advertencia!

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

אזהרה!

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

هناك خطر من انفجار في حالة اسبدال البطارية بطريقة غير صحيحة فعلى  
اسبدال البطارية  
فقط بنفس النوع أو ما يعادلها مما أوصت به الشركة المصنعة  
جخلص من البطاريات المسحومة وفقا لعمليات الشركة الصانعة

경고!

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

Waarschuwing

Er is ontplofingsgevaar 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

此装置连接的电源可能不只一个，必须切断所有电源才能停止对该装置的供电。

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

אזהרה!

ליחידה 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 لعسل الوحدة عن الكهرباء

경고!

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

Waarschuwing

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

## Backplane Voltage



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

### バックプレーンの電圧

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

修理する際には注意ください。

### 警告

当システム正在进行时，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，背板上危險的電壓或能量，進行維修時務必小心。

### Warnung

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

### ¡Advertencia!

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

### Attention

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

מתח בפנל האחורי

אזהרה!

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

هناك خطر من التيار الكهربائي أو الطاقة المتجددة على اللوحة  
عندما يكون 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 instalación del equipo debe cumplir con las normas de electricidad locales y nacionales.

Attention

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

תיאום חוקי החשמל הארצי

אזהרה!

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمتثل للقوايه المحلية والبطية المتعلقة  
بالكهرباء

경고!

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

Waarschuwing

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

## Product Disposal



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

製品の廃棄

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

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

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

¡Advertencia!

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

## Attention

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

סילוק המוצר

אזהרה!

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

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

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 נעים מסוכנים. התרחק מלהבי המאוורר בפעולה כאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאווררים עדיין עובדים. יש להרחיק למרחק בטוח את האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

تحذير! أجزاء متحركة خطيرة. ابتعد عن شفرات المروحة المتحركة. من الممكن أن المراوح لا تزال تدور عند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع ومفكات البراغي وغيرها من الأشياء بعيدا 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 Adapter 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 securite y compris les tailles de cables et les prises electriques appropries. 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 ומתאמי

אזהרה!

אשר נרכשו או הותאמו לצורך ההתקנה, ואשר הותאמו לדרישות AC כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתאמים הבטיחות המקומיות, כולל מידה נכונה של הכבל והתקע. שימוש בכל כבל או מתאם מסוג אחר, עלול לגרום לתקלה או קצר חשמלי. בהתאם כאשר מופיע עליהם קוד) UL-CSA או ב UL - לחוקי השימוש במכשירי החשמל וחוקי הבטיחות, קיים איסור להשתמש בכבלים המוסמכים ב Supermicro עבור כל מוצר חשמלי אחר, אלא רק במוצר אשר הותאם ע"י UL/CSA של

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

#### 전원 케이블 및 AC 어댑터

경고! 제품을 설치할 때 현지 코드 및 적절한 굵기의 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

Dual 2nd Generation Intel Xeon Scalable processors in a Socket P type socket (Intel Xeon Gold 6244, 6246 and 6254 for -LL1, -LL2, and -LL3, respectively)

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

### Chipset

Intel C621 chipset

### BIOS

32Mb AMI® Flash ROM

### Memory

Sixteen DIMM slots to support up to 4TB of ECC, DDR4-2666/2400 Registered DIMM (RDIMM) memory

**Note:** Twelve 16GB DIMMs have been pre-installed in the system. See the memory section in Chapter 5 for details and our website for updates to supported memory.

### SATA Controller

Intel C621 controller

### Drive Bays

Ten 2.5" hot-swap drive bays

### PCI Expansion Slots (supported)

Two PCI-E 3.0 x16 slots (with included riser card)

One PCI-E 3.0 x8 (with included riser card)

### Motherboard

X11DPU-XLL; ATX form factor (17 x 16.8 in. / 432 x 427 mm.)

### Chassis

SC119UTS-R751P; 1U rackmount, 17.2 x 1.7 x 27.8 in. (437 x 43 x 706 mm) (W x H x D)

### System Cooling

Eight 4-cm counter-rotating PWM fans

### Power Supply

Model: PWS-751P-1R

AC Input Voltages: 100-240 VAC

Rated Input Current: 9.5-4.5A

Rated Input Frequency: 50-60 Hz

Rated Output Power: 750W

Rated Output Voltages: +12V, +12Vsb (2A)

### Operating Environment

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

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

Operating Relative Humidity: 8% to 90% (non-condensing)

Non-operating Relative Humidity: 5% to 95% (non-condensing)

### Regulatory Compliance

Electromagnetic Emissions: FCC Class A, EN 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)

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, Delegated Directive (EU) 2015/863 and Directive 2012/19/EU

**Regulatory Compliance**

FCC, ICES, CE, VCCI, RCM, UKCA, NRTL, CB

**Applied Directives, Standards**

EMC/EMI: 2014/30/EU (EMC Directive)

FCC Part 15 Subpart B

ICES-003

VCCI-CISPR 32

AS/NZS CISPR 32

EN/BS EN55032

CISPR 32

EN/BS 61000-3-2

EN/BS 61000-3-3

EN/BS 61000-4-2

EN/BS 61000-4-3

EN/BS 61000-4-4

EN/BS 61000-4-5

EN/BS 61000-4-6

EN/BS 61000-4-8

EN/BS 61000-4-11

Green Environment:

2011/65/EU (RoHS Directive)

EC 1907/2006 (REACH)

2012/19/EU (WEEE Directive)

California Proposition 65

Product Safety: 2014/35/EU (LVD Directive)

UL/CSA 60950-1 2nd Edition

UL/CSA 62368-1 (USA and Canada)

IEC/EN 62368-1

IEC 60950-1 2nd Edition

**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)"

この装置は、クラスA機器です。この装置を住宅環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

**VCCI – A**

## 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 do 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/nfo/SMS\\_SUM.cfm](https://www.supermicro.com.tw/products/nfo/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.

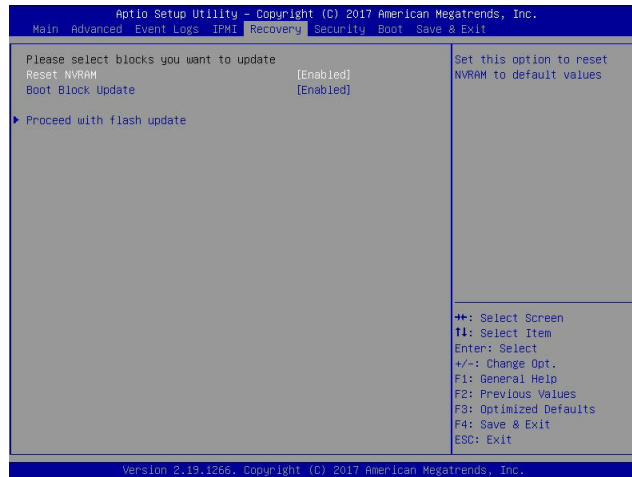
**Note 1:** If you cannot locate the "Super.ROM" file in your drive disk, visit our website at [www.supermicro.com](http://www.supermicro.com) to download the BIOS package. Extract the BIOS binary image into a USB flash device and rename it "Super.ROM" for the BIOS recovery use.

**Note 2:** Before recovering the main BIOS image, confirm that the "Super.ROM" binary image file you download is the same version or a close version meant for your motherboard.

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.



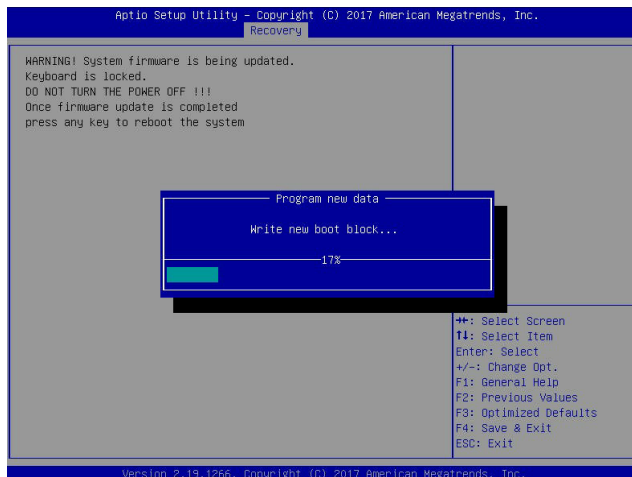
3. After locating the healthy BIOS binary image, the system will enter the BIOS Recovery menu as shown below.



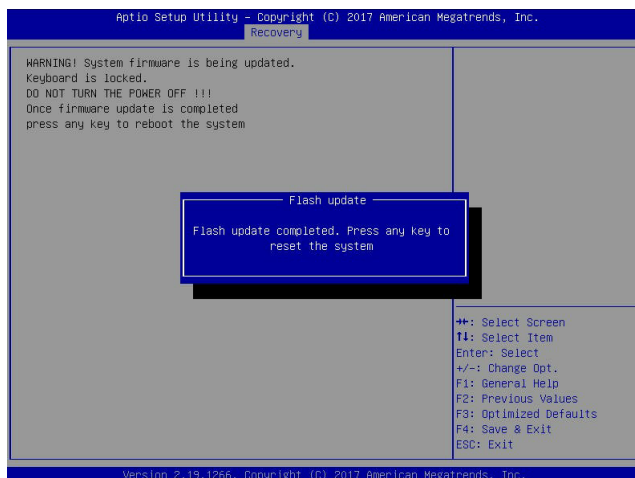
**Note:** At this point, you may decide if you want to start the BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.

4. 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.

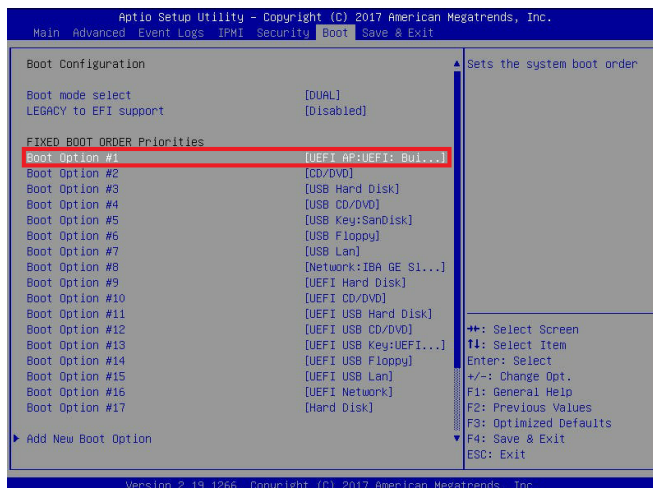
**Note:** Do not interrupt the BIOS flashing process until it has completed.



- 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.
- 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.



- 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.

```

UEFI Interactive Shell v2.1
EDK II
UEFI v2.50 (American Megatrends, 0x0005000C)
Mapping table
  FS0: Alias(s):HD0:0B:BLK1:
      PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)/HD(1,MBR,0x3791072,0x800,0x1
CR959C)
  BLK0: Alias(s):
      PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)
Press F8 in 1 seconds to skip startup.nsh or any other key to continue.
Shell> fs0:
FS0:\> cd AFUDOS
FS0:\AFUDOS> cd SNIJPE2_03162017
FS0:\AFUDOS\SNIJPE2_03162017> flash.nsh X110PU7_314
    
```

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

```

Done.
[ Access Cmos Port Ex ]
<Read>
Index 0x51: 0x10

Done.
*****
* Program BIOS and ME (including FDT) regions...
*****
| AMT Firmware Update Utility v5.09.01.1917 |
| Copyright (C)2017 American Megatrends Inc. All Rights Reserved. |
-----
CPUID = 50652

Reading flash ..... done
- ME Data Size checking - ok
- FFS checksums ..... ok
- Check RomLayout ..... Ok
Erasing Boot Block ..... done
Updating Boot Block ..... done
Verifying Boot Block ..... done
Erasing Main Block ..... 0x00132000 (0x)
    
```

- 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.

```

Verifying NDB Block ..... done
- Update success for FDR
+ Update success for IE
- Successful Update Recovery Loader to OPRx11
- Successful Update MFSB11
- Successful Update FPR11
- Successful Update MFS, IVBI and IVB211
- Successful Update FLOG and UTDK11
- ME Entire Image update success !!
WARNING : System must power-off to have the changes take effect!
Moving FS0:\AFUDOS\SNIJPE2_03162017\Fdtv64.efi -> FS0:\AFUDOS\SNIJPE2_03162017\F
dt1.smc
- [ok]
Moving FS0:\AFUDOS\SNIJPE2_03162017\Fuef1x64.efi -> FS0:\AFUDOS\SNIJPE2_0316201
7\Fuef1.smc
- [ok]
*****
* Please ignore this 'Shell: Cannot read from file - Device Error'
* warning message due to it does not impact flashing process.
*****
Deleting "FS0:\AFUDOS\SNIJPE2_03162017\Fuef1.smc"
Delete successful.
FS0:\>
    
```

- Press `<Del>` continuously to enter the BIOS Setup utility.
- Press `<F3>` to load the default settings.
- After loading the default settings, press `<F4>` to save the settings and exit the BIOS Setup utility.

# Appendix E

## CPU-Based RAID for NVMe

Intel® Virtual RAID on CPU (Intel VROC) is an enterprise RAID solution for NVMe SSDs directly attached to Intel Xeon Scalable processors. Intel Volume Management Device (VMD) is an integrated controller inside the CPU PCI-E root complex.

- A single processor supports up to 12 NVMe SSDs and up to 6 RAID arrays.
- A dual processor system supports up to 24 NVMe SSDs and 12 RAID arrays.

Strip sizes are 4K, 8K, 16K, 32K, 64K, 128K.

### Requirements and Restrictions

- **Intel VROC is only available when the system is configured for UEFI boot mode.**
- To enable the `mdadm` command and support for RSTe, install the patch from
  - Linux: <https://downloadcenter.intel.com/download/28158/Intel-Virtual-RAID-on-CPU-Intel-VROC-and-Intel-Rapid-Storage-Technology-enterprise-Intel-RSTe-Driver-for-Linux->
  - Windows: <https://downloadcenter.intel.com/download/28108/Intel-Virtual-RAID-on-CPU-Intel-VROC-and-Intel-Rapid-Storage-Technology-enterprise-Intel-RSTe-Driver-for-Windows->
- To enable Intel VROC, a hardware key must be inserted on the motherboard, and the appropriate processor's Virtual Management Devices must be enabled in the BIOS setup.
- It is possible to enable Intel VROC without a hardware key installed, but only RAID0 will be enabled.
- Intel VROC is not compatible with secure boot. This feature must be disabled.
- When creating bootable OS RAID1 devices, you must have both devices on the same CPU, and a VMD on that CPU.
- Spanning drives when creating RAID devices is not recommended due to performance issues, even though it is supported.

### Supported SSDs and Operating Systems

To see the latest support information: <https://www.intel.com/content/www/us/en/support/articles/000030310/memory-and-storage/ssd-software.html>

## Additional Information

Additional information is available on the product page for the Supermicro add-on card and the linked manuals.

[www.supermicro.com/products/accessories/addon/AOC-VROCxxxMOD.cfm](http://www.supermicro.com/products/accessories/addon/AOC-VROCxxxMOD.cfm)

## E.1 Hardware Key

The Intel VROC hardware key is a license key that detects the Intel VROC SKU and activates the function accordingly. The key must be plugged into the Supermicro motherboard (connector JRK1). The key options are:

Intel® VROC Keys			
VROC Package	Description	Part Number	Intel MM Number
Standard	RAID 0, 1, 10 Supports 3rd party SSDs	AOC-VROCSTNMOD	951605
Premium	RAID 0, 1, 5, 10 Supports 3rd party SSDs	AOC-VROCPREMOD	951606
Intel SSD only	RAID 0, 1, 5, 10 Supports Intel SSDs only	AOC-VROCINTMOD	956822

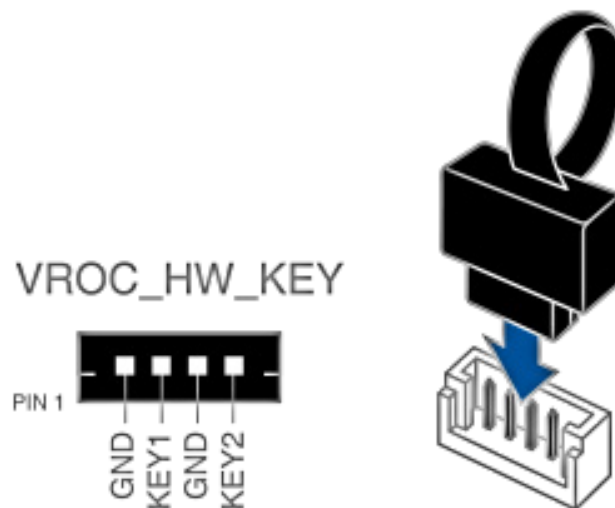


Figure E-1. Intel® VROC RAID Key and Motherboard Connector JRK1

## E.2 Enabling NVMe RAID

RAID for NVMe SSDs must be enabled through the UEFI BIOS.

1. Install the patch as described in the Restrictions and Requirements section on a previous page.
2. Reboot the server.
3. Press [DEL] key to enter BIOS.
4. Switch to **Advanced > Chipset Configuration > North Bridge > IIO Configuration > Intel® VMD Technology > CPU1 & CPU2**.
5. **Enable** the VMD according to the following rules.
  - For U.2 NVMe, enable all the sub-items under each PStack, based on the your model server:

VMD BIOS Setting for SYS-1029UX-LL1-C16/LL2-C16/LL3-C16	
CPU1	CPU2
VMD Config for PStack0	VMD Config for PStack1

- For M.2 NVMe or NVMe AIC, enable the VMD according to which AOC card/slot it used.

An example U.2 configuration follows.

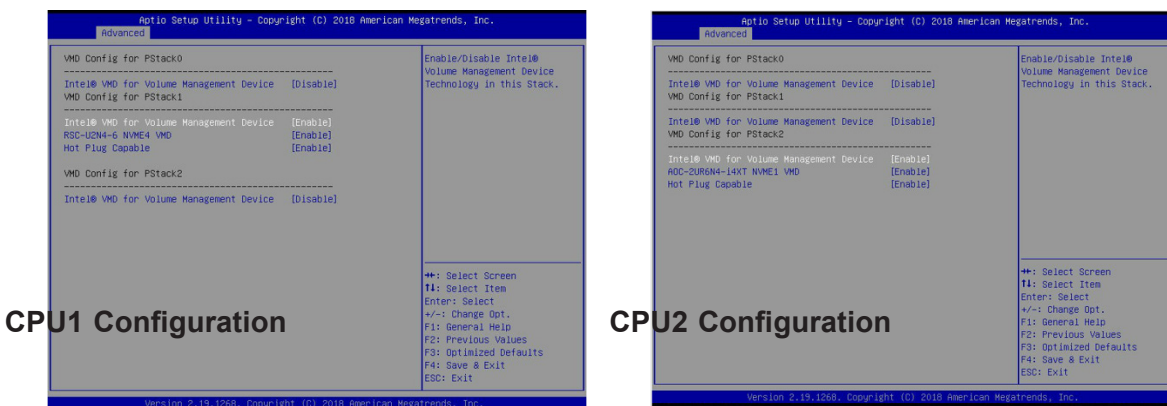
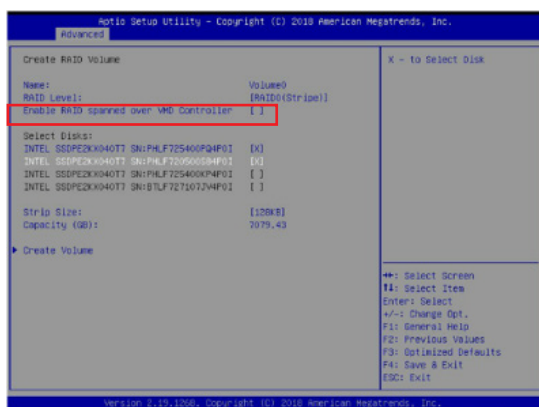
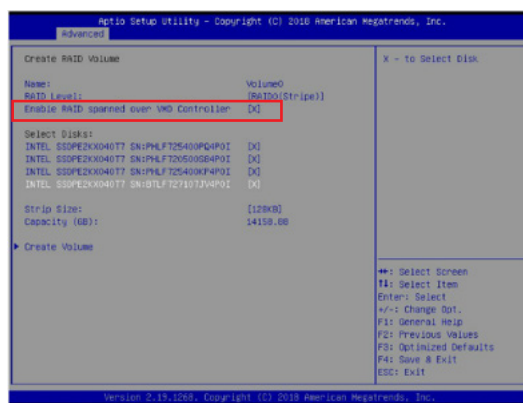


Figure E-2. BIOS VMD Setting Example for 24 Drives

6. Press [F4] to save the configuration and reboot the system.
7. Press [DEL] to enter BIOS.
8. Switch to **Advanced > Intel® Virtual RAID on CPU > All Intel VMD Controllers > Create RAID Volume**.
9. Set **Name**.
10. Set **RAID Level**.
11. If cross-controller RAID is required, select **Enable RAID spanned over VMD Controller** as shown in Figure F-4.



**Figure E-3. Created Volume *without* enabling RAID spanned over VMD controller**



**Figure E-4. Created Volume *with* enabling RAID spanned over VMD controller**

12. Select specific disks for RAID with an [X].
  - RAID0: Select at least two [2 - 24] disks
  - RAID1: Select only two disks
  - RAID5: Select at least three [3 - 24] disks
  - RAID10: Select only four disks
13. Select **Strip Size** (Default 64KB).
14. Select **Create Volume**.
15. If another RAID is needed, start again at step 6.
16. Press [F4] to save and reboot.

## E.3 Status Indications

An LED indicator on the drive carrier shows the RAID status of the drive.

Drive Carrier Status LED Indicator	
Status	State (red)
Normal function	Off
Locating	4 Hz blink
Fault	Solid on
Rebuilding	1 Hz Blink

IBPI SFF 8489 Defined Status LED States

## E.4 Hot Swap Drives

Intel VMD enables hot-plug and hot-unplug for NVMe SSDs, whether from Intel or other manufacturers. Under vSphere ESXi, several steps are necessary to avoid potential stability issues. See the information at link [1] below.

### Hot-unplug

1. Prevent devices from being re-detected during rescan:

```
esxcli storage core claiming autoclaim --enabled=false
```

2. Unmount the VMFS volumes on the device. Check [2] for details.
3. Detach the device. Check [3] for details.
4. Physically remove the device.

### Hot-plug

- Physically install the device.

ESXi will automatically discover NVMe SSDs, but a manual scan may be required in some cases.

### Related Information Links

[1] <https://kb.vmware.com/s/article/2151404>

[2] <https://docs.vmware.com/en/VMware-vSphere/6.5/com.vmware.vsphere.storage.doc/GUID-1B56EF97-F60E-4F21-82A7-8F2A7294604D.html>

[3] <https://docs.vmware.com/en/VMware-vSphere/6.5/com.vmware.vsphere.storage.doc/GUID-F2E75F67-740B-4406-9F0C-A2D99A698F2A.html>